

USE CASE STUDY REPORT

Executive Summary:

In the year 2019, a brand-new startup called MySyara had launched in Dubai. The idea of MySyara is to give car owners the comfort of having services provided to their doorstep. The startup needs a database that would allow it to keep track of all the transactions, customers, and services provided. In short, a Customer Relation Database through which the company can perform analysis and make meaningful insights through which it can grow the business. The idea is to implement a relational database that is industry-ready for application. To access the services of MySyara, customers must first download the mobile application from either App Store or Play Store. After installing the app, the users can enjoy the services provided to them by MySyara. In today's world, data is one of the biggest weapons to grow and startups like MySyara benefit the most by having an organized database. This database can allow the startup to perform various tasks like marketing, employee performance analysis, and so on!

We first designed an EER and UML diagram through which we were able to have a clear picture of how we could create an organized dataset. Then, we mapped the conceptual model to a relational model with the required primary and foreign keys. We then created a database on Excel, which was modeled by segmenting data into different tables where the parameters in each table connected with every other parameter present inside the table, and when necessary, also connected with parameters present in other tables. This is possible by implementing the data in database management systems such as MySQL and MongoDB. These database systems help us implement SQL and NoSQL queries so that the end goal of converting raw data into something meaningful, is met. We performed various queries on MySQL and then a prototype database on MongoDB to study the feasibility of this database in a NoSQL environment.

After performing various queries, analyses not only on the above-mentioned environments but also by connecting and analyzing the database to other software like Tableau, Python, and R-Studio, we can say that the created database is of great success. To further improve the database, the company could provide more data that would involve more customer information. for example, the data collected through social media marketing campaigns can allow the startup to perform queries and even further, advertise according to the responses collected through the campaign.

I. Introduction

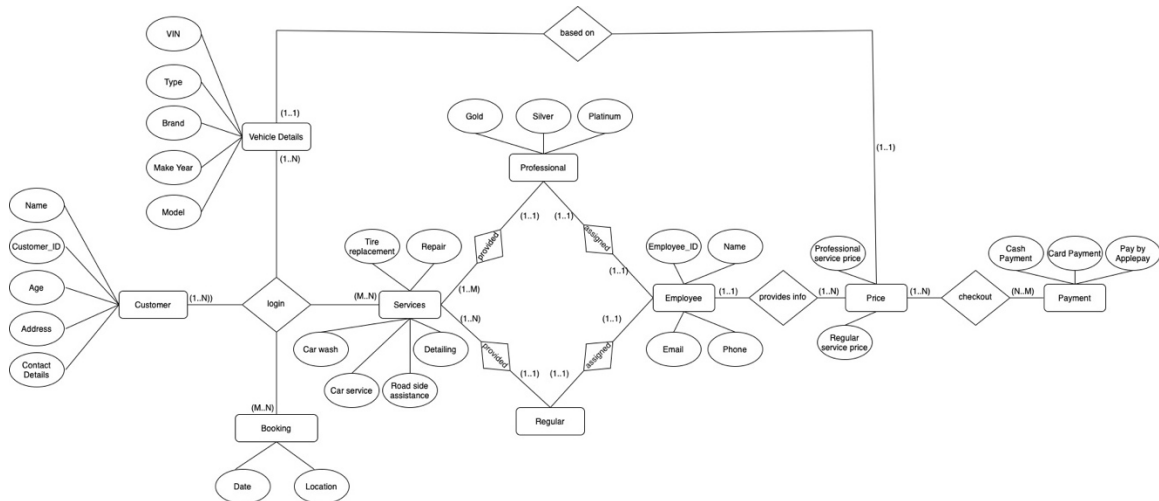
In the year 2019, a brand-new startup called MySyara had launched in Dubai. The idea of MySyara is to give car owners the comfort of having services provided to their doorstep. To access the services of MySyara, customers must first download the mobile application from either App Store or Play Store. Once downloaded, the customer must provide certain details like their personal details and vehicle details. Personal details include name, age, address, and contact information, and vehicle details including type, brand, make year, model, and vehicle number. Once these details are provided, the customer is now able to log in and access all types of services provided by MySyara. MySyara customers have the option to select between two types of services: Pro and Regular. Pro service is a subscription type model, where the customer gets to choose between three categories of services, namely, Silver, Gold, and Platinum. If the customer does not prefer the subscription type model, they can choose the Regular services. Regular customers and Pro customers have access to all services available, but Pro customers are provided discounts, combos, and many other perks. Once, the customer decides the service(s) that they want, they will be assigned an employee. The employee will provide the customers with all sorts of information regarding the service(s) and how long it will take. After the diagnosis of the vehicle, the employee will inform the customer regarding the cost of the services. Once the prices are decided, the employee will be directed to a payment page through which they will have to make the payment. Types of payment involve cash, credit/debit card, and net banking. MySyara now requires a way to record all the information starting from the customer details to payment.

While implementing the database, these rules must be followed:

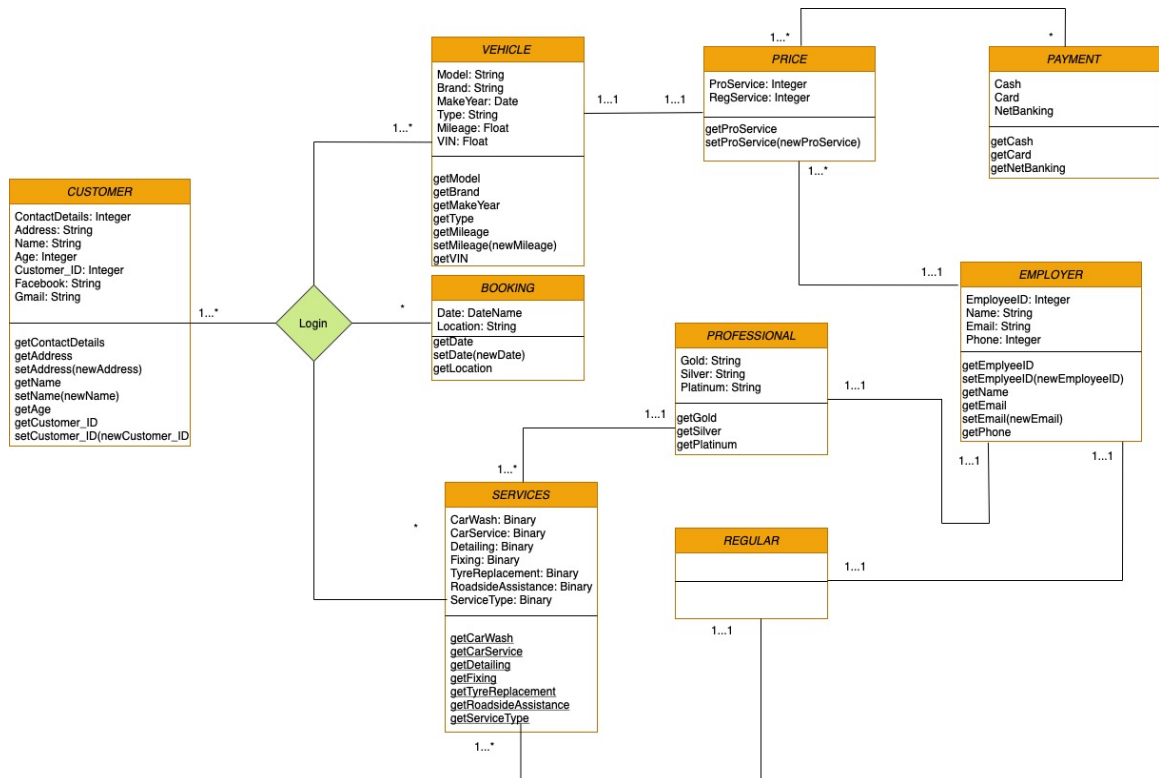
1. Each customer can have multiple vehicles, multiple services, and multiple bookings.
2. Each vehicle can be owned by only one customer.
3. Each booking for services belongs to one customer.
4. There can be many services under one booking and many bookings under one service.
5. Each vehicle has a set price for each service.
6. One booking regardless of the number of services will be assigned only one employee.
7. Price can be pro price and regular price but is assigned by only one employee per booking.
8. One booking can have only one price but many payment methods.

II. Conceptual Data Modeling

1. EER Diagram



2. UML Diagram



III. Mapping Conceptual Model to Relational Model

Primary Key - Underlined

Foreign Key- *Italicized*

Database Admin (UserID, Password)

Customer (Customer_ID, Name, Age, Address, Contact Details)

Vehicle Details (*Customer_ID*, Vehicle Number, Type, Brand, Make Year, Model)

Foreign Key – Customer_ID refers to Customer_ID in Customer

Booking (Customer_ID, Date and Time, Location)

Foreign Key – Customer_ID refers to Customer_ID in Customer

Foreign Key is also Primary Key

Service Type (Regular (Gold, Platinum, Silver), Professional)

Services (Customer_ID, Tire replacement, Detailing, Repair, Car wash, Car service, Roadside Assistance)

Foreign Key – Customer_ID refers to Customer_ID in Customer

Foreign Key is also Primary Key

Employee (Employee_ID, Name, Email, Phone)

Price (Professional service price, Regular service price)

Payment (Payment_ID, Card, Cash, NetBanking)

IV. Implementation of Relation Model via MySQL and NoSQL

MySQL Implementation:

Query 1. Find employees assigned to all the car models and brand.

```
SELECT A.model, A.brand, B.employee_assigned  
FROM vehicle A  
JOIN employee B on ( A.customer_id = B.customer_id);
```

	model	brand	employee_assigned
▶	jazz	honda	Fadi
	jazz	honda	Fadi
	jazz	honda	Shafeek
	jazz	honda	Shafeek
	jazz	honda	Adil
	jazz	honda	Adil
	jazz	honda	Adil
	jazz	honda	Mehtaab
	jazz	honda	Aman
	jazz	honda	Mehtaab
	jazz	honda	Hadi
	jazz	honda	Aman
	jazz	honda	Moussa
	jazz	honda	Aman
	jazz	honda	Adil

Query 2. Find out how many customers used the “Roadside Assistance” service.

```
SELECT `Roadside_Assistance`, `customer_id` FROM Services WHERE  
Roadside_Assistance IN (select Roadside_Assistance FROM Services WHERE  
Roadside_Assistance = 1);
```

	Roadside_Assistance	customer_id
▶	1	68737173
	1	11587013
	1	68430116
	1	30552004
	1	70524720
	1	27247590
	1	99003720
	1	30417669
	1	47980094
	1	80453999
	1	59609670
	1	10706997
	1	21455217
	1	59065485

Query 3. Find out customers who used all the services of MySyara.

```
SELECT * FROM services
WHERE `Car_Wash` = 1 AND `Detailing` = 1 AND `Car_Service` = 1 AND `Fixing` =
1 AND `Tyre_Replacement` = 1 AND `Roadside_Assistance` = 1;
```

	customer_id	Car_Wash	Car_Service	Detailing	Fixing	Tyre_Replacement	Roadside_Assistance	service_type
▶	68430116	1	1	1	1	1	1	2
	58948888	1	1	1	1	1	1	3
	40917750	1	1	1	1	1	1	2
	40554736	1	1	1	1	1	1	3
	30059944	1	1	1	1	1	1	4
	74479667	1	1	1	1	1	1	3
	94329796	1	1	1	1	1	1	1
	99927540	1	1	1	1	1	1	2
	44780254	1	1	1	1	1	1	3
	20301621	1	1	1	1	1	1	4
	52110879	1	1	1	1	1	1	1
	35948432	1	1	1	1	1	1	4
	68438213	1	1	1	1	1	1	4
	98566575	1	1	1	1	1	1	2
	69793853	1	1	1	1	1	1	4

Query 4. Find all cars along with the customers who used all the services of MySyara

```
SELECT A.customer_id, A.brand, B.Car_Wash, B.Car_Service, B.Detailing, B.Fixing,
B.Tyre_Replacement, B.Roadside_Assistance
FROM vehicle A JOIN services B ON ( A.customer_id = B.customer_id)
WHERE `Car_Wash`= 1 AND `Car_Service`= 1 AND `Detailing` = 1 AND `Fixing` = 1
AND `Tyre_Replacement` = 1 AND `Roadside_Assistance` = 1;
```

	customer_id	brand	Car_Wash	Car_Service	Detailing	Fixing	Tyre_Replacement	Roadside_Assistance
▶	68430116	honda	1	1	1	1	1	1
	58948888	honda	1	1	1	1	1	1
	40917750	honda	1	1	1	1	1	1
	40554736	honda	1	1	1	1	1	1
	30059944	honda	1	1	1	1	1	1
	74479667	honda	1	1	1	1	1	1
	94329796	honda	1	1	1	1	1	1
	99927540	honda	1	1	1	1	1	1
	44780254	honda	1	1	1	1	1	1
	20301621	honda	1	1	1	1	1	1
	52110879	honda	1	1	1	1	1	1
	35948432	honda	1	1	1	1	1	1
	68438213	honda	1	1	1	1	1	1

Query 5. Find the service type each customer used by linking service and service type table.

```
SELECT customer_id, service_type FROM services
WHERE service_type in ('1','2','3');
```

	customer_id	service_type
▶	23645631	1
	65645152	3
	12663567	1
	92845629	1
	76395421	1
	60991056	1
	98602312	3
	99079614	3
	79493691	1
	38414510	2
	43723235	2
	51381108	1
	78045206	1
	12660799	1
	16887435	3

Query 6. Find out all the cars that has a mileage of over 50,000 miles.

```
SELECT mileage FROM vehicle WHERE mileage >= '50000'
ORDER BY mileage
DESC;
```

	mileage
▶	137822
	133892
	129773
	128699
	128320
	127229
	122342
	121921
	118310
	118292
	117842
	117248
	113479
	113247
	113244

NoSQL Implementation:

1. Display all details where the brand name of the car is Honda and model name is Jazz:

```
db.collection.find({brand: "honda" ,model:"jazz"})
```

Output	Database content
<pre>[{ "_id": "61b4223fa3fc820015ae0318", "customer_id ": " 99079614", "brand": "honda", "model": "jazz", "mileage": " 14508 ", "location": " Karama ", "date": " 20-June-19", "employee_assigned": " Aman ", "cost": "1370" }, { "_id": "61b4223fa3fc820015ae0319", "customer_id ": " 43764089", "brand": "honda", "model": "jazz", "mileage": " 16788 ", "location": " Palm Jumeirah ", "date": " 01-March-21 ", "employee_assigned": " Fadi ", "cost": "2676" }]</pre>	

2. Display all the details where mileage of the car is greater than 20000:

```
db.collection.find( { mileage: { $gte: " 20000 " } } )
```

Output	Database content
<pre>[{ "_id": "61b4243b24dde2000f782d38", "customer_id ": " 70072079", "brand": "honda", "model": "amaze", "mileage": " 40282 ", "location": " Business Bay ", "date": " 03-Feb-20 ", "employee_assigned": " Aman ", "cost": "7867" }, { "_id": "61b4243b24dde2000f782d3a", "customer_id ": " 49518802", "brand": "honda", "model": "city", "mileage": " 23674 ", "location": "Discovery Gardens", "date": " 20-Jul-19 ", "employee_assigned": " Hadi ", "cost": "3453" }]</pre>	

3. Display all the details where location is Karama and employee assigned is Aman

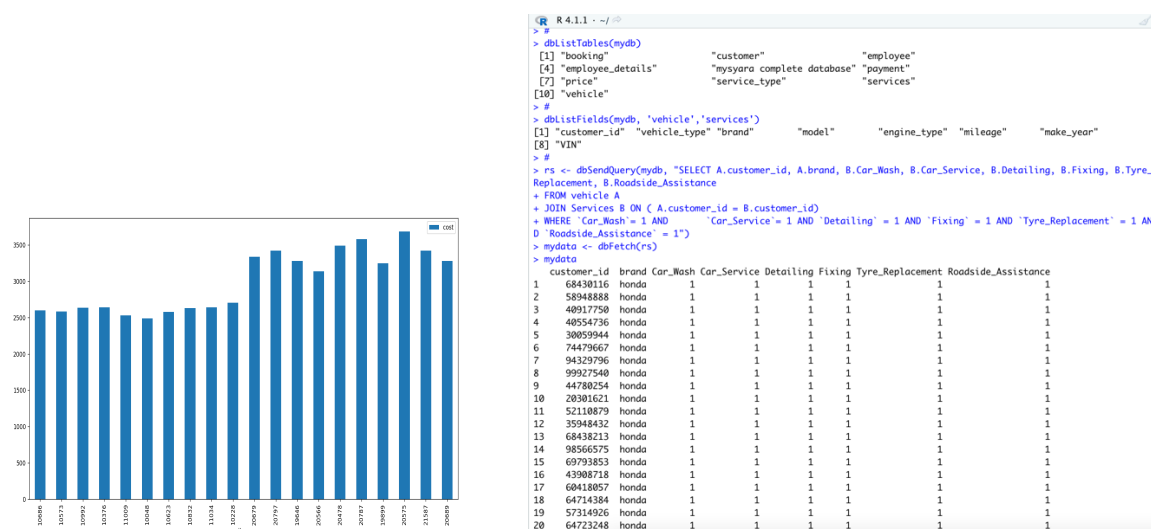
```
db.collection.find( {
location: " Karama "
employee_assigned: "Aman"
} )
```

Output
Database content

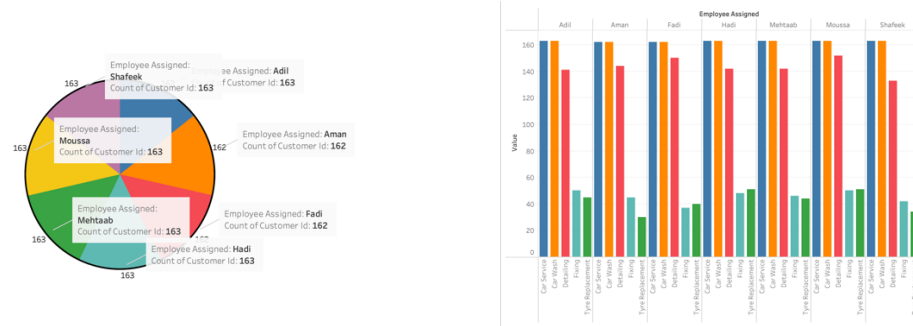
```
[
  {
    "_id": "61b4281ca3fc820015ae0457",
    "customer_id": " 99079614",
    "brand": "honda",
    "model": "jazz",
    "mileage": " 14508 ",
    "location": " Karama ",
    "date": " 20-June-19",
    "employee_assigned": " Aman ",
    "cost": "1370"
```

V. Database Access via R, Python, and Tableau

Database Access via Python and R:



Database Access via Tableau:



VII. Summary and recommendation

The brand-new startup known as MySyara was launched in 2019 in Dubai and focuses to provide car services to the customers to their doorsteps. The MySyara database is a Customer Relationship database designed and implemented in MySQL to perform analysis and draw meaningful insights that ensure the steady growth of the business. The analysis and visualization job has been carried out using tools like Tableau and R-studio and programming languages like python.

Improvement of the database ensures data quality and database management to perfectly maintain the customer details and services provided by the company and carry out marketing campaigns to promote the brand. Not only this, but it is important to ensure 100% accuracy, up-to-date, and complete as possible. Having complete information ensures a complete view of customer's information in a database.