MOVIE RENTAL ANALYSIS

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DATA ANALYSIS REPORT

SAKILA DVD RENTAL STORE DATASET

REPORT ON
27-03

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INTRODUCTION

The Sakila DVD rental store have facing issues in revenue and rents, we have to create a comprehensive Power BI dashboard using the Sakila DVD Rental Store Database, providing valuable insights into the rental store business. The analysis will focus on customer behavior, film inventory management, staff performance, and store operations.

Goal:

The goal is to enable data-driven decision-making and improve overall business performance. The Power BI dashboard will offer insights into customer segmentation, sales trends, film performance, staff productivity, and store revenue. The primary aim is to optimize film inventory, enhance customer satisfaction, improve staff performance, and streamline store operations.

DATA EXPLORATION

How The Data Was Collected:

The dataset was collected from Kaggle Datasets. This dataset contains Sakila DVD rental Store Data related rents for each of the 2 Stores. It was downloaded into a desktop folder which was later loaded MySQL and Power BI for analysis.

Dataset Description:

The dataset described is a comprehensive database that appears to represent a video rental store or movie rental service. It comprises multiple tables, each representing different entities and their relationships. Taking a closer look at the key components of the dataset:

Table Explanations

Actor Table:

The actor table lists information for all the actors, including first name and last name of actors.

Address Table:

The address table contains address information for customers, staff, and stores.

Category Table:

The category table lists the categories that can be assigned to films.

City Table:

The city table contains a list of cities.

Country Table:

The country table contains a list of countries or regions.

Customer Table:

The customer table contains a list of all customers.

Film Table:

The film table lists all the films that may be in stock in the store.

Film text Table:

The content of the film text table is kept in synchrony with the film table by means of triggers on the film table INSERT, UPDATE, and DELETE operations.

Film actor Table:

The film actor table is used to support many-to-many relationships between films and actors.

Film category Table:

The film category table is used to support many-to-many relationships between films and categories.

Inventory Table:

A row in the inventory table represents a copy of a given film in a given store.

Language Table:

The language table lists all possible values for the film language and original language.

Payment Table:

The payment table records every payment made by the customer, including information such as the amount and rent paid.

Rental Table:

The rental table contains a row for each rental of each inventory item, which contains information about who rented what, when it rented it, and when it was returned.

Staff Table:

The staff table lists all staff information, including email addresses, login information, and pictures.

Store Table:

The store table lists all stores in the system.

Data Cleaning:

Data cleaning is a crucial step in the data preparation process, where raw data is transformed, corrected, and organized to improve its quality and usability for analysis. Here are some key details that I follow to data cleaning:

Data Type Transformation:

Sometimes, data have some different data types to be transformed to meet the requirements of the analysis or to certain assumptions. This could include converting categorical variables into numerical representations, logarithmic transformations, or applying mathematical functions.

Dealing with Duplicates:

Duplicates can skew analysis results and should be removed or handled appropriately. This involves identifying duplicate records based on certain key attributes and deciding whether to keep only one instance or merge them.

Handling Missing Values:

Missing values are a common issue in datasets and need to be addressed carefully. Depending on the nature of the data and the analysis to be performed, missing values can be imputed using techniques like mean, median, mode, or more sophisticated methods such as interpolation or predictive modeling.

Data Modelling:

Data modeling is primarily done to facilitate a clear understanding of the relationships between different data tables and to ensure that the database or information system accurately represents the real-world entities and their interactions.

Entity-Relationship (ER) Modeling:

ER modeling is a popular technique used in data modeling to represent the entities in a system and the relationships between them. Entities are objects or concepts that are relevant to the business, and relationships define how entities interact with each other.

Normalization:

Normalization is a technique used to organize data in a database efficiently. It involves decomposing larger tables into smaller ones and establishing relationships between them to reduce redundancy and dependency.

Denormalization:

Denormalization is the process of intentionally introducing redundancy into a database to improve performance by reducing the need for joins and queries that span multiple tables.

Data Modeling Tools:

There are many software tools available to aid in the process of data modeling. I use Power BI tool provide features for creating and visualizing data models, generating SQL scripts, and collaborating with team members.

Before Denormalization:
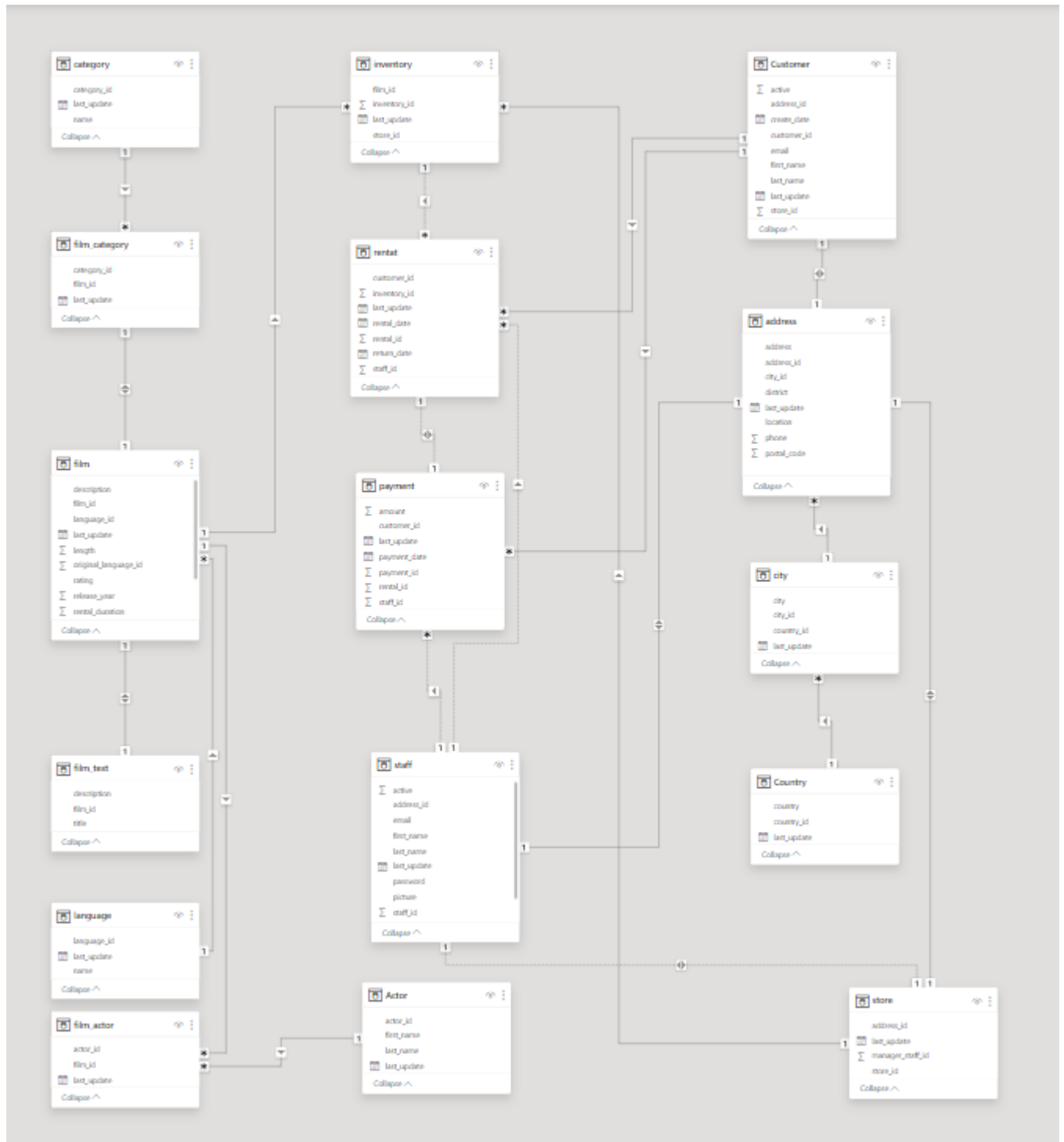
After Denormalization:
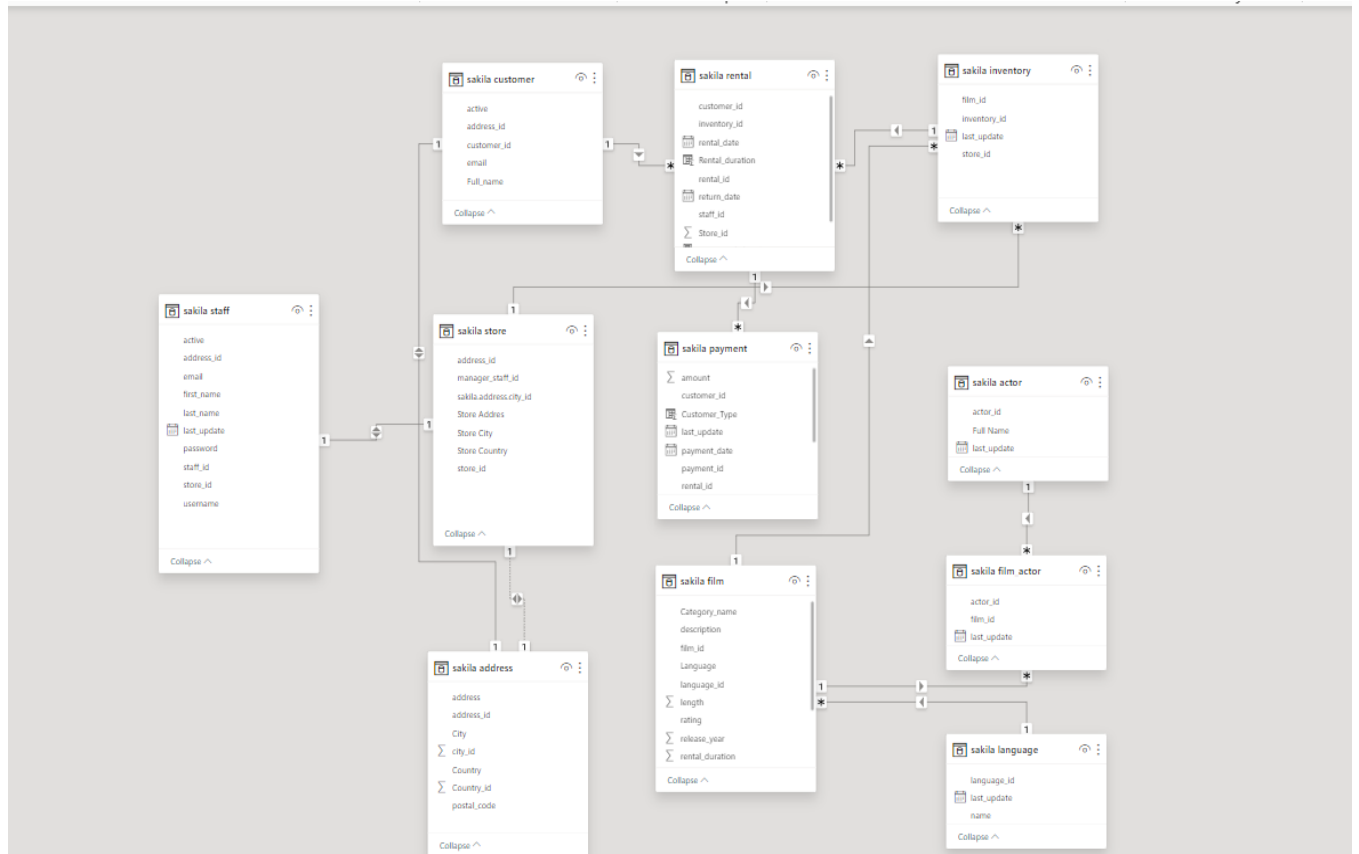
- Before Denormalization, in data some tables have normalized for data modeling Like address tables and city and country, I will merge these tables to tables to full address

Data Analysis and Visualization:

- As the process of analyzing raw data to find trends and answer questions, the definition of data analytics captures its broad scope of the field. However, it includes many techniques with many different goals.

- The data analytics process has some components that can help a variety of initiatives. By combining these components, a successful data analytics initiative will provide a clear picture of where you are, where you have been and where you should go.

- The movie rental analysis dashboard tracks several key performance indicators (KPIs) to assess the effectiveness of our rental service and guide strategic decision-making.

- One of the most critical KPIs monitored on the dashboard is the Total Rental Revenue or Monthly Rental Revenue, which provides insights into the overall Store performance of our rental business.

- Operational KPIs such as inventory stock, order fulfillment time, and customer service response time enable us to assess the efficiency of our internal processes and infrastructure. By optimizing operational performance, we can enhance the overall customer experience and drive profitability.

- The one of the most important charts are bar and column chart which are used to comparison of categorical values among total.

- Seasonal trends can be identified by analyzing historical data over 4 Months, Common seasonal patterns include monthly variations.

- Seasonal trends often reflect changes in consumer demand influenced by factors such as holidays, weather conditions, school schedules, and cultural events.

Slicers:
Slicers are interactive visual filters that allow users to dynamically explore and analyze data within Power BI dashboards and reports.

*Slicers enable users to filter and drill down into specific subsets of data, making it easier to identify trends, patterns, and insights.

* Slicers provide an intuitive and user-friendly interface for interacting with data, allowing users to customize their analysis and focus on relevant information.

- Page Navigation:
Page navigation refers to the process of moving between different pages or sections within a Power BI report to explore different aspects of the data and analysis.

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Interactive Dashboard for Visualization

	Total Rents	Total Revenue	Total customers	Total Films	Average Revenu...	Total Inventory
	15.86K	$66.89K	599	1000	$112	4581

Store — All
Rating — All
Category — All
Language — All

Rent revenue vary by month
Rent Revenue by Country
Revenue by rating
Revenue and Rents By category
Revenue By Special Features

special_features	Total_revenue
Behind the Scenes	4,646.92
Commentaries	4,980.11
Commentaries,Behind the Scenes	4,550.22
Commentaries,Deleted Scenes	4,557.89
Commentaries,Deleted Scenes,Behind the Scenes	4,776.99
Deleted Scenes	4,224.77
Deleted Scenes,Behind the Scenes	4,237.65
Trailers	4,729.61
Trailers,Behind the Scenes	4,634.78
Trailers,Commentaries	4,795.71
Trailers,Commentaries,Behind the Scenes	5,473.92
Trailers,Commentaries,Deleted Scenes	3,657.84
Trailers,Commentaries,Deleted Scenes,Behind the Scenes	3,898.17
Trailers,Deleted Scenes	4,328.53
Total	**66,888.39**

	Total Rents	Total Revenue	Total customers	Total Films	Total stores	Total Inventory
	15.86K	$66.89K	599	1000	2	4581

Inventory by Language
Distribution of films in inventory by rating
Distribution of film inventory by rental duration
Total inventory by Category

Dashboard — Top Section

Total Rents	Total Revenue	Total customers	Total Films	Total stores	Total Inventory
15.86K	$66.89K	599	1000	2	4581

Filters (sidebar):
- Store: All
- Rating: All
- Category: All
- Language: All

Distribution of by Category

Category	Inventory
Sports	74
Foreign	73
Family	69
Documentary	68
Animation	66
Action	64
New	63
Drama	62
Games	61
Sci-Fi	61
Children	60
Comedy	58
Classics	57
Travel	57
Horror	56
Music	51
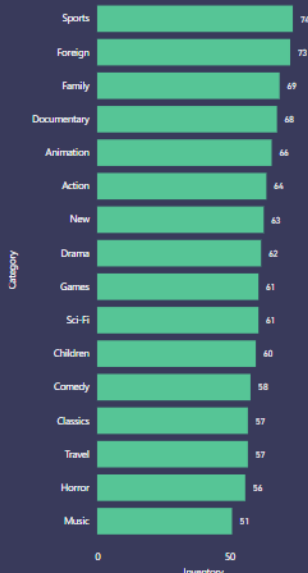
Top 10 films by Revenue

title	Total revenue	Count of rental_id
TELEGRAPH VOYAGE	231.73	27
WIFE TURN	223.69	31
ZORRO ARK	214.69	31
GOODFELLAS SALUTE	209.69	31
SATURDAY LAMBS	204.72	28
TITANS JERK	196.72	28
TORQUE BOUND	192.74	26
INNOCENT USUAL	191.74	26
HUSTLER PARTY	190.78	22
HARRY IDAHO	190.71	29

Bottom 10 films by Revenue

title	Total revenue	Count of rental_id
YOUNG LANGUAGE	6.93	7
TEXAS WATCH	5.94	6
STALLION SUNDANCE	8.93	7
REBEL AIRPORT	7.92	8
OKLAHOMA JUMANJI	5.94	6
LIGHTS DEER	9.92	8
JAPANESE RUN	7.94	6
HAROLD FRENCH	9.92	8
FREEDOM CLEOPATRA	5.95	5
DUFFEL APOCALYPSE	6.93	7
CRUELTY UNFORGIVEN	7.93	7

Distribution of film by Language

Language	Count of film_id
English	1000

Total rental by rental rate

rental_rate	Count of rental_id
$0	5.6K
$2	5.1K
$4	5.2K

Dashboard — Bottom Section

Filters (sidebar):
- Store: All
- Rating: All
- Category: All
- Language: All
- Country: All

Customer Peformance

Full_name	Count of rental_id	Total_revenue
KARL SEAL	45	221.55
ELEANOR HUNT	46	216.54
CLARA SHAW	42	195.58
RHONDA KENNEDY	39	194.61
MARION SNYDER	38	189.62
TOMMY COLLAZO	38	186.62
WESLEY BULL	40	177.60
TIM CARY	39	175.61
MARCIA DEAN	41	174.59
JUNE CARROLL	37	173.63
ANA BRADLEY	33	171.67
DIANE COLLINS	35	169.65
LENA JENSEN	32	168.68
ARNOLD HAVENS	33	167.67
MIKE WAY	35	166.65
CURTIS IRBY	37	164.63
Total	**15861**	**66,888.39**

Sum of amount by Country

City and customer_id
- customer_id (Sum)
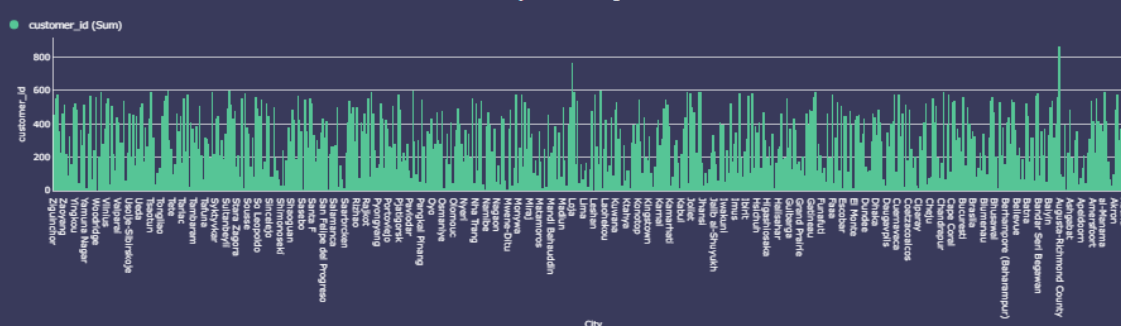
Main Insights

Total Performance Metrics:
- The stores have rented out 1000 films, generating a total revenue of $66.89K.
- There are 599 total customers who have rented films from the store.
- On average, each customer generates revenue of $112.

Revenue Variation by Month:
- The rent revenue varies by monthly, with specific figures, in May and June have less income as compared to July and august. However, it indicates that there may be fluctuations in revenue over different months, which could be further analysed to identify seasonal trends or patterns.

Revenue Breakdown by Rating:
- Revenue is categorized by film rating, with NC-17 films generating the highest revenue at $13.76K (20.57% of total revenue), followed by PG films at $13.24K (19.79%).
- This breakdown provides insights into the popularity and profitability of films based on their rating categories.

Revenue and Rent Breakdown by Category:

- The revenue and rents are further analysed based on film categories and special features.
- Different categories and special features contribute varying amounts to the total revenue and rent revenue, highlighting the preferences of customers and the popularity of certain film types.
- The top performs categories based on revenue has *sports* with 5.3k dollars and 1164 rents
- Some categories have good revenue but less rents, some categories like *Family* and *Action*
- Family Categories films are mostly preferred by every age group but low rental rate
- Action Categories films are mostly Preferred by adults

Recommendations

- **Diversify Language Options**:
  While the analysis focuses on English-language films, consider expanding the inventory to include films in other languages to cater to a more diverse customer base.
- Most of the customers prefer native language

- **Promotional Offers**:
  Offer promotions and discounts to incentivize repeat rentals and encourage customer loyalty. Consider loyalty programs or subscription plans to reward frequent renters.

- **New Store Locations**:
  Explore opportunities for opening new stores in locations with high demand for movie rentals. Conduct market research to identify underserved areas and potential customer demographics to target.
- **Online Presence**:
  Enhance the online presence of the movie rental business through a user-friendly website or mobile app. Offer online rental and streaming services to reach customers who prefer digital access to content.

- **Seasonal Promotions**:
  Capitalize on seasonal trends and holidays to launch targeted promotions and marketing campaigns. Offer themed movie bundles or discounts on popular genres during peak rental periods to boost sales. Like in the month of July and august

- **Customer Feedback**:
  Solicit feedback from customers through surveys or reviews to understand their preferences and pain points. Use this feedback to make informed decisions and continually improve the rental experience.