**Data Migration Report: MySQL Workbench to MongoDB Compass**

# Introduction

This report outlines the data migration process from MySQL Workbench to MongoDB Compass, detailing the steps taken, challenges faced, and solutions implemented. The goal was to migrate structured relational data into a NoSQL document-based database while ensuring data integrity and minimal downtime.

# Objectives

* Successfully migrate data from MySQL Workbench to MongoDB Compass.
* Ensure data integrity and consistency.
* Optimize data structures for NoSQL.
* Minimize downtime and ensure application continuity.

# Migration Plan

## Pre-Migration Analysis

* Identified MySQL Workbench database schemas, tables, and relationships.
* Defined MongoDB Compass collection structures based on data normalization.
* Selected migration tools and scripting approach.

## Tools Used

* **MySQL Workbench** – For database management and data extraction.
* **MongoDB Compass** – For data visualization and validation.
* **Python Script with PyMySQL & PyMongo** – For data transformation and insertion.
* **MongoDB Import (mongoimport)** – For bulk insertion.

# Migration Process

## Data Extraction from MySQL Workbench

* Used MySQL Workbench to export data from MySQL tables.
* Extracted data using Python scripts and stored it in JSON format for compatibility with MongoDB Compass.

mysqldump -u root -p --databases mydatabase > mydatabase.sql

## Data Transformation

* Converted relational tables into MongoDB Compass-compatible JSON documents.
* Flattened normalized tables where necessary.
* Maintained relationships using embedded documents and references.

## Data Insertion into MongoDB Compass

• Inserted transformed JSON data into MongoDB Compass collections using mongoimport and Python scripts.

mongoimport --db mydatabase --collection mycollection --file data.json -jsonArray

# Challenges and Solutions

**Challenge Solution**

Handling relational data Used embedding and referencing based on data access patterns

Large dataset performance Used batch inserts and indexing in MongoDB Compass

Data type mismatches Converted MySQL data types to appropriate BSON types

# Validation & Testing

* Verified record count between MySQL Workbench and MongoDB Compass.
* Sampled random records to ensure data integrity.
* Queried MongoDB Compass collections to test structure and relationships.

# Performance Improvements

* Indexed frequently queried fields.
* Optimized MongoDB Compass schema for fast retrieval.
* Reduced redundant data using document embedding.

# Conclusion & Next Steps

The migration from MySQL Workbench to MongoDB Compass was successfully completed with data integrity and performance optimizations. Future steps include monitoring MongoDB Compass performance, further indexing, and optimizing queries for application use.

**End of Report**