WELCOME

Driving openEHR successfully with MongoDB

openEHR Conference. Barcelona, June 6, 2023

Francesc Mateu
Healthcare Principal, Industry Solutions

MongoDB, the perfect fit for healthcare data (and openEHR)

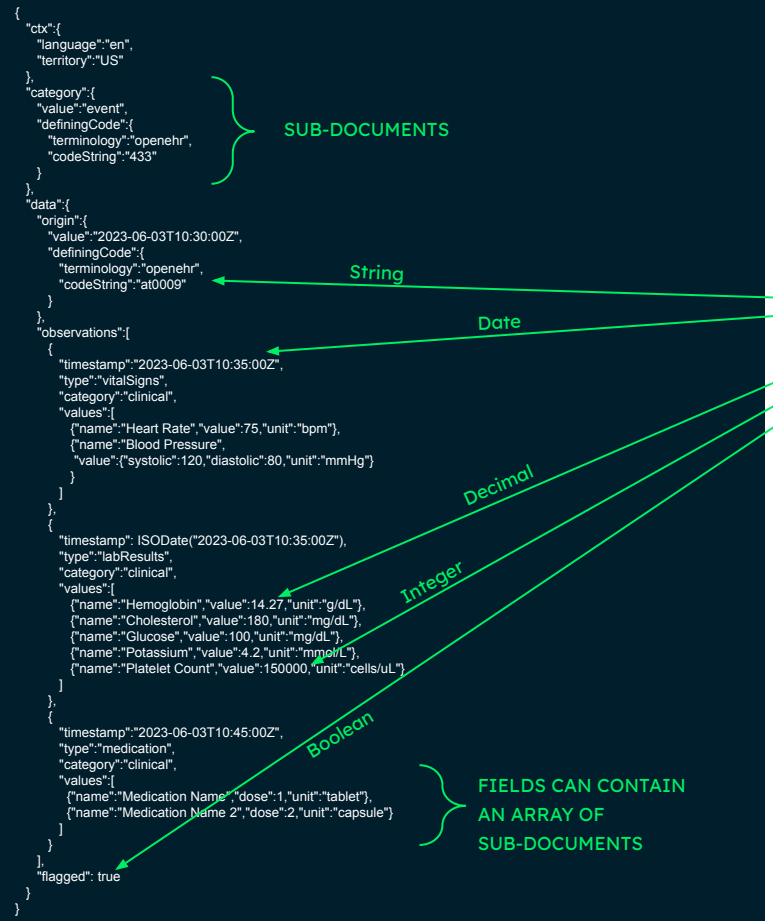
Document Model

MongoDB's document data model is ideal for managing healthcare data

JSON format

MongoDB's document data model allows you to save and retrieve data in JSON format directly in the database

Rich documents for openEHR data



Supports Nested and Hierarchical Data Structures

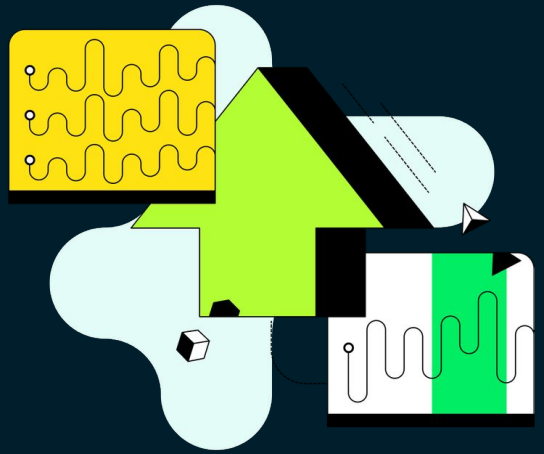
Making it easier to represent complex clinical data with varying levels of detail and granularity

Flexibility

Fields can vary from document to document, and the same document can store data representing different standards and formats

Scalability & Availability

Dealing with large healthcare datasets can be challenging for traditional relational database systems

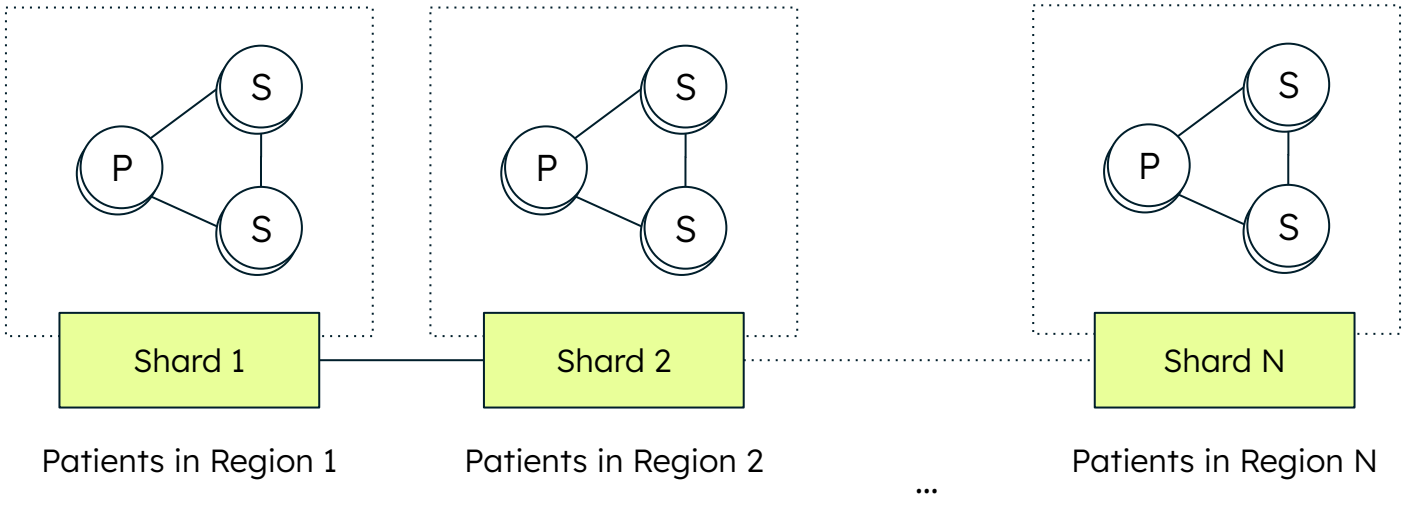


Horizontal Scaling

Easily distribute data across multiple servers, allowing for greater processing power and faster query times.

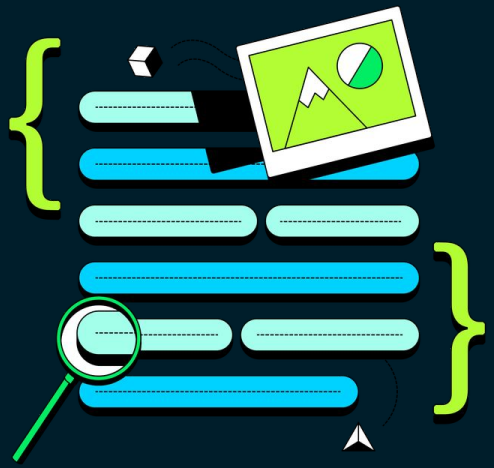
Improved Reliability

By adding more servers or nodes to the system, reducing the risk of a single point of failure.


S
P
S
S
P
S
S
P
S
Shard 1
Shard 2
Shard N
Patients in Region 1
Patients in Region 2
...
Patients in Region N

Unrivaled Query Performance

MongoDB's advanced querying capabilities make it a standout solution for healthcare applications



Optimized for Storage and Retrieval

Allowing to quickly and efficiently read and write data using an expressive query language and aggregation framework.

Handling Complex Queries with Multiple Fields

Specially useful for CDRs, which permit almost unlimited querying flexibility

Efficient Querying Across Vast Data Sets

With MongoDB Atlas' Lucene indexing

The Developer Data Platform

Today, a company's competitive advantage is tied to how well they **build software using their most important asset**—data

Competitive advantage cannot be bought

Need to enable sustainable innovation

70% of enterprises fail in their digital transformation initiatives

— BCG (2020)

Why?

Working with data
has always been the hardest part of building & evolving applications

And even more importantly…

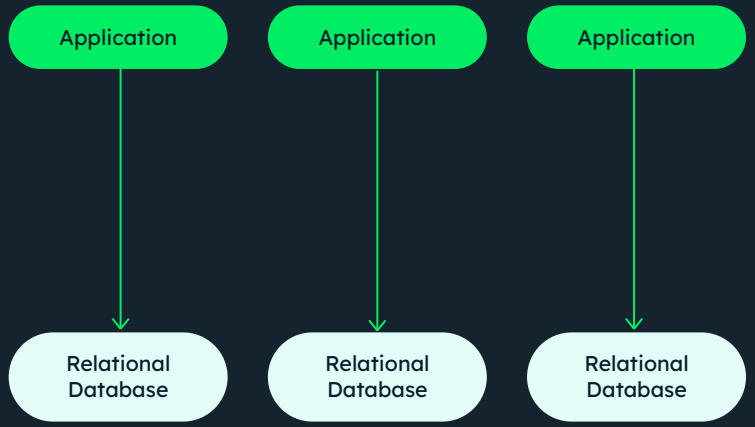
How we use data to build applications has changed, but the typical data infrastructure is built on a 40 year old foundation

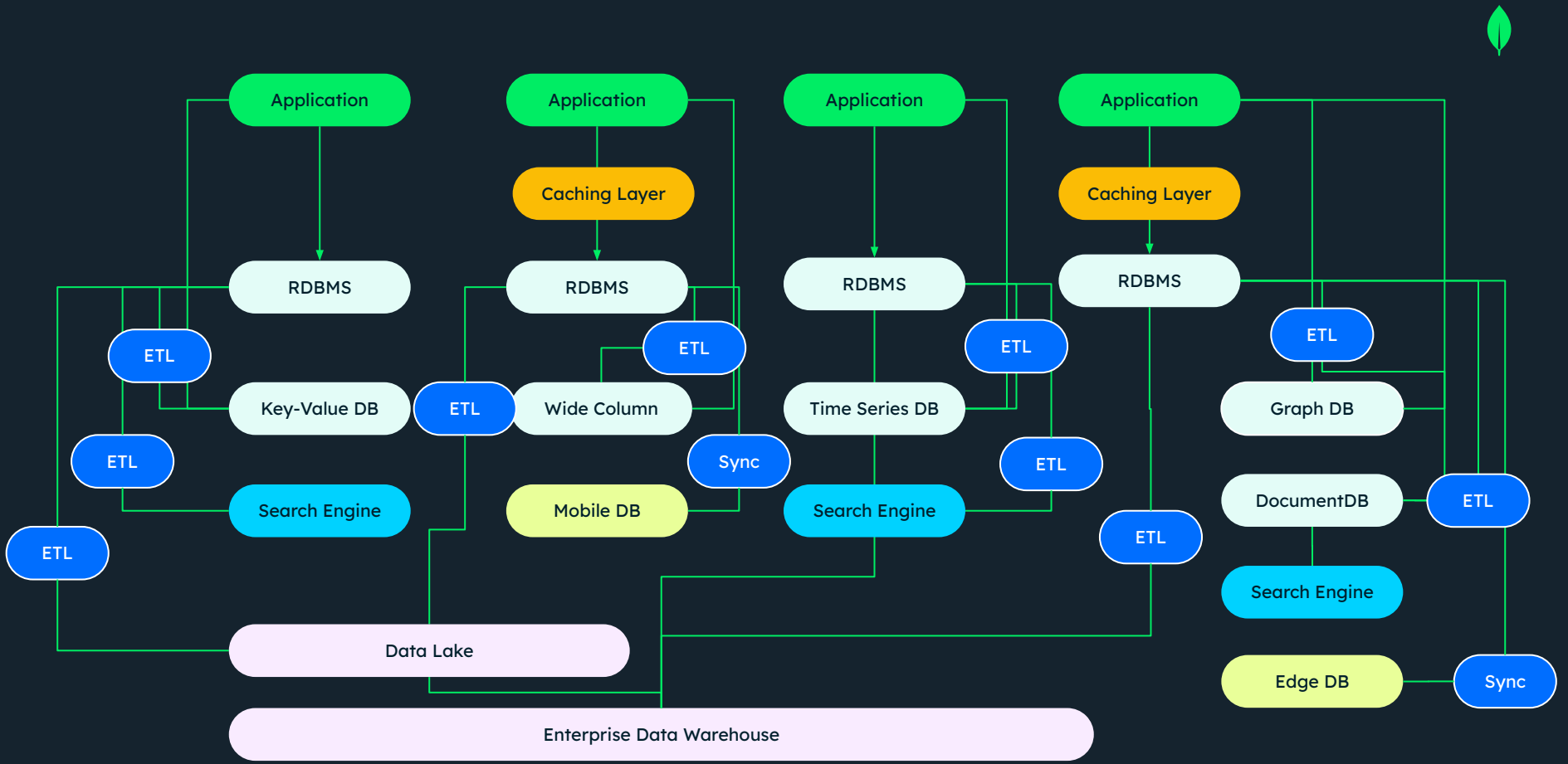
Because the typical data infrastructure is still built around legacy relational databases

Relational databases are optimized to solve a different set of problems

Data structures clash with modern data and the objects developers work with

Rigidity makes experimenting and iterating on applications difficult




Application
Application
Application
Application
Caching Layer
Caching Layer
RDBMS
RDBMS
RDBMS
RDBMS
ETL
ETL
ETL
ETL
ETL
Key-Value DB
ETL
Wide Column
Time Series DB
Graph DB
ETL
Sync
ETL
ETL
Search Engine
Mobile DB
Search Engine
DocumentDB
ETL
ETL
Search Engine
Data Lake
Edge DB
Sync
Enterprise Data Warehouse

Fragmented developer experience

Multiple operational and security models to rationalize

Significant data integration effort required

Unnecessary data duplication

This data architecture complexity creates a tax on innovation — a **Data & Innovation Recurring Tax (DIRT)**.

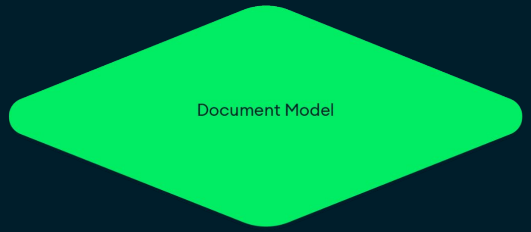
To eliminate this tax on innovation, companies need a data platform for building applications.

This developer data platform must have 3 major attributes...

Built around the most intuitive way to model data — the document data model

Document data model maps to how modern developers think & code

Documents are inherently flexible while allowing data governance when required



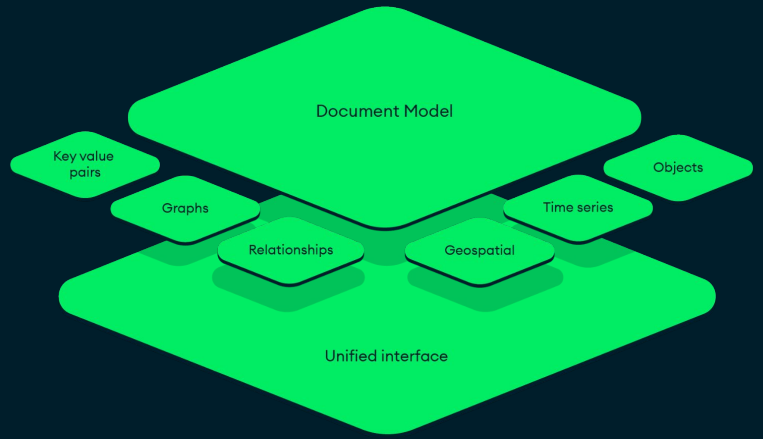
Built around the most intuitive way to model data — the document data model

Document data model maps to how modern developers think & code

Documents are inherently flexible while allowing data governance when required

Documents can address a wide variety of use cases and can be used to model both structured & “semi-structured” data

IE: Time series collections for IoMT

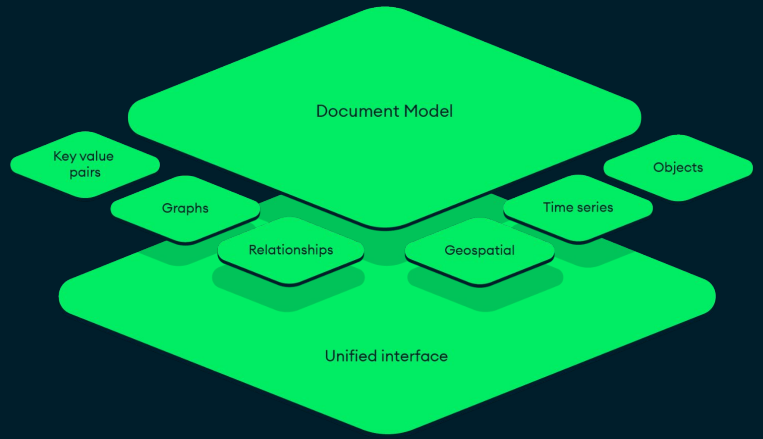


Unified query interface for a broad set of workload types

Strongly consistent by default with support for multi-document ACID transactions.

Cutting edge and comprehensive controls to ensure data security and privacy

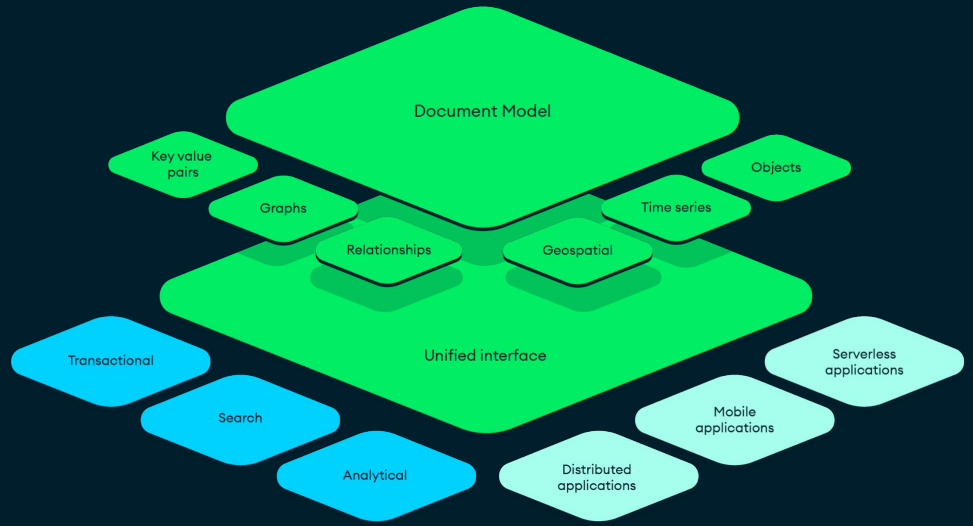
Scalability and high availability ensuring performance at scale.



Support a wide range of modern application types as they grow and evolve

A single and consistent way to work with data:

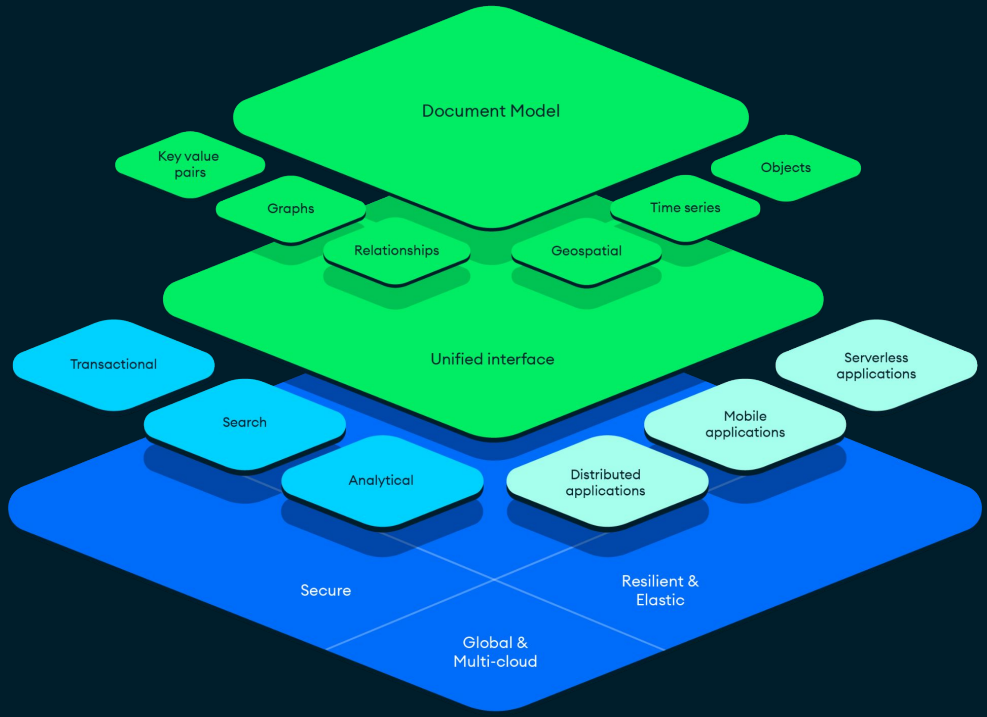
- Built-in full text search
- Build offline-first mobile apps
- Operational analytics:
  - Rich aggregations
  - Use Atlas Charts to visualize your data
  - Event-driven architecture
  - Accelerate AI and ML workflows



Built on a battle-tested platform that allows you to run anywhere

Deploy in over 100+ regions across 3 cloud providers. Deploy across clouds to get the best from each provider with no lock-in.

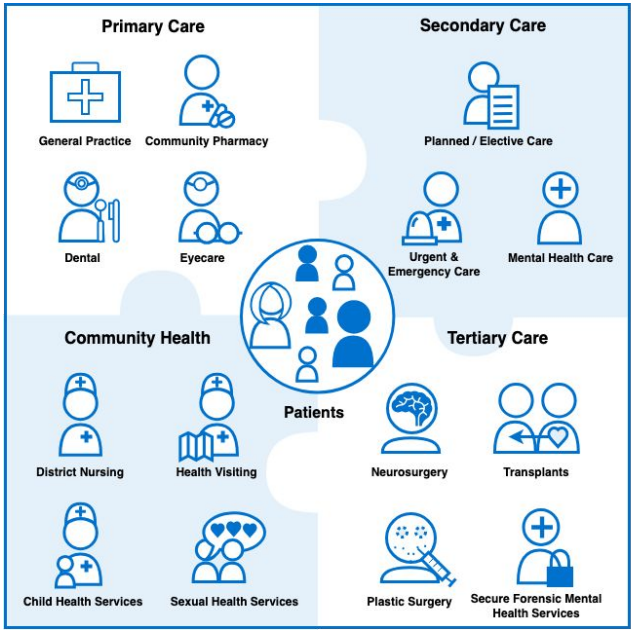
Develop onPrem, ensuring future cloud-ready solutions



Radical interoperability

DATA FRAGMENTATION

Complex inside and outside



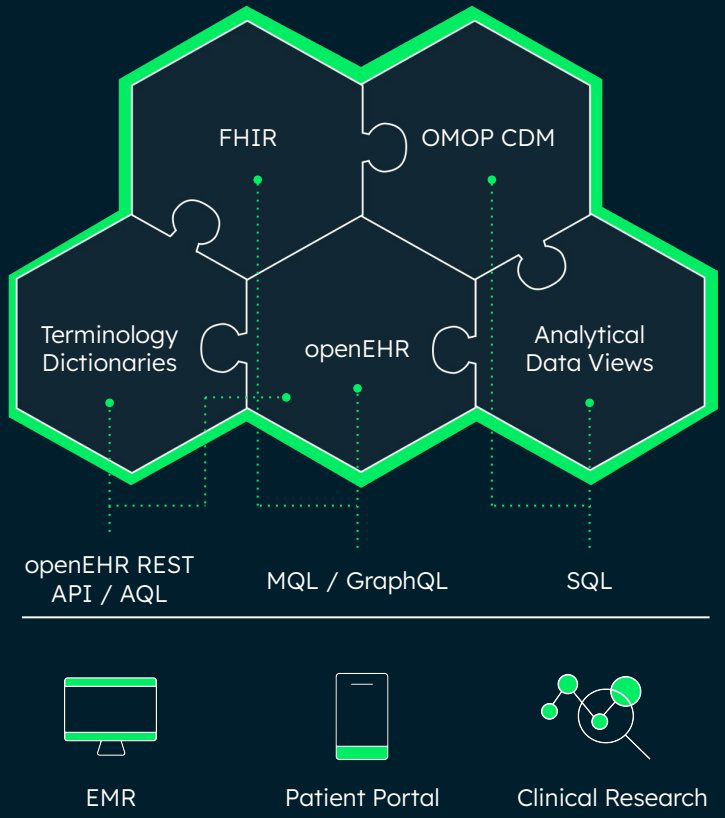
NHS healthcare ecosystem

MongoDB aligns with openEHR vision

Powered by

Own your Data at Storage Layer

Storage of your data remains independent of the clinical data model you use



Healthcare institutions around the world are using MongoDB to **increase agility**, **velocity**, and **their speed of innovation**.

Thank you!