# LAB 3

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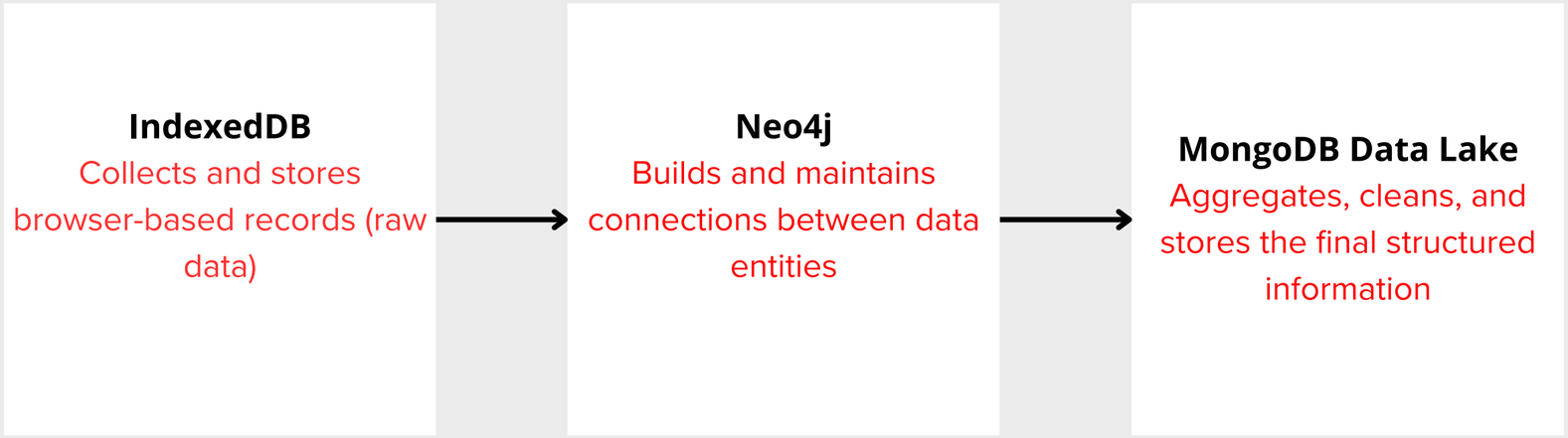
## ARCHITECTURE & DATA FLOW

- IndexedDB: Captures and stores client-side data directly within the browser environment.
- Neo4j: Represents the relationships between farms, devices, and readings through a graph structure.
- MongoDB Data Lake: Functions as the unified storage system for organized and processed datasets.

## WORKFLOW

- Retrieve data from IndexedDB.
- Map and relate entities through Neo4j's graph model.
- Transfer the refined and structured data into MongoDB Data Lake for large-scale analytics.



# LESSONS LEARNED FROM EXTENDING YOUR PIPELINE:

**01**

Data Integration Complexity

- Lesson: Combining data from different sources (IndexedDB + Neo4j) requires careful schema mapping
- Key Takeaway: Each database has unique structures that need transformation for unified storage

**02**

Error Handling Matters

- Lesson: Database connections can fail, so proper error handling prevents data loss
- Key Takeaway: Always implement try-catch blocks and connection cleanup

**03**

MongoDB Query Flexibility

- Lesson: MongoDB's flexible schema allows storing diverse data structures in one collection
- Key Takeaway: NoSQL databases excel at handling heterogeneous data from multiple sources

# CHALLENGES - WHAT WORKED WELL? WHAT DID NOT WORK WELL?

01

**What Worked Well**

- Go API Integration Layer: Functioned as a reliable single endpoint for both databases.
- Connection Management: Handled multiple clusters effectively without major issues.
- Metadata Automation: Automatically added tags and maintained data consistency.
- RESTful Design: Simplified API testing with clear and well-structured endpoints.

02

**Challenges Faced**

- Data Model Conversion: Mapping graph data (Neo4j) to document data (MongoDB) was complex.
- Cross-System Debugging: Difficult to trace errors due to multiple connected systems.
- Startup Timing Dependencies: Required precise sequence during service initialization.
- Network Configuration: Encountered CORS and multi-cluster setup issues.