ARCHITECTURE & DATA FLOW

Sources   Ingestion Layer   MongoDB Lake

IndexedDB
(Field Tablets)

Neo4j
(Graph of Farms,
Devices, Readings)

Node.js

Metadata Tagging
- sourceDB
- ingestedAt
- tags

**Lake
Collection**
Raw Documents

Query & Analytics
- MongoDB Compass
- MQL Filters &
  Aggregations
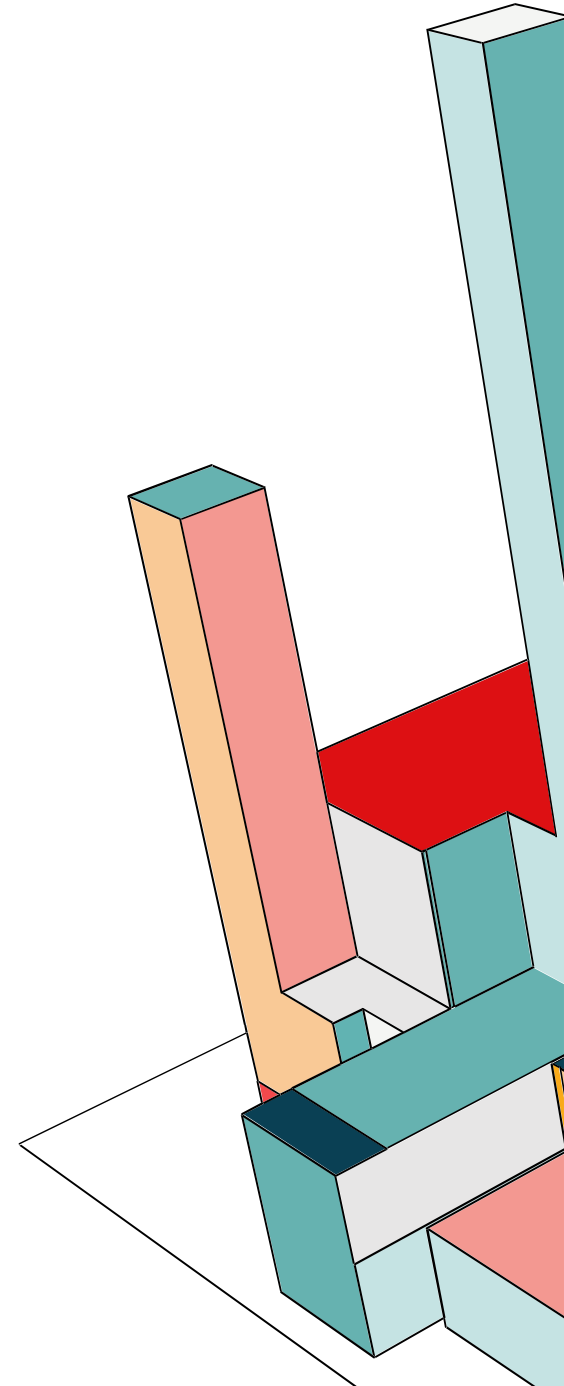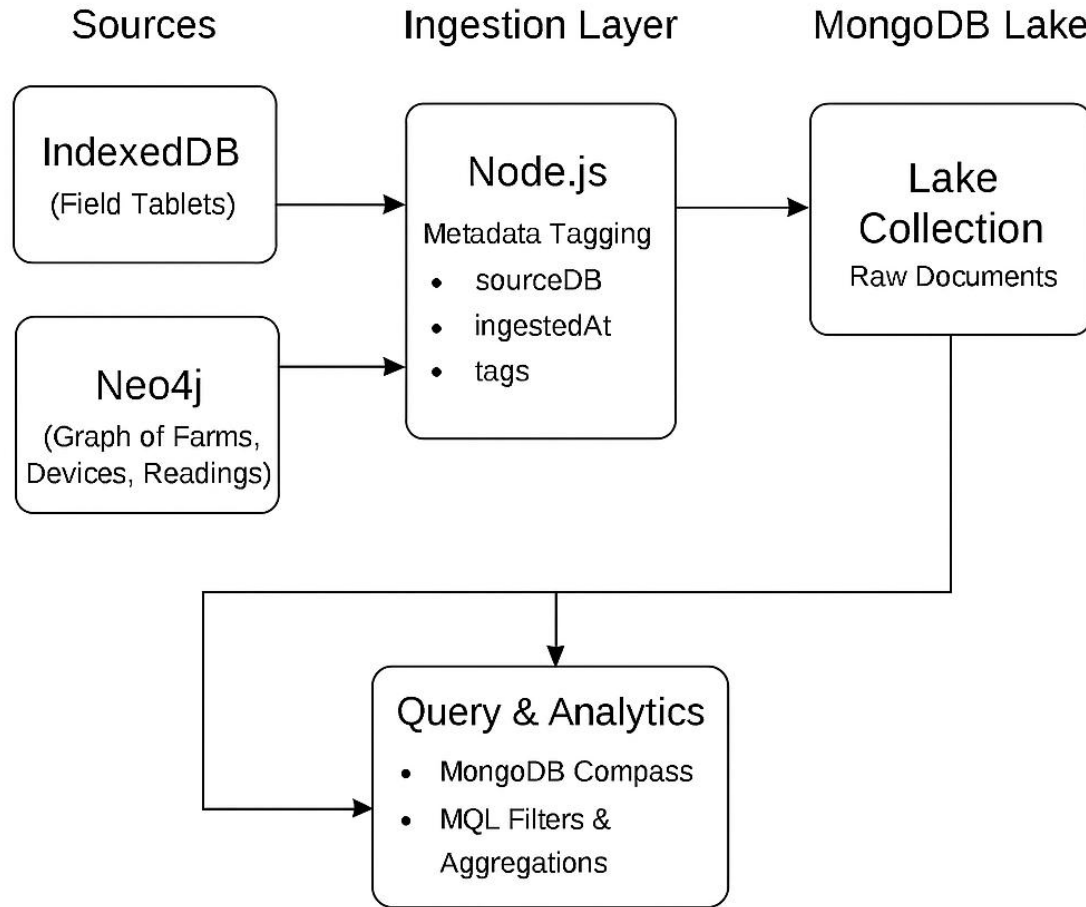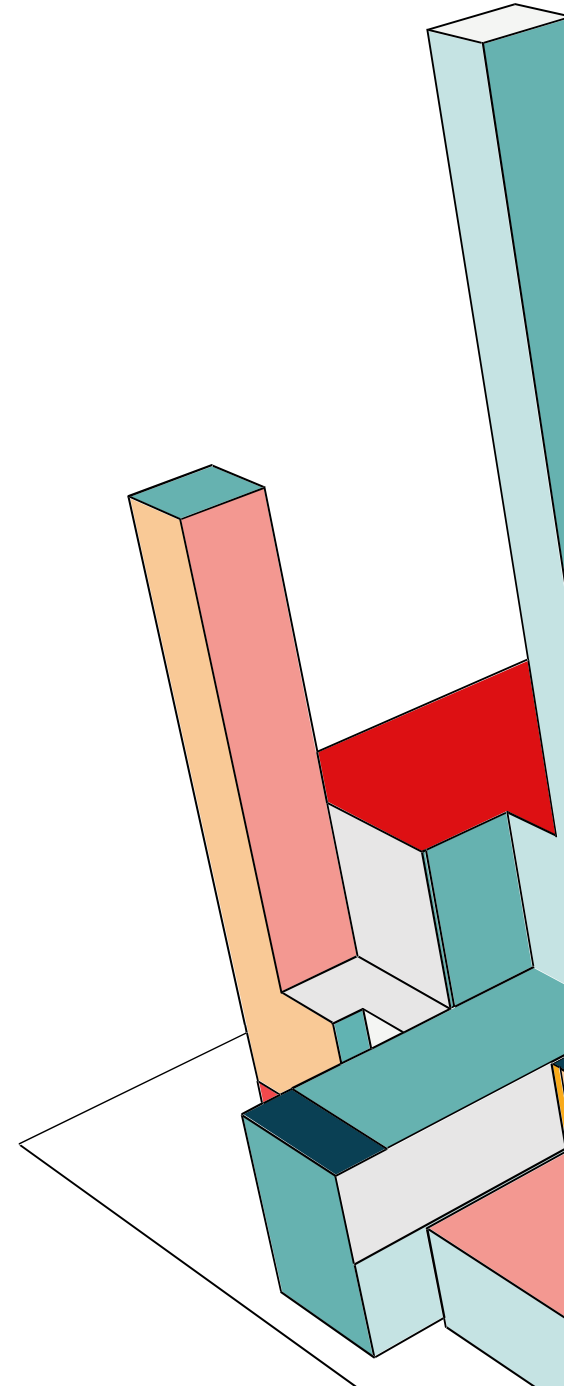
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LESSONS LEARNED

- IndexedDB required custom extraction logic due to browser constraints.

- Neo4j integration was smooth using the official driver and Cypher queries.

- Metadata tagging (sourceDB, ingestedAt, tags) helped unify documents across sources.

- Console.table formatting made debugging and validation easier.

- Using .env for MongoDB Atlas credentials improved portability and security.

CHALLENGES & REFLECTIONS

What Worked Well:

• IndexedDB → MongoDB mapping using Express + JavaScript

• Neo4j → MongoDB mapping using Cypher + JavaScript

• Compass queries for validation

• Modular ingestion functions for each source

What Didn't Work Well:

• Sync IndexedDB & Neo4j at the same time

• Neo4j schema mismatches required manual cleanup

Reflection:

Hybrid pipelines require careful metadata design and consistent schema enforcement to avoid downstream confusion.