Designing Advanced Data Architectures for Business Intelligence
Dimension Modeling

Name – Krisha Lakhani
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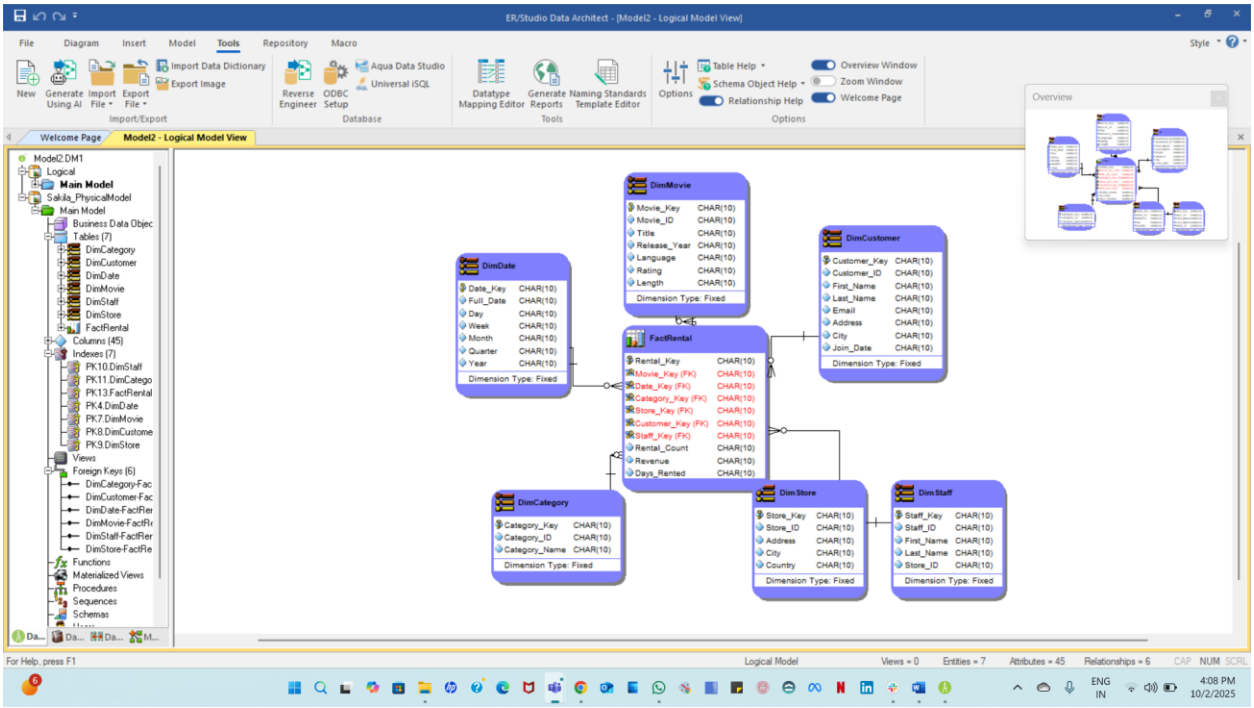
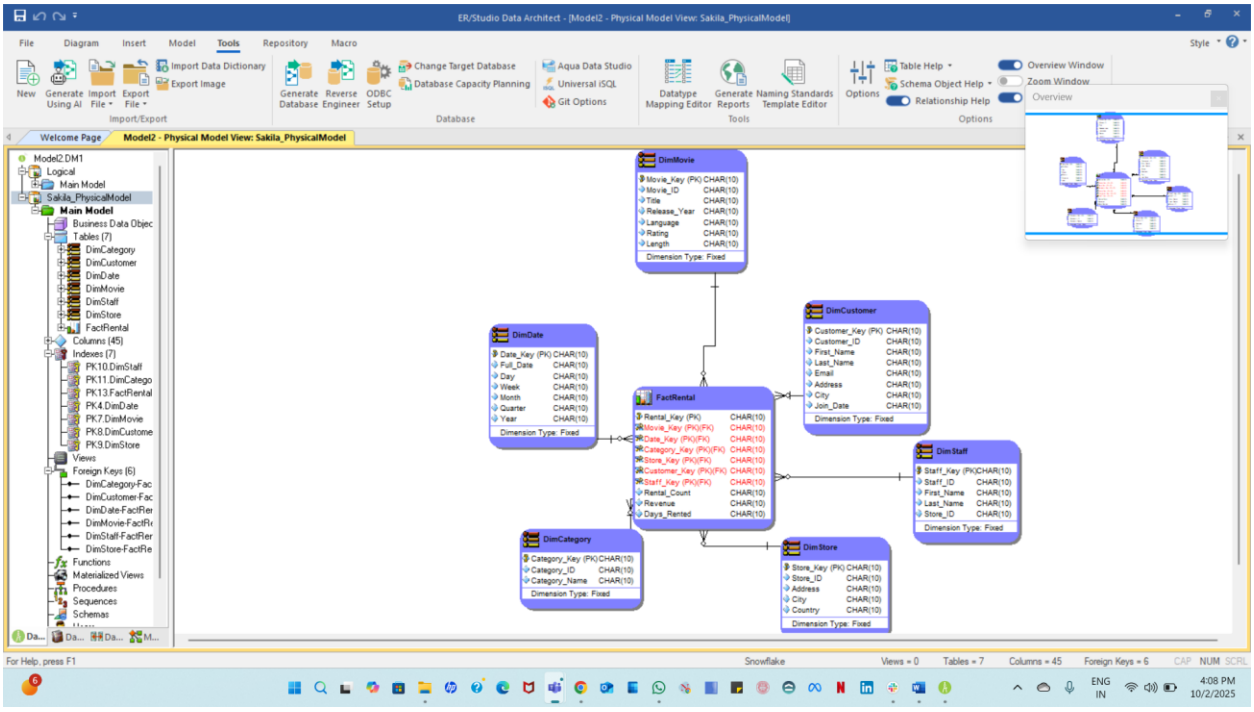
Logical Model



Physical Model



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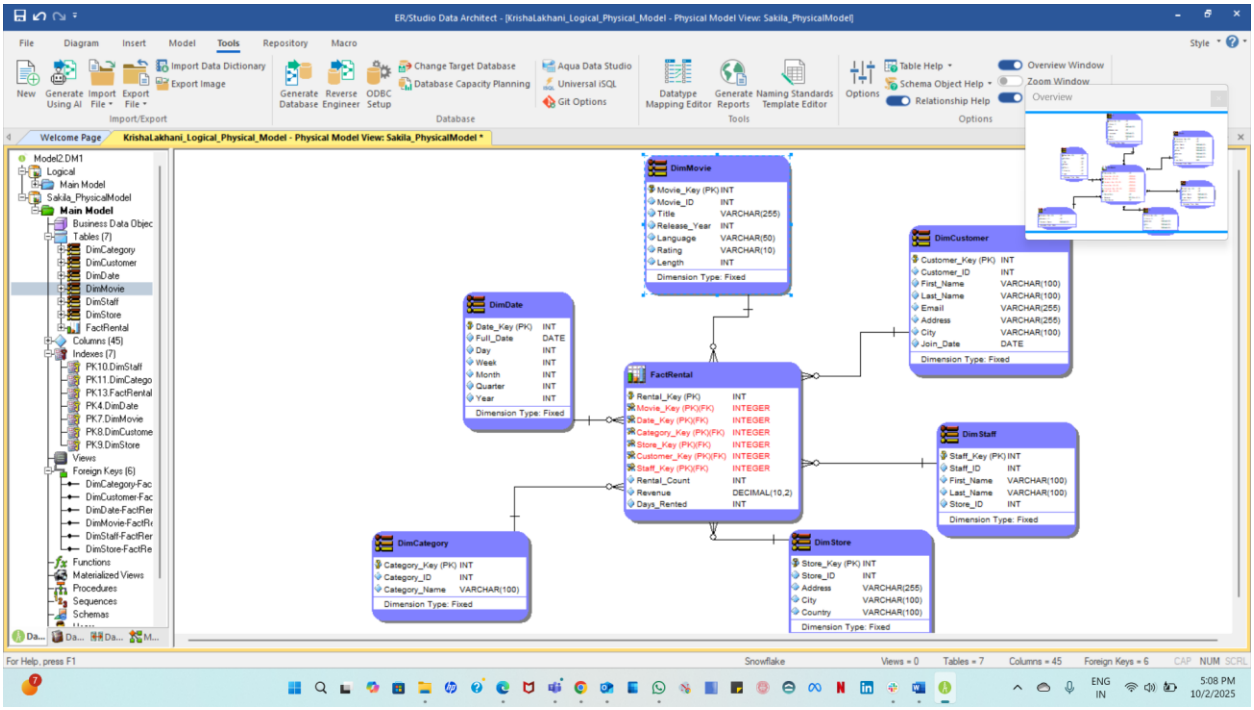
Changing Datatypes



The constructed **Star Schema** efficiently meets the analytical and reporting requirements of the organization based on the **Sakila Movie Rental** business operations. It provides insights like monitoring **customer onboarding trends**, comparing **revenue at the store** level across various time frames, pinpointing **high-performing customers and staff**, and examining the **frequency of movie rentals**.

All these business needs can be fulfilled by executing **aggregations and joins** on the central **Fact_Rental** table along with the relevant **dimension tables** (Date, Customer, Movie, Staff, Store, and Category). This dimensional approach guarantees enhanced query performance, streamlined analysis, and flexibility for upcoming analytical requirements.

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- **Customer Onboarding:** Derived from Dim_Customer joined with Dim_Date (using customer creation date) to track new customers by day, week, month, or year.
- **Most Rented Movie:** Fact_Rental joined with Dim_Movie and Dim_Date to find the most frequently rented movie per day.
- **Store Revenue (Daily)**: Fact_Rental (or Fact_Payment) joined with Dim_Store and Dim_Date to calculate daily revenue per store.
- **Revenue Comparison (Monthly):** Same fact joined with Dim_Store and Dim_Date to compare monthly revenue trends.
- **Monthly Rentals vs Last Month:** Fact_Rental joined with Dim_Store and Dim_Date to compare month-over-month rental counts.
- **Top Customers:** Fact_Rental joined with Dim_Customer and Dim_Store to identify top 5 customers by rental frequency or total spending.
- **Top Employees:** Fact_Rental joined with Dim_Staff and Dim_Store to identify top 3 staff members assisting customers.

The **grain** of the fact table defines the level of detail captured for each record.
In this model, each record in the **Fact_Rental** table represents one rental transaction at a specific store, for a specific customer, and on a specific date.
This means the grain is:

“One record per movie rental transaction (per customer, per store, per date).”

This level of granularity ensures that all business requirements — such as comparing rentals over time, identifying popular movies, and calculating revenues — can be answered using summarized aggregations.

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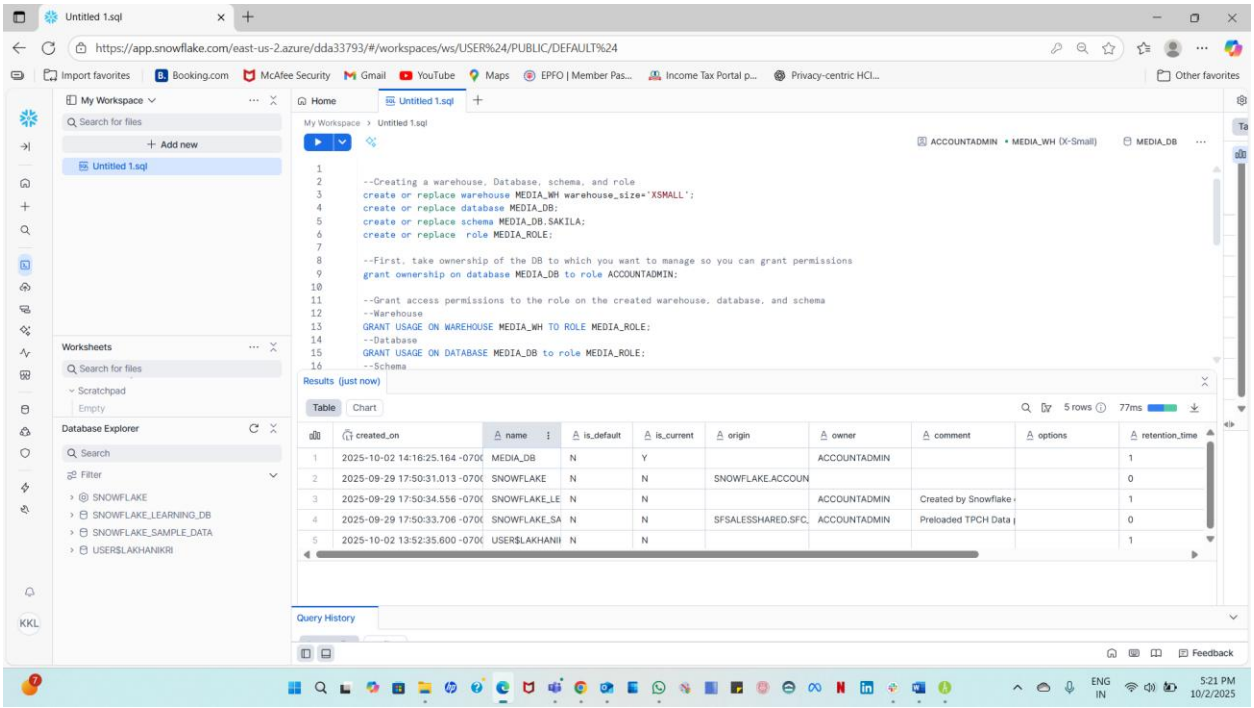
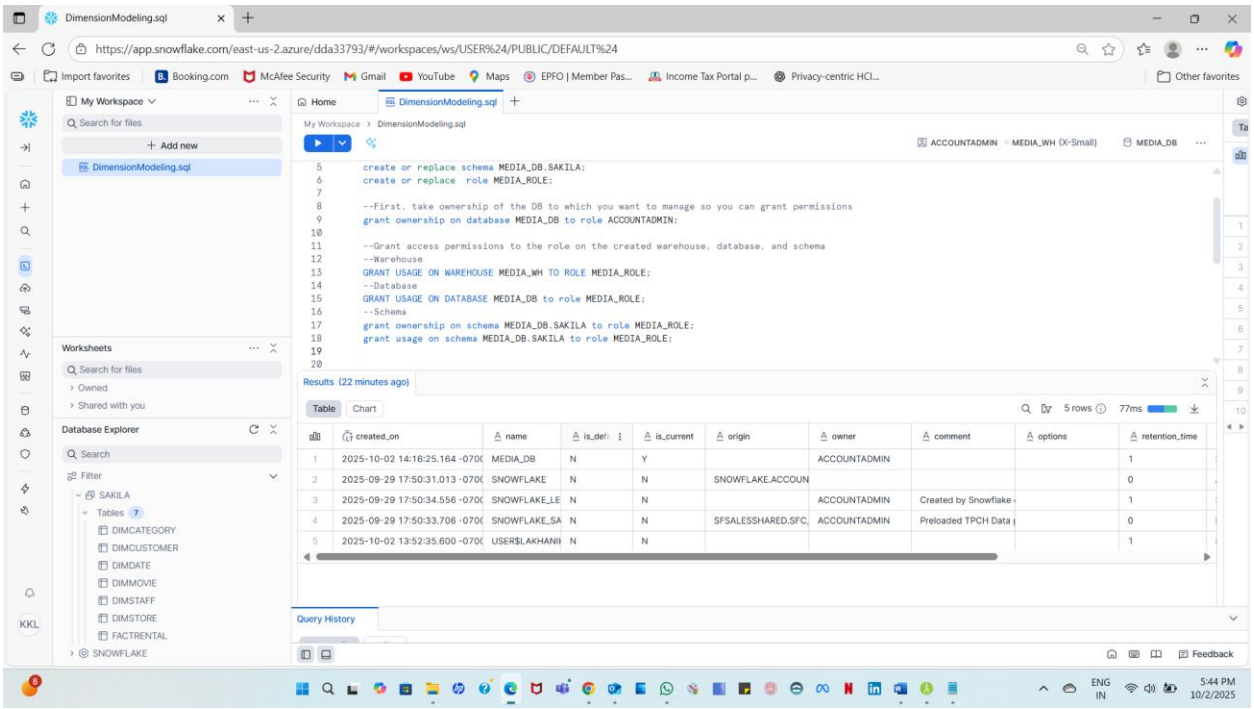
In Account Admin





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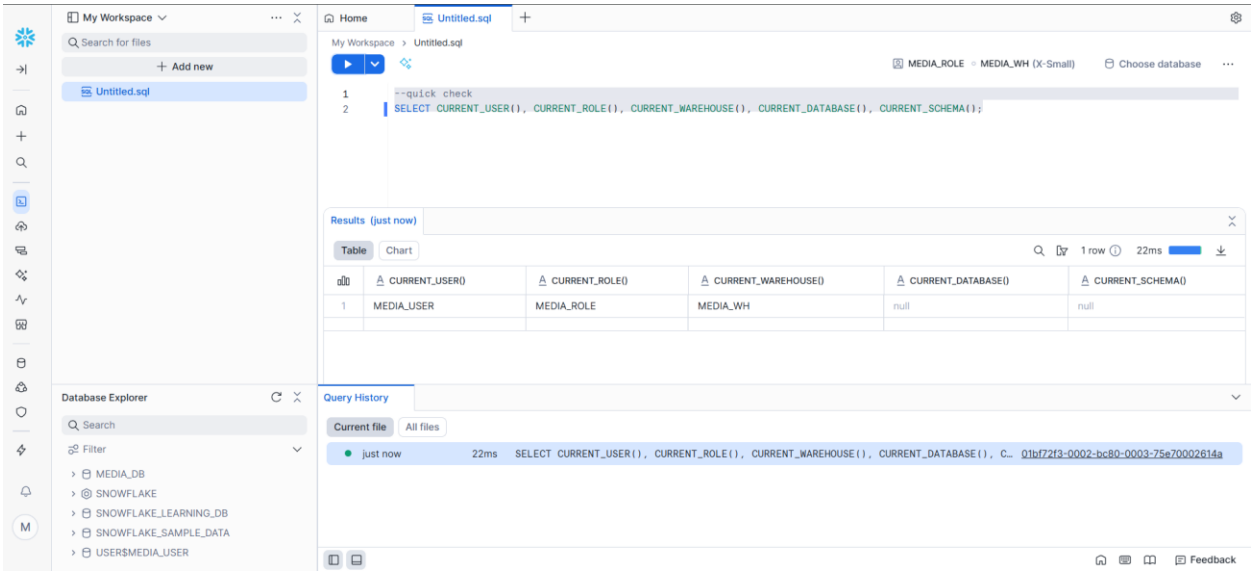
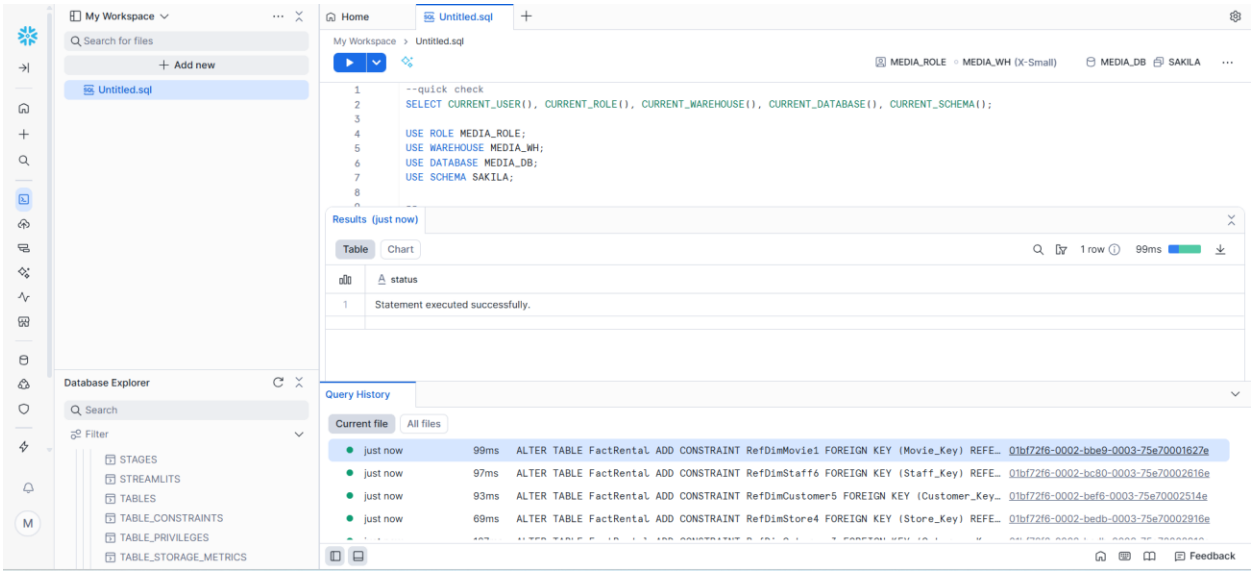
In Media Role





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