

BLAZE WHEEL



Software Design and Architecture Project Report

Course Code: **SEN-221**

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Introduction:

Blaze Wheel, a state-of-the-art vehicle management system designed to streamline and optimize your vehicles operations. Our project focuses on building a strong and effective database infrastructure that acts as the Blaze Wheel system's backbone, guaranteeing flawless data administration.

A strong and scalable architecture specifically designed to handle the complicated requirements of modern vehicle management lies at the basis of Blaze Wheel's database project. We have carefully planned out and developed an organized database schema that effectively arranges and maintains crucial data on automobiles, maintenance logs, maintenance/repair costs, and more.

Design Patterns:

Implemented:

- **Decorator Pattern for Dashboard.**
- **Decorator Pattern for Home.**
- **Singleton Pattern.**

Implemented by default:

- **Façade Pattern.**
- **Template Pattern.**

Architecture:

- **3 Layer Architecture.**

Module Distribution:

Muhammad Zain: **Database designing, Reporting, Authentication, system log and administrative controls, Dashboard Decorator.**

Hamza Rajput: **Vehicle acquisition, spare parts, and maintenance(Vendor, Vehicle and Technician), Singleton Design Pattern.**

Muhammad Askari (Group Leader): **Sell Vehicle, Employee, Customer and UI Designing, Home Decorator.**

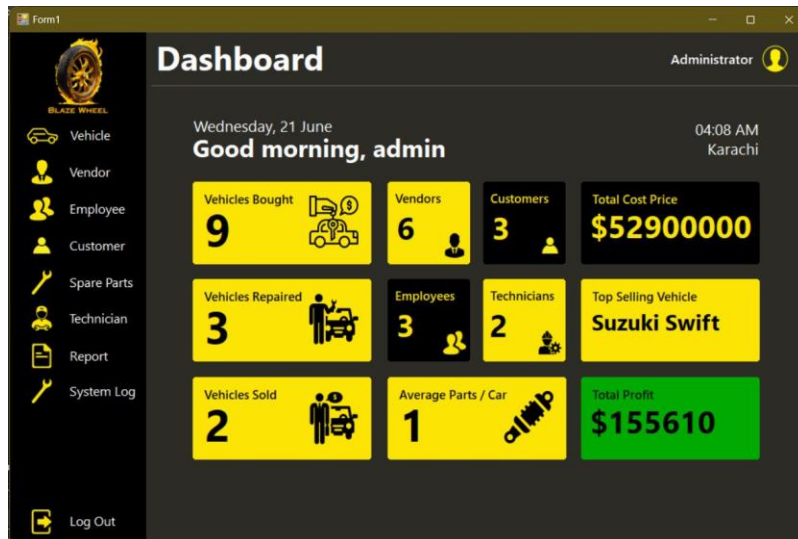
Github Link:

https://github.com/HMZ-rajput/DBMS_ProjectV1.0

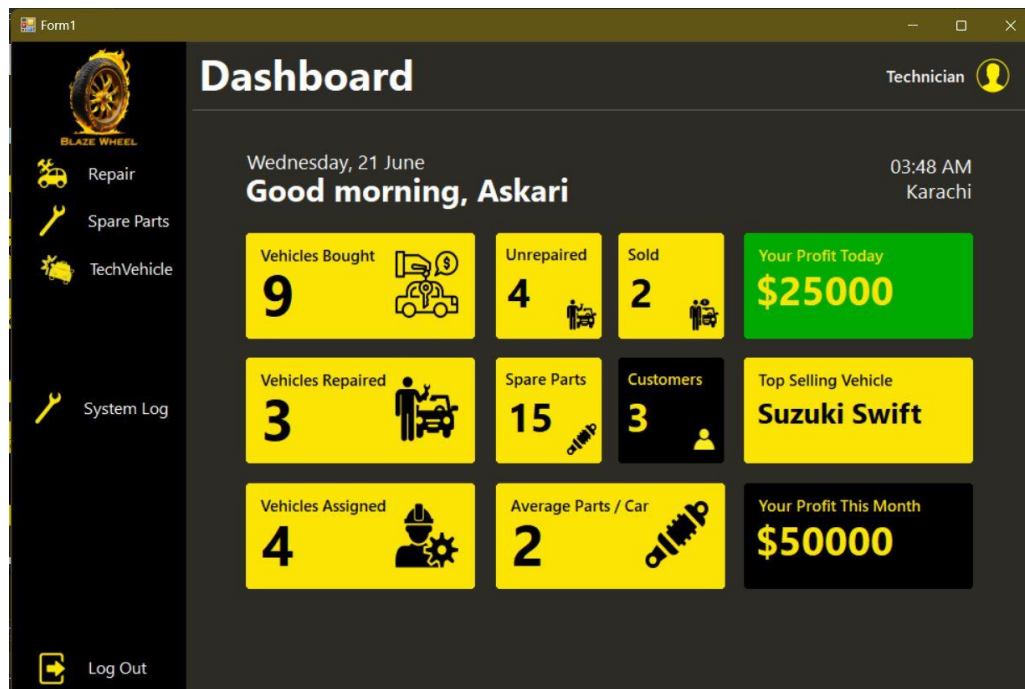
Interfaces:

Employee, Technician, and Admin Dashboard:

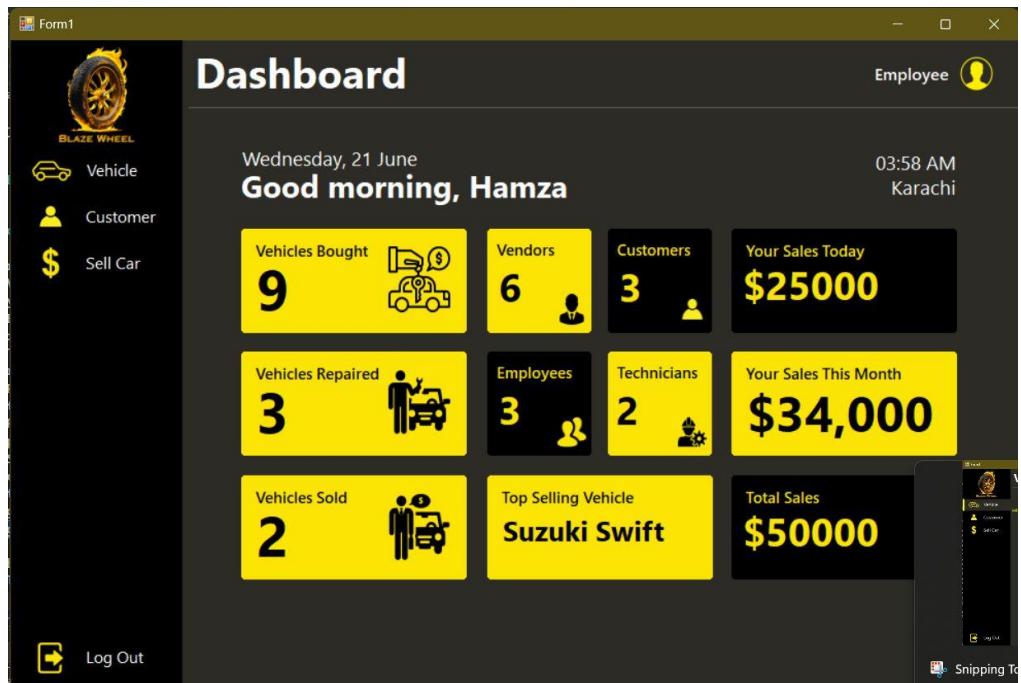
Admin Dashboard:



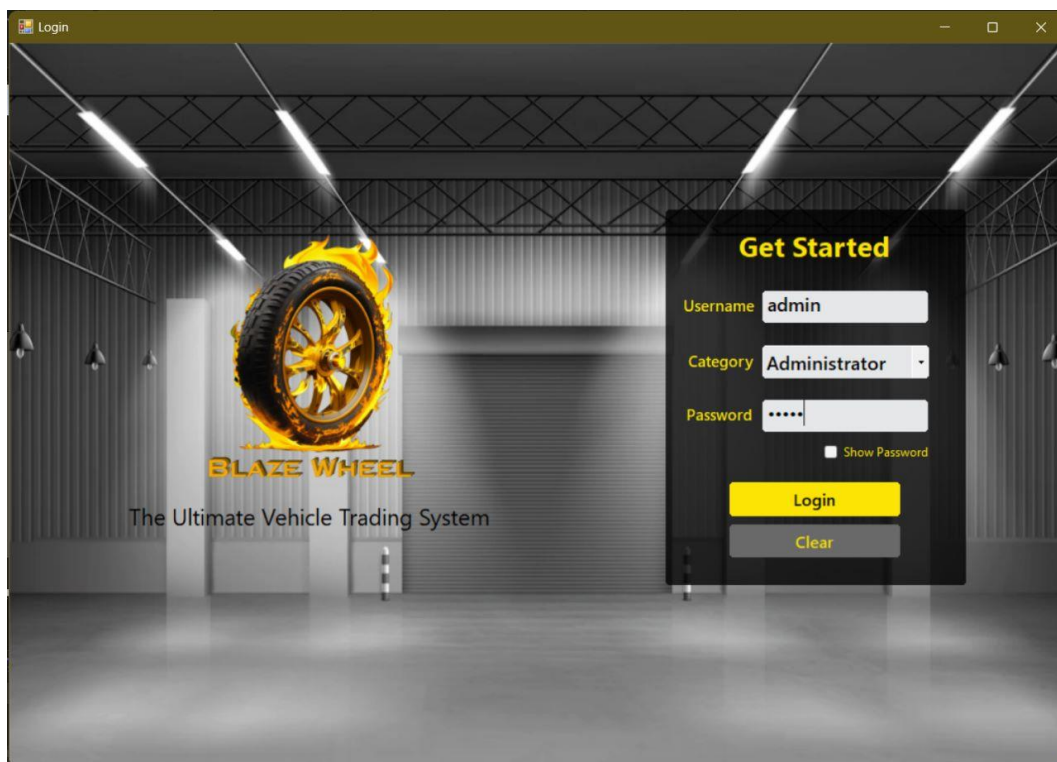
Technician Dashboard:




Employee Dashboard:



Login Window:




Vehicle Window:



- Vehicle
- Vendor
- Employee
- Customer
- Spare Parts
- System Log
- Report
- Log Out

Vehicles

Administrator 

Vehicle ID
Make
Pakwheels


Model
Mileage

Year
Price

Add Update Delete


VehicleID	Make	Model	Year	Mileage	VendorID	BuyDate	SaleDate	Cost	Status
4	Suzuki	Swift	2019	34000	1	6/18/2023 ...		250000	SOLD
5	Toyota	Corolla	2016	450000	1	6/18/2023 ...		5700000	REPAIRED
6	Toyota	Corolla	2017	560000	1	6/18/2023 ...		5750000	REPAIRED
7	Ford	Taurus	2020	88000	1	6/18/2023 ...		8000000	REPAIRING
8	Hyundai	Sonata	2021	25000	1	6/18/2023 ...		7400000	NOT REPAIR
9	Suzuki	Cultus	2015	25000	1	6/18/2023 ...		2400000	REPAIRED
10	Suzuki	Cultus	2017	52000	1	6/18/2023 ...		3400000	NOT REPAIR
11	Toyota	Land Cruiser	2010	350000	1	6/20/2023 ...		12000000	REPAIRING
12	Ford	Explorer	2019	25000	1	6/21/2023 ...	6/21/2023 3...	8000000	SOLD

Vendor Window:



- Vehicle
- Vendor
- Employee
- Customer
- Spare Parts
- System Log
- Report
- Log Out

Vendors

Administrator 

Vendor ID
Name

Address
Phone

Add Update Delete

VendorID	Name	Address	Phone
1	Pakwheels	Islamabad, Pakistan	0232433224
2	Vava Cars	Lahore, Pakistan	0211112222
3	OLX	Karachi, Pakistan	02133779933
4	motory.com	Jeddah, KSA	0500230801
5	Global Automotive	California, USA	013445346389
6	Bahria Cars	Multan, Pakistan	02398431112

Customer Window:

The Customer Window application interface features a sidebar menu on the left with icons for Vehicle, Vendor, Employee, Customer (highlighted), Spare Parts, System Log, and Report. At the bottom of the sidebar is a 'Log Out' button. The main header displays the 'BLAZE WHEEL' logo and the title 'Customers'. The top right corner shows the user role 'Administrator' with a profile icon. The form area contains input fields for ID, Name, Address, and Phone. Below these fields are 'Add', 'Update', and 'Delete' buttons. A table at the bottom lists customer records.


CustomerID	Name	Address	Phone
1	Ayesha	Karachi, PK	0302057008
3	Rehan	Islamabad, PK	02394332423
5	Bilal Salman	Karachi, PK	4234234322

Employee Window:

The Employee Window application interface features a sidebar menu on the left with icons for Vehicle, Vendor, Employee (highlighted), Customer, Spare Parts, System Log, and Report. At the bottom of the sidebar is a 'Log Out' button. The main header displays the 'BLAZE WHEEL' logo and the title 'Employee'. The top right corner shows the user role 'Administrator' with a profile icon. The form area contains input fields for Employee ID, Name, Address, Phone, Commission Percentage, and Password. Below these fields are 'Add', 'Update', and 'Delete' buttons. A table at the bottom lists employee records.

EmployeeID	Name	Address	Phone	misionPercen	sessionStatus	Password
1	Hamza	Hyderabad, Sind...	03333333333	7	INACTIVE	L9wBdwV90ksL...
2	Nadeem	Karachi, Sindh, PK	03011100774	10	INACTIVE	L9wBdwV90ksL...
3	Zain	Karachi, Sindh, PK	03313471072	9	INACTIVE	L9wBdwV90ksL...

Technician Window:



- Vehicle
- Vendor
- Employee
- Customer
- Spare Parts
- Technician
- Report
- System Log
- Log Out

Technicians

Administrator

ID

Name

Address

Phone

Password


Add

Update

Delete

TechnicianID	Name	Address	Phone	SessionStatus	Password
1	Askari	Karachi, Sindh, PK	03000023990	INACTIVE	KbqdnO9aZKYRFqJJO...
2	Arsalan	Karachi, Sindh, PK	03040835093	INACTIVE	KbqdnO9aZKYRFqJJO...

Report Window:



- Vehicle
- Vendor
- Employee
- Customer
- Spare Parts
- System Log
- Report
- Log Out


Report


Administrator


	VehicleID	Make	Model	Mileage	Name	Cost	PartsCost	Tec
▶	4	Suzuki	Swift	34000	Pakwheels	250000		
	5	Toyota	Corolla	450000	Pakwheels	5700000	8000	5000
	6	Toyota	Corolla	560000	Pakwheels	5750000	4000	5000
	6	Toyota	Corolla	560000	Pakwheels	5750000	33000	5000
	7	Ford	Taurus	88000	Pakwheels	8000000		
	8	Hyundai	Sonata	25000	Pakwheels	7400000		
	9	Suzuki	Cultus	25000	Pakwheels	2400000		
	10	Suzuki	Cultus	52000	Pakwheels	3400000		
	11	Toyota	Land Cruiser	350000	Pakwheels	12000000	7000	
	11	Toyota	Land Cruiser	350000	Pakwheels	12000000	10000	
	12	Ford	Explorer	25000	Pakwheels	8000000	15000	5000
	12	Ford	Explorer	25000	Pakwheels	8000000	5000	5000
	12	Ford	Explorer	25000	Pakwheels	8000000	4000	5000
					OLX			
					Bahria Cars			
					motory.com			
					Global Automotive			


Tech Vehicle Window:


Form1

TechnicianVehicle Technician 

 **BLAZE WHEEL**

 Repair

 Spare Parts

 TechVehicle


Available Vehicles Vehicle ID

Vehicle Detail

VehicleID	Make	Model	Year	Status	pairDescripti	RepairCost	hnicianCharg
5	Toyota	Corolla	2016	REPAIRED	Enter		50
6	Toyota	Corolla	2017	REPAIRED	Enter		5000
8	Hyundai	Sonata	2021	NOT REPAIR			
12	Ford	Explorer	2019	SOLD	ford explorer	29000	5000


Repair Details


Repair Detail ID	Model	PartName	PartCost	Quantity	Total
1	Corolla	Spark Plug	2000	4	8000
3	Corolla	Spark Plug	2000	2	4000
4	Corolla	Battery	11000	3	33000


 Log Out


Sell Window:


Form1

Sell Employee 

 **BLAZE WHEEL**

 Vehicle

 Customer

 Sell Car


Vehicle Customer Sell Price

Cost 5700000 Commission Percentage 7 %

Repair Cost Your Commission 0


Total 0

Sell ID

 Log Out

Repair Window:


Form1


BLAZE WHEEL


Repair

Spare Parts

TechVehicle

 Log Out

RepairCar

Technician 

Part

Side Mirrors

Quantity

2

Repair ID

Description

Vehicle

Cultus

Charges

Mark as Repaired


Add Part

Update Part

Delete Part

RepairDetail ID	PartName	PartDescription	PartCost	Quantity	Total
10	Fuel pump	Delivers fuel to	10000	2	20000
11	Battery	Provides electrical	11000	1	11000
12	Air filter	Filters dust from	5000	1	5000
13	Side Mirrors	Reflective surface	13000	2	26000

Spare Part Window:



- Vehicle
- Vendor
- Employee
- Customer
- Spare Parts**
- System Log
- Report
- Log Out

SpareParts

Administrator


Part ID
Part Name

Part Description
Part Cost

Add
Update
Delete

PartID	PartName	PartDescription	PartCost
19	Spark Plug	A small device for ignition	2000
20	Oil filter	Removes impurities from oil	5000
21	Brake Pad	Friction material for braking	6500
22	Fuel pump	Delivers fuel to engine	10000
23	Air filter	Filters dust from air intake	5000
24	Shock Absorber	Dampens vehicle's vibrations	12000
25	Front Bumper	Protects front of the vehicle	15000
26	Hood	Covers the engine	20000
27	Door	enter/exit points of vehicle	25000

System Log Window:



- Vehicle
- Vendor
- Employee
- Customer
- Spare Parts
- System Log**
- Report
- Log Out

SystemLog

Administrator

Users Session Log

SessionID	Usertype	UserID	Username	LoginTime	LogoutTime
82	Administrator	1	admin	6/21/2023 3:42 AM	
81	Administrator	1	admin	6/21/2023 3:33 AM	6/21/2023 3:33 AM
80	Administrator	1	admin	6/21/2023 3:33 AM	6/21/2023 3:33 AM
79	Employee	3	Zain	6/21/2023 3:26 AM	6/21/2023 3:27 AM
78	Administrator	1	admin	6/21/2023 3:17 AM	6/21/2023 3:18 AM
77	Administrator	1	admin	6/21/2023 3:12 AM	6/21/2023 3:14 AM
76	Administrator	1	admin	6/21/2023 3:11 AM	6/21/2023 3:11 AM
75	Administrator	1	admin	6/21/2023 3:10 AM	6/21/2023 3:10 AM

All Tables Log

AuditID	TableName	TableID	ModifiedBy	ModifiedDate	Operation
71	Sale	1	Zain	6/21/2023 3:01 AM	DELETION
70	Vehicles	9	Zain	6/21/2023 3:01 AM	UPDATION
69	Vehicles	12	Zain	6/21/2023 3:01 AM	UPDATION
68	Sale	2	Zain	6/21/2023 3:01 AM	ADDITION
67	Vehicles	8	Askari	6/21/2023 2:59 AM	UPDATION
66	Vehicles	8	Askari	6/21/2023 2:57 AM	UPDATION
65	Vehicles	12	Askari	6/21/2023 2:56 AM	UPDATION
64	Repairs	10	Askari	6/21/2023 2:56 AM	UPDATION

11

Conclusion:

As a result, the database project for Blaze Wheel, our innovative vehicle management system, has successfully met its goals of delivering a strong, effective, and secure data architecture. To ensure seamless data administration and support data-driven decision-making, we have concentrated on creating an organised database schema, utilising cutting-edge technology, and putting best practises into practise throughout this project.

Critical car-related data, such as vehicle details, maintenance history, maintenance/repair prices, and more, can now be efficiently stored and retrieved thanks to the database project. We have achieved ideal performance, assuring quick data access and low latency, by carefully developing the database schema and utilizing effective indexing algorithms.

In conclusion, the Blaze Wheel database project has been effective in giving our vehicle management system a solid, safe, and scalable foundation. We have built an architecture that enables you to streamline operations, acquire actionable insights, and make data-driven decisions to optimise the performance of your fleet and develop your business. We did this by using cutting-edge technology and putting best practices into practise.

As your fleet changes and grows, we are convinced that the Blaze Wheel database project will continue to meet your objectives for vehicle management by providing dependability, efficiency, and security.