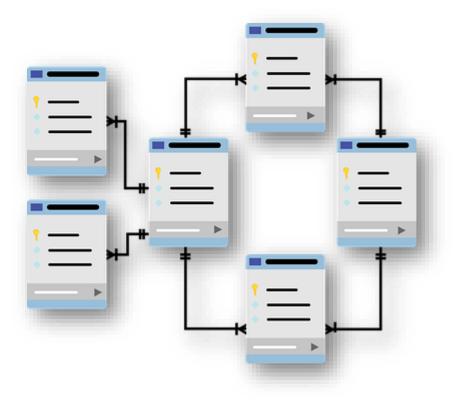


# DATABASE DESIGN

## Vehicle Insurance Company



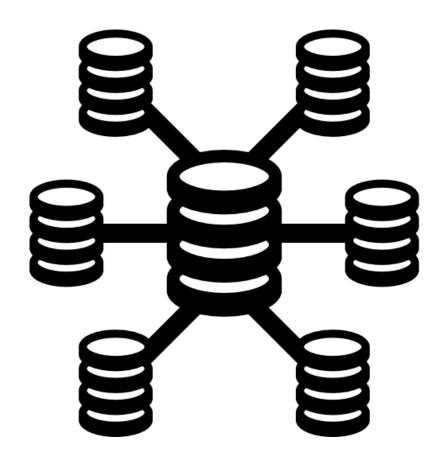
# PRANJAL | SHUBHAM | DEEPANSHU | VINITA

18BCS115 | 18BCS094 | 18BCS114 | 18BCS109 Indian Institute of Information Technology, Dharwad





# INDIAN INSTITUTE OF INFORMATION TECHNOLOGY DHARWAD



SUBMITTED BY: SHUBHAM SHARMA

VINITA YADAV

**DEEPANSHU SACHDEVA** 

PRANJAL AGGARWAL

SUPERVISED BY: DR UMA S

Ms. Supriya

#### Title of the Project

Design and implement a database for a Vehicle Insurance Company

#### **Intent of the Document**

This documentation includes a proper discussion of how the given project was designed and implemented which included modelling of the entities, designing the database system, insertion of values in each table, normalisation, coding of SQL queries, etc.

#### **Objective**

To gain practical knowledge on the working of a DBMS, encountering and overcoming the problems and challenges faced during its implementation, become comfortable in using the database modelling and designing tools and being able to apply all these principles for creating solutions for realistic business scenarios. Lastly, an important objective of this project is to be able to collaborate and work as team and bring out value for everybody.

#### Abstract

The "Vehicle Insurance Management System" has been developed to override the problems prevailing in the practicing manual system. This database system is supported to eliminate and, in some cases, reduce the hardships faced by existing manual systems.

Main objective of this project is to design a simple software application for insurance companies for managing customers who buy new vehicles and take insurance for those vehicles. Details of payment, time period, vehicle details, customer personal details, insurance specifications are updated to the database.

We can add, delete, modify, existing records and search for old records within short time.

#### **Project Implementation**

The project was implemented inline with the following steps:

- Database Development
  - Conceptual Data Model (CDM)
  - Logical Data Model (LDM)
  - Physical Data Model (PDM)
- Executing the given queries
- Preparation of report based on the work done
- Exploring and understanding new ways and different topics in DBMS
- · Working on the suggestions given by the supervisors and improving the database

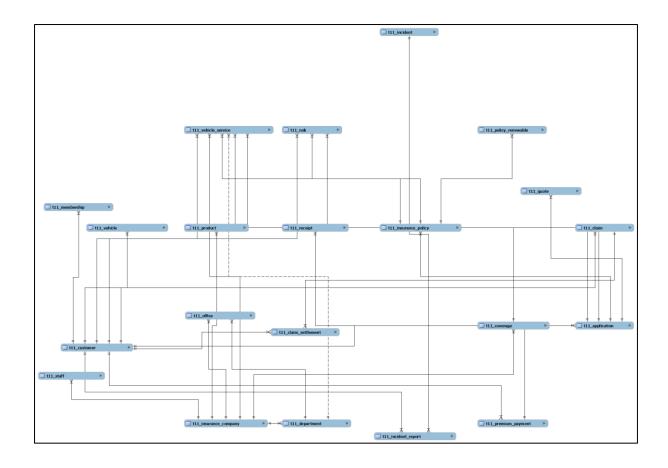
#### **Technology Stack**

The following technologies were used while implementing the project:

- MySQL Workbench (for designing the database)
- GitHub (for collaborating on the SQL queries)
- Google Meet (for regular team discussions and suggestions)

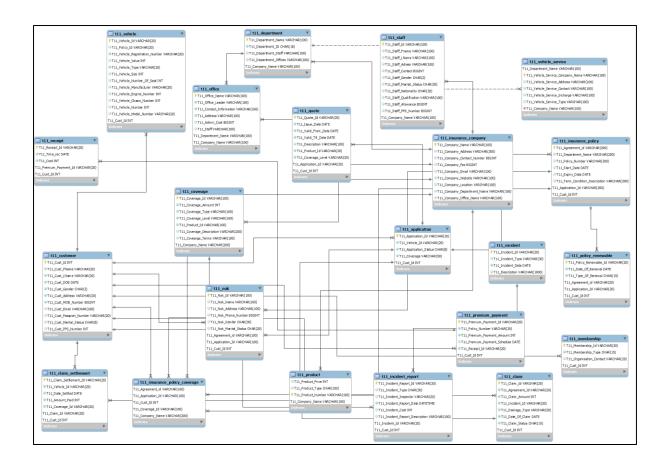
#### Conceptual Data Model (CDM)

The Conceptual Data Model is a structured business view of the data required to support business processes, record business events, and track related performance measures. This model focuses on identifying the data used in the business but not its processing flow or physical characteristics. This model's perspective is independent of any underlying business applications. The conceptual data model represents the overall structure of data required to support the business requirements independent of any software or data storage structure.



#### Logical Data Model (LDM)

The Logical Data Model is used to define the structure of data elements and to set relationships between them. The logical data model adds further information to the conceptual data model elements. The advantage of using a Logical data model is to provide a foundation to form the base for the Physical model. However, the modelling structure remains generic. At this Data Modelling level, no primary or secondary key is defined. At this Data modelling level, you need to verify and adjust the connector details that were set earlier for relationships.



### Physical Data Model (PDM)

A Physical Data Model describes a database-specific implementation of the data model. It offers database abstraction and helps generate the schema. This is because of the richness of meta-data offered by a Physical Data Model. The physical data model also helps in visualizing database structure by replicating database column keys, constraints, indexes, triggers, and other RDBMS features.

#### **Queries**

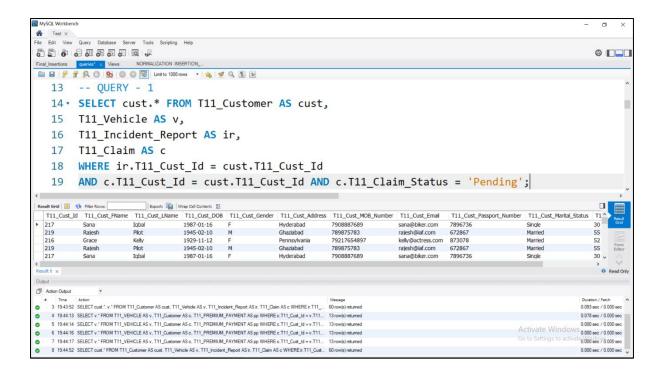
Query - 1: Retrieve Customer and Vehicle details who has been involved in an incident and claim status is pending.

```
SELECT cust.* FROM T11_Customer AS Cust,

T11_Vehicle AS v, T11_Incident_Report AS ir, T11_Claim AS c

WHERE ir.T11_Cust_Id = cust.T11_Cust_Id

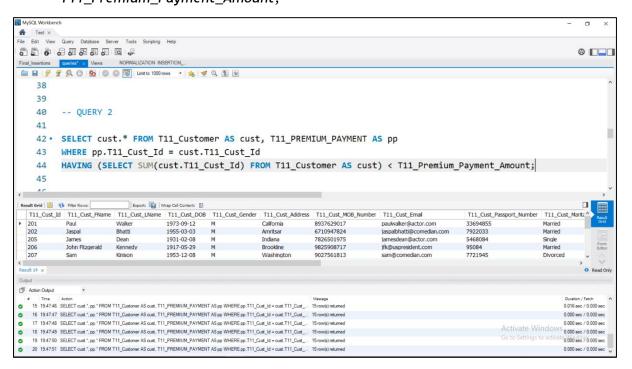
AND c.T11_Cust_Id = cust.T11_Id AND c.T11_Claim_Status = 'Pending';
```



Query - 2: Retrieve customer details who has premium payment amount greater than the sum of all the customerIds in the database.

SELECT cust.\* FROM T11\_Customer AS cust, T11\_PREMIUM\_PAYMENT AS pp
WHERE pp.T11\_Cust\_Id = cust.T11\_Cust\_Id

HAVING (SELECT SUM(cust.T11\_Cust\_Id) FROM T11\_Customer AS cust) <
T11\_Premium\_Payment\_Amount;



Query - 3: Retrieve Company details whose number of products is greater than departments, where the departments are located in more than one location.

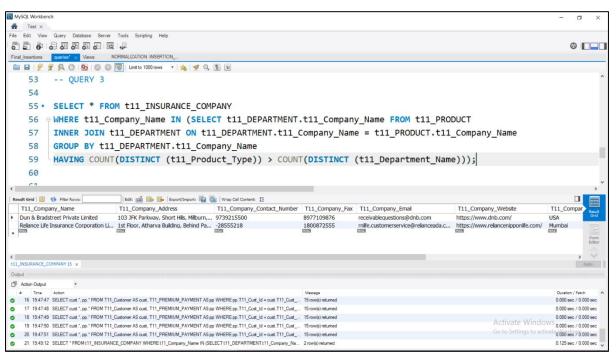
SELECT \* FROM t11\_INSURANCE\_COMPANY

WHERE t11\_Company\_Name IN (SELECT t11\_DEPARTMENT.t11\_Company\_Name FROM t11\_PRODUCT

INNER JOIN t11\_DEPARTMENT ON t11\_DEPARTMENT.t11\_Company\_Name = t11\_PRODUCT.t11\_Company\_Name

GROUP BY t11\_DEPARTMENT.t11\_Company\_Name

HAVING COUNT(DISTINCT (t11\_Product\_Type)) > COUNT(DISTINCT (t11\_Department\_Name)));



Query - 4: Select Customers who have more than one Vehicle, where the premium for one of the Vehicles is not paid and it is involved in accident.

SELECT cust.\* FROM T11\_CUSTOMER AS c INNER JOIN T11\_PREMIUM\_PAYMENT
AS pp ON c.T11\_cust\_id = pp.T11\_cust\_id

INNER JOIN T11\_VEHICLE AS v

ON c.T11\_cust\_id = v.T11\_cust\_id

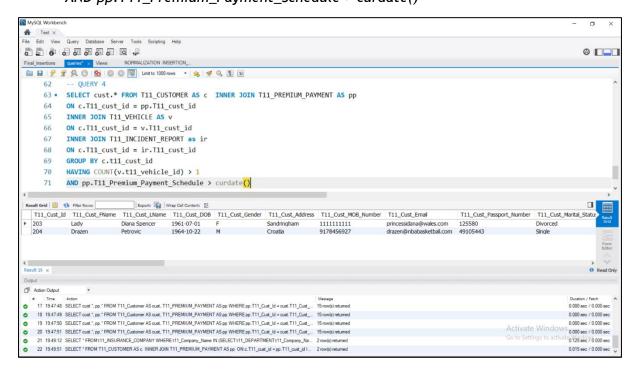
INNER JOIN T11\_INCIDENT\_REPORT as ir

ON c.T11\_cust\_id = ir.T11\_cust\_id

GROUP BY c.t11\_cust\_id

HAVING COUNT(v.t11\_vehicle\_id) > 1

AND pp.T11\_Premium\_Payment\_Schedule > curdate()



Query - 5: Select all vehicles which have premium more than its vehicle number.

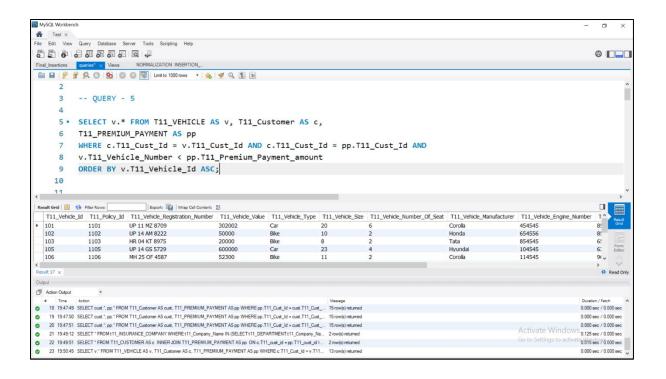
SELECT v.\* FROM T11\_VEHICLE AS v, T11\_Customer AS c,

T11\_PREMIUM\_PAYMENT AS pp

WHERE c.T11\_Cust\_Id = v.T11\_Cust\_Id AND c.T11\_Cust\_Id = pp.T11\_Cust\_Id AND

v.T11\_Vehicle\_Number < pp.T11\_Premium\_Payment\_amount

ORDER BY v.T11\_Vehicle\_Id ASC;



Query - 6: Retrieve Customer details whose Claim Amount is less than Coverage Amount and Claim Amount is greater than Sum of (CLAIM\_SETTLEMENT\_ID, VEHICLE\_ID, CLAIM\_ID, CUST\_ID)

```
SELECT cust.*, c.T11_Claim_Amount, cov.T11_Coverage_Amount, cs.T11_Claim_Id

cs.T11_Coverage_Id,cs.T11_Claim_Settlement_Id,cs.T11_Vehicle_Id

FROM T11_Customer AS cust,

T11_Claim_Settlement AS cs,

T11_Claim_AS c, T11_Coverage AS cov

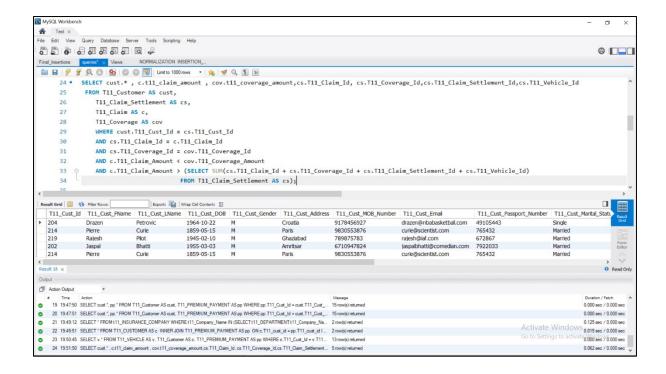
WHERE cust.T11_Cust_Id = cs.T11_Cust_Id

AND cs.T11_Claim_Id = c.T11_Claim_Id

AND cs.T11_Coverage_Id = cov.T11_Coverage_Id AND

c.T11_Claim_Amount < cov.T11_Coverage_Amount AND

c.T11_Claim_Amount > (SELECT SUM(cs.T11_Claim_Id + cs.T11_Coverage_Id + cs.T11_Claim_Settlement_Id + cs.T11_Vehicle_Id) FROM T11_Claim_Settlement AS cs);
```



#### <u>Views</u>

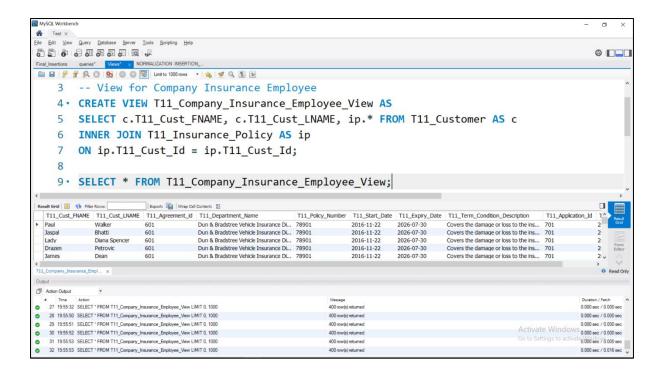
View-1 for Company Insurance Employee

ON ip.T11\_Cust\_Id = ip.T11\_Cust\_Id;

CREATE VIEW T11\_Company\_Insurance\_Employee\_View AS

SELECT c.T11\_Cust\_FNAME, c.T11\_Cust\_LNAME, ip.\* FROM T11\_Customer AS c

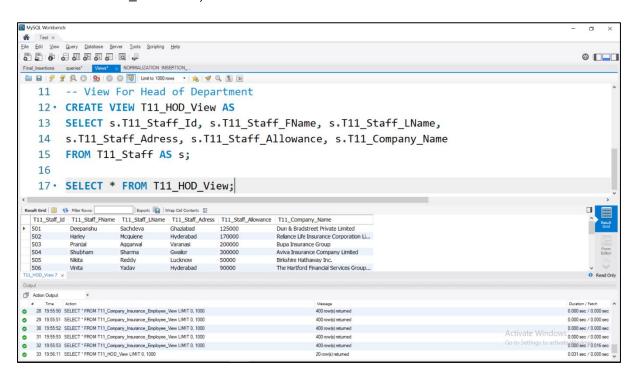
INNER JOIN T11\_Insurance\_Policy AS ip



#### View-2 for Head of Department for the Insurance Company

CREATE VIEW T11\_HOD\_View AS

SELECT s.T11\_Staff\_Id, s.T11\_Staff\_FName, s.T11\_Staff\_LName,
s.T11\_Staff\_Adress, s.T11\_Staff\_Allowance, s.T11\_Company\_Name
FROM T11\_Staff AS s;



#### **Conclusion**

The project was successfully executed and completed timely which was possible because of the great team spirit shown by each member and their contributions. The project was completed in the following major steps:

- Table Creations
- Data Insertions
- Testing Data for Anomalies
- Query Creation and Execution

Work done in all the above steps were divided equally among all the four members and all the tasks which required collaboration were done on video conferencing with inputs from each and every member.