ANALYSIS OF SALES DATA

DBMS PROJECT REPORT

SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE DEGREE OF

BACHELOR OF TECHNOLOGY

(Computer Science and Engineering)

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ABSTRACT

Data is becoming a new rough diamond if we apply the proper methodology. We can extract functional information from it. It can be done by examining, cleaning, transforming, and modeling data to discover useful information, informing conclusions, and supporting decision-making. It can uncover patterns, trends, and correlations related to the data.

Data analysis is the right word we are talking about. Our main focus is to achieve an abstract level of information regarding the sales and marketing industry. Our project provides sales insights That help decision-making for business easy. Currently, we are limited to the database 5level for analysis but it can be extended with an interface so it can be more user-friendly.

The database level we are talking about is MySQL which is a relational database management system software that works on the concept of structured query language(SQL).

MySQL is the most popular Open Source SQL database management system and is developed, distributed, and supported by Oracle Corporation

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Naval

Mohit Kumar

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Chapter 1 Introduction

1. Introduction to Project: Analysis of Sales Data

It's an Insight into Sales Data to get an overview of the information that involves examining a company's sales figures to identify trends and patterns in sales performance.

To monitor sales performance over time, identify market opportunities, make pricing decisions, and develop sales strategies. It can also be used to identify areas of improvement and measure the effectiveness of sales campaigns.

1.1 Project Category

Analysis of Sales Data is categorized under Database System Administration.

This includes configuring, monitoring, and troubleshooting the system to ensure its availability and performance.

System Administrators are responsible for setting up and managing the database, including backing up and restoring the data, configuring user security, and ensuring the system is running properly.

1.2 Objectives

To provide a contrast between minimal input and maximum output

- We aim to provide all data on a single platform in a synchronized manner.
- This will remove redundant data present in records.
- Easy to compute complex values such as recognizing the bad sectors of the sales area.

1.3 Problem Formulation & Existing System

Requires sales management to proactively log in. This can make it difficult to incorporate it into existing reporting processes.

Some of the out-of-the-box dashboards have become critical for our day-to-day business but some functionality is also limited.

Chapter 2. Requirement Analysis and System Specification

2. Feasibility study

2.1 Technical Feasibility

The purpose project is technically feasible in all aspects, on condition that all the requirements must meet.

2.2 Hardware Requirements

MySQL Workbench requires a current system to run smoothly. The minimum hardware requirements are:

- CPU: Intel Core or Xeon 3GHz (or Dual Core 2GHz) or equal AMD CPU
- Cores: Dual Core(Quad Core is recommended)
- RAM: 8 GB (12 GB recommended)
- Graphic Accelerators: NVIDIA or AMD with support of OpenGL 1.5 or higher
- Display Resolution: 1280×1024 is recommended, and 1024×768 is the minimum.
- Storage: 25GB (150 GB recommended)

2.3 Software Requirements

The following operating systems are officially supported:

- Windows XP SP3, Vista, 7, 8, 10 (64-bit, Professional level or higher)
- Mac OS X 10.6.1+
- Linux (Ubuntu 8.04 (32bit/64bit))

MySQL Workbench also has the following general requirements:

1. The Microsoft .NET 3.5 Framework.
2. Cairo 1.6.0 or later
3. glib-2.10
4. libxml-2.6
5. libsigc++ 2.0
6. pcre

2.4 Data Requirement

Sales Data is the core part on which all the analysis operations are to be performed.

Chapter 3. System Design

3. ER-Model of Database

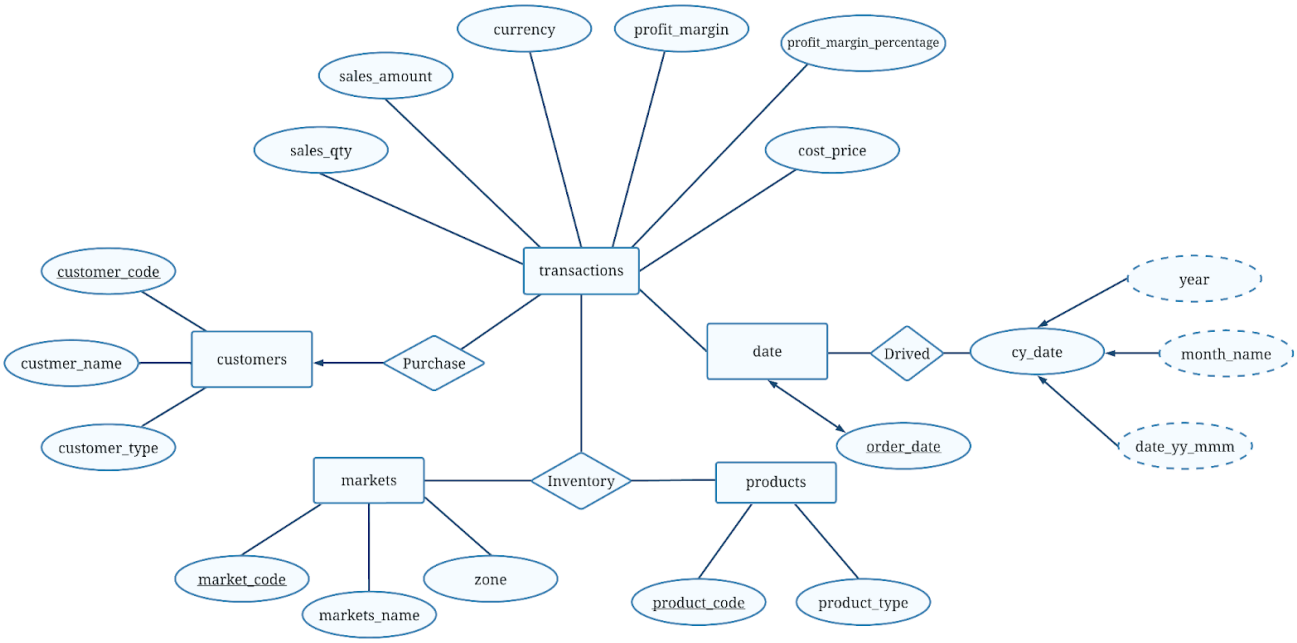

Fig 3.1 ER-Diagram that shows the abstract level of relational schema

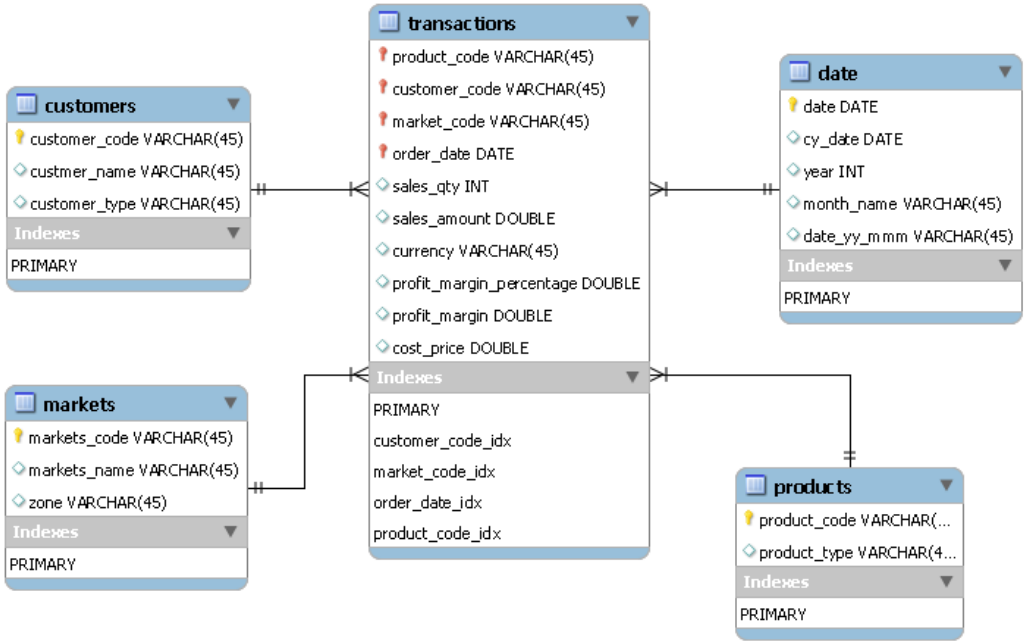

Fig 3.2 Entity Relationship-Schema of Database

Chapter 4. Implementation

4.1 Introduction of MySQL Workbench

MySQL Workbench provides a graphical tool for working with MySQL Servers and databases. MySQL Workbench fully supports MySQL Server versions 5.1 and above. It is also compatible with MySQL Server 5.0, but only some features of 5.0 may be supported. It does not support MySQL Server version 4.

MySQL Workbench provides three main areas of functionality :

1. SQL Development: Enables you to create and manage connections to database servers. As well as allowing you to configure connection parameters, MySQL Workbench provides the capability to execute SQL queries on the database connections using the built-in SQL Editor. This functionality replaces that previously provided by the Query Browser stand-alone application.

2. Data Modeling: This enables you to graphically create models of your database schema, reverse and forward engineer between a schema and a live database, and edit all aspects of your database using the comprehensive Table Editor. The Table Editor provides easy-to-use facilities for editing Tables, Columns, Indexes, Triggers, Partitioning, Options, Inserts and Privileges, Routines and Views.

3. Server Administration: Enables you to create and administer server instances. This functionality replaces that previously provided by the MySQL Administrator stand-alone application.

MySQL Workbench is available in two editions. The Community Edition and the Standard Edition. The Community Edition is available free of charge. The Standard Edition provides additional Enterprise features, such as database documentation generation, at a low cost.

4.2 Star Schema Technology used for Implementation

A star schema is a relational schema where a relational schema whose design represents a multidimensional data model. The star schema is the explicit data warehouse schema. It is known as star schema because the entity-relationship diagram of this schema simulates a star, with points, diverging from a central table. The centre of the schema consists of a large fact table, and the points of the star are the dimension tables.

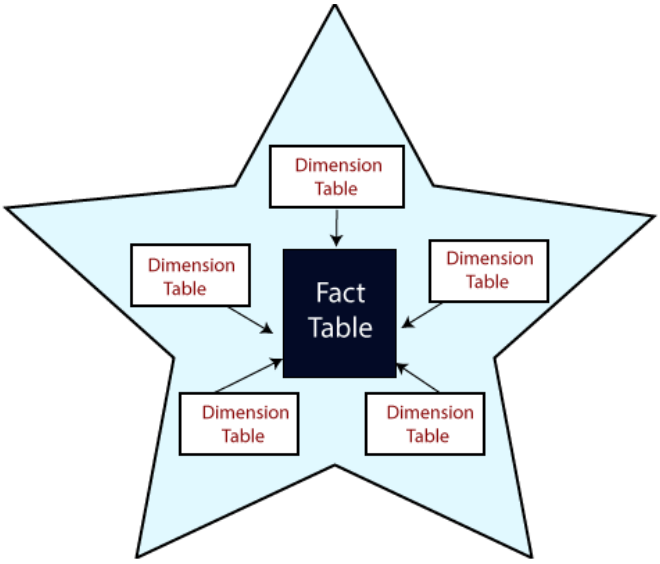

Fig 4.3 Star Schema

Fact Tables: A table in a star schema that contains facts and is connected to dimensions. A fact table has two types of columns: those that include facts and those that are foreign keys to the dimension table. The primary key of the fact tables is generally a composite key that is made up of all of its foreign keys.

Dimension Tables: A dimension is an architecture usually composed of one or more hierarchies that categorize data. If a dimension has not got hierarchies and levels, it is called a flat dimension or list. The primary keys of each dimension table are part of the composite primary keys of the fact table. Dimensional attributes help to define the dimensional value.

Chapter 5. Evaluation

5.1 Importing data

STEP 1: Select SERVER and Click on DATA IMPORT.
STEP 2: Choose IMPORT FROM SELF-CONTAINED FILE.
STEP 3: Select the file(.sql) which contains the data or put the file path in the directory path.
STEP 4: Now click on START IMPORT.

5.2 Implementing Queries on data

1. Revenue by Markets: Revenue generated by different markets.

   Query:

   ```
   SELECT SUM(transactions.sales_amount) FROM transactions
   WHERE market_code='MARK001';
   ```

   Output :

SUM(transactions.sales_amount)
18042702

   Fig: 5.2.1

   Description**:** In the above query, we just get the total amount generated from different markets. By using the WHERE condition, we can check all the market sales amounts.

2. Monthly Revenue of a particular Market: Revenue generated by the specific market of a specific month.

   Query:

   ```
   SELECT SUM(transactions.sales_amount) FROM transactions
   INNER JOIN date ON transactions.order_date = date.date
   WHERE year=2018 AND month_name='November' AND
   market_code='MARK001';
   ```

   Output :

SUM(transactions.sales_amount)
721323

   Fig: 5.2.2

Description**:** In the above query, We use two tables (transactions table and date table). INNER JOIN ( ) helps to join two tables the transaction table and the data table. On the SELECT operation can select the sales_amount and the WHERE condition can select the month, year and market code which we needed. And it gives the total sales amount of a particular month of a specific market.

3. Monthly Sales Quantity of a particular Market: Product sales by the specific market of a specific month.

Query:

```
SELECT SUM(transactions.sales_qty) FROM transactions
INNER JOIN date ON transactions.order_date = date.date
WHERE year=2018 AND month_name='November' AND
market_code='MARK001';
```

Output:

SUM(transactions.sales_amount)
721323

Fig: 5.2.3

Description**:** In the above query, We use two tables (transactions table and date table). INNER JOIN ( ) helps to join two tables the transaction table and the data table. On the SELECT operation can select the sales_amount and the WHERE condition can select the month, year and market code which we needed. And it gives the total product sales of a particular month of a specific market.

4. Top 5 Products by Revenue: Top 5 selling products by revenue.

Query:

```
SELECT product_code, COUNT(sales_amount),
SUM(sales_amount) FROM transactions GROUP BY product_code
ORDER BY COUNT(sales_amount) DESC LIMIT 5;
```

Output:

product_code	COUNT(sales_amount)	SUM(sales_amount)
Prod065	3952	16259345
Prod334	3890	31468996
Prod053	3765	15135392
Prod318	3128	68967202
Prod117	3016	8663214

Fig: 5.2.4

Description**:** In the above query, We analyse top-selling products by using ORDER BY ( ) and GROUP-BY ( ), which can group two columns and set the order in descending order, which helps to get the higher values first.

5. Top 5 Customers by Revenue: Top 5 customers who bought from this business.

Query:

```
SELECT transactions.customer_code,customers.custmer_name,
SUM(transactions.sales_amount)
FROM transactions INNER JOIN customers
ON transactions.customer_code=customers.customer_code
GROUP BY customer_code
ORDER BY SUM(transactions.sales_amount) DESC LIMIT 5;
```

Output :

customer_code	custmer_name	SUM(transactions.sales_amount)
Cus006	Electricalsara Stores	413333588
Cus022	Electricalslytical	49644189
Cus003	Excel Stores	49115620
Cus005	Premium Stores	44905916
Cus020	Nixon	43893083

Fig: 5.2.5

Description**:** In the above query, We analyse top customers who bought products from this business. INNER JOIN ( ) helps to join the transaction table and customer table, then GROUP BY ( ) helps to group the two tables by that particular column name, then ORDER BY ( ) helps to sort the order of the SUM(transactions.sales_amount) column in descending order. So we get the top 5 customers of the business.

Chapter 6. Conclusion and Future Scope.

6.1 Future Scope

This Project can be extended further using Tableau. It is a visual analytics platform that transforms the way we use data to solve problems and helps people see and understand data.

Their visual analytics platform is transforming the way people use data to solve problems.

6.2 Conclusion

Basically, Analysis of Sales Data (Insights) can be more user-friendly with Tableau which works as front End GUI as Dashboard

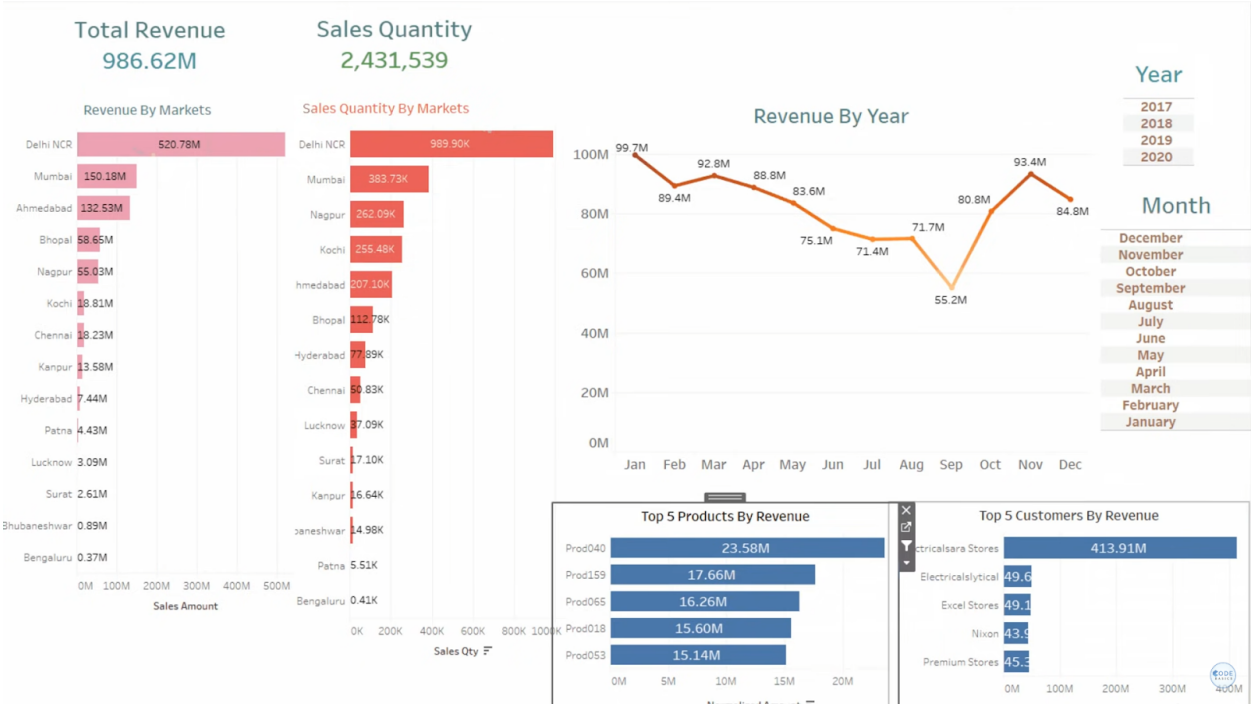

Fig: 6.1.1 Dashboard version of Analysis of Sales Data

Whole MySQL is working behind to fetch data and display in above Dashboard which makes this project at next level.

References/Bibliography

1. MySQL Workbench Introduction: https://docs.oracle.com/cd/E19078-01/mysql/mysql-workbench/wb-intro.html

2. Fig4.3 Source: https://www.google.com/url?q=https://www.javatpoint.com/data-warehouse-what-is-star-schema&sa=D&source=docs&ust=1670445509663792&usg=AOvVaw2mqGTEYVolaaPq3jSY03v3

3. ERD Maker: https://www.lucidchart.com

4. Sample Data for Analysis: https://drive.google.com/drive/folders/13l128wQIP8tWEzaZleVXAMWtny6iOs-7?usp=share_link