

Unveiling a Website Development for Car Inquiry

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Summary

Due to the car's central role in modern life, the industry has become more fiercely competitive, with each manufacturer doing everything it can to attract buyers with features like plush interiors, comprehensive warranties, and helpful customer service departments. Customers may not have the luxury of buying a new car, so they will have to buy a used car. Nevertheless, in most cases, the customer (car driver) may be deceived about the vehicle information and history and thus will be confused in making his/her decision to purchase. In addition, after all attempts to obtain vehicle information (plate number, model, year of manufacture, number of maintenance times, accidents, etc.), the customer's many attempts may fail. In general, the government records and verifies the information of all cars, even those that pass through their borders. However, there might still be some trouble in obtaining this information. From this standpoint, we will design a website that makes it easier for car drivers, car companies and governments to carry out all the above-mentioned processes. It will also allow users, whether a driver or a car company, to inquire about all vehicle information through detailed and integrated reports on its condition since its entry into the Kingdom of Saudi Arabia until the present time, in addition to information supported by numbers and statistics to ensure the integrity and reliability of the information. This platform will save the trouble of searching for car information for drivers and car companies. It will also help governments keep track of the information of all cars entering and leaving the Kingdom of Saudi Arabia, which will contribute to facilitating the process of viewing the history of any car that has previously entered the Kingdom's borders.

Keywords:

Car Inquiry, Wamp Server, Visual Paradigm, Visual Studio.

1. Introduction

Obtaining vehicle and vehicle history information is important to many entities (automobile companies, drivers looking for vehicles to purchase and other drivers interested in vehicle information, governments). This information is useful in obtaining a general idea of its specifications, condition, readiness, whether it is valid for use or not, a public or private car, and other information that may be useful in making decisions later.

With the development of information collection and tracking methods, many attempts have been made to provide this information to ensure customer satisfaction.

A car history report is a set of records that give information about some used car. This report can help in

affecting or encouraging the decision of purchasing the car or how much is enough money for it. Usually, all information about the vehicle is collected during its lifetime from different sources (official and unofficial) as they help in answering many crucial questions such as:

- Ownership: identifies the number of people who owned this car.
- Accident(s): identifies whether the car was involved in an accident.
- Mileage: identifies whether the odometer on this car shows accurate mileage or not.
- Inspections: identifies whether this car has up-to-date inspections or not.
- Lemon: identifies whether this car has been branded a Lemon or not.

This article can help both the seller of the used car and the buyer. When the individual wants to buy a car, the history of this car can help in knowing whether the car has issues or not. On the other hand, when an individual wants to sell one, he/she has to show his/her history report in order to facilitate the selling process.

To obtain a car history, the Vehicles Identification Number (VIN) is needed (17-digit number). It can be found on the side of the driver on the dashboard closer to the windshield [1], [2].

The information provided in a car history facilitates the process of understanding the individual's interests in buying or selling. It will give a clear view of details that they should consider and think of. These details are [1]:

- Major Accident.
- Multiple Owners.
- Structural Damage.
- Vehicle Service History.
- Lease, Personal, Taxi, or Police Use.
- Total Loss.
- Rebuilt.
- Airbag Deployment.
- Branded a Lemon.
- Last Reported Mileage.
- Junked.
- State-Owned.
- Length of Ownership.
- Estimated Miles Driven Per Year.
- Warranty Information.

The objective of this article is to design a platform in the form of a website, which will be a guiding tool that helps people who wish to verify the vehicle's past as well as displaying all information related to the history of the car, such as:

1- Maintenance carried out on the car (number of maintenances; report on its condition, company that carried out maintenance, main parts that have been changed).

2- Specifications of the car (vehicle model, chassis number, color, weight, manufacturing date).

3- Violations (type of violation, status, date, number, picture of violation).

4- Accidents (number, damaged side, photo of accident, liability and fault percentage, date, location, Spare parts damaged, estimated cost of damage).

5- Selling suggestions (price range in the market, price range in auctions, suggested purchase price).

6- Owners (number of owners, kilometers per owner).

7- The date of entry of the vehicle to Saudi Arabia.

8- The license expiry date.

9- The number of periodic inspections and the result of the last vehicle inspection.

10- The name of the insurance company and the date of the beginning and end of the insurance.

11- The number of authorizations for the vehicle.

12- Number of summons from the agency (date, reason).

13- Number of circulars about the car.

14- The number of times the ownership of the car was transferred.

15- Find out if the car has been registered as damaged.

16- Find out the agency's repurchase of the car.

17- Find out if the car belongs to a company.

18- Find out if the car is a police car.

19- Find out if the car is a taxi.

20- Find out whether the car belongs to a car rental company.

2. Related Works

2.1 Existing Systems

This section provides the literature on the existing systems that are similar to the proposed work.

2.1.1 Vehicle History

This platform is one of the most trusted platforms for inquiries about used cars in the United States of America as shown in Figure 1. It helps buyers to choose a suitable car through hundreds of reviews about cars. The reviews available on the website are well-studied and evaluated. The website provides information about cars especially the ones that have been used for several years [3].

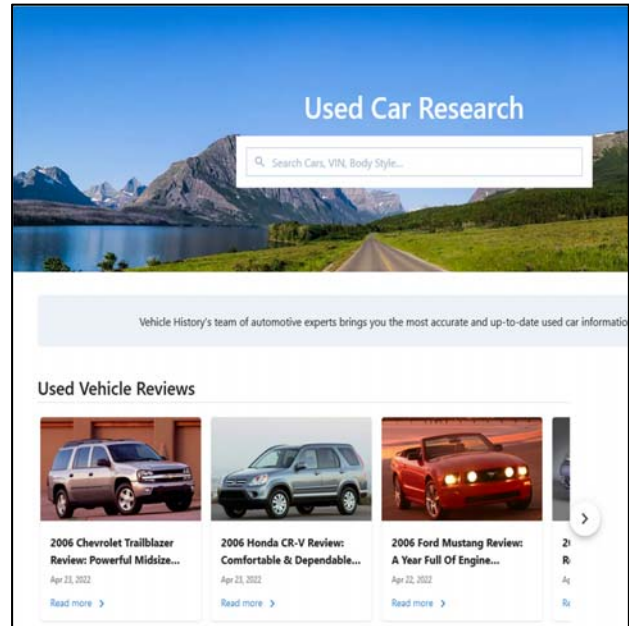


Fig. 1 Vehicle History Website.

❖ Advantages:

- Allows search for used cars.
- Allows information about car history.

❖ Disadvantages:

- Available only in the USA.
- Does not provide details about previous owners.
- Does not provide details about accidents and maintenance.
- Does not provide details about violations.
- Does not support inquiries about cars in the Kingdom of Saudi Arabia.

2.1.2 CarFax

This platform is a part of S&P Global, which is one of the best entities that provide ratings and analytics about vehicles as displayed in Figure 2. It is considered as a leader in vehicle history and information whether it was for a buyer or a seller. It has an enormous database in North America and has over 130000 data sources.

The website provides reports that contain accident and damage indicators, total loss accident history, odometer readings, number of owners, service records, and vehicle use (taxi, rental, lease, etc.) [4].

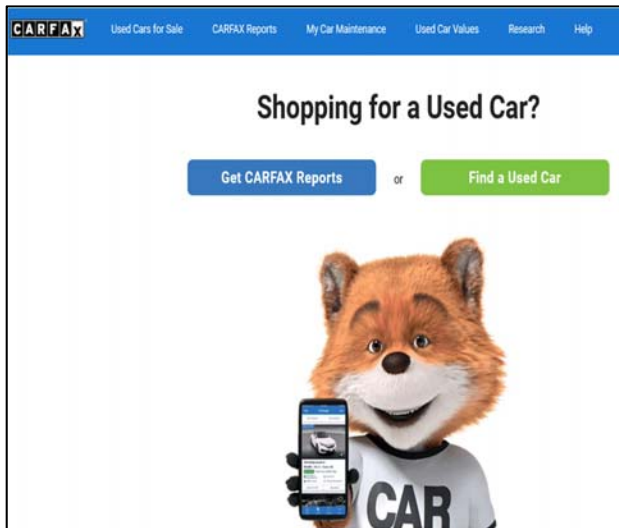


Fig. 2 CarFax Website.

❖ Advantages:

- Allows search for used cars.
- Allows information about car history.
- Provides details about accidents, maintenance and previous owners.

❖ Disadvantages:

- Available only in North America.
- Does not provide details about violations.
- Does not support inquiries about cars in the Kingdom of Saudi Arabia.

2.1.3 Hukoomi

Hukoomi is a website directed to the Qatar people as shown in Figure 3. It provides drivers with information and history about cars such as (vehicle type, plate number, chassis number, chassis, engine number, owner name, registration expiry date, model, color, etc.) [5].

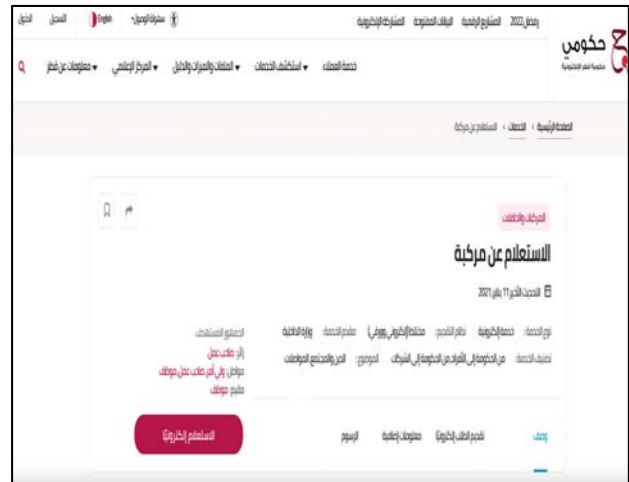


Fig. 3 Hukoomi Website.

❖ Advantages:

- Allows inquiries for cars.
- Allows information about car history.
- Provides details about car model, chassis number, color, type of use, etc.

❖ Disadvantages:

- Available only in Qatar.
- Does not provide details about accidents, maintenances and previous owners.
- Does not support inquiries about cars in the Kingdom of Saudi Arabia.

2.2 Limitations of Existing Systems

The previous systems had many incompatibilities and limitations such as the inability to inquire or search for cars within the grounds of the kingdom of Saudi Arabia as shown in Table 1.

Table 1: Comparison between Related Works and the Proposed Website

	<i>Vehicle History</i>	<i>CarFax</i>	<i>Hukoomi</i>	<i>The Proposed Website</i>
Free/Paid	Free	Free	Free	Free
Supports Search for cars inside the kingdom of Saudi Arabia	No	No	No	Yes
Provides detailed report about car history	Yes	Yes	Yes	Yes
Provides statistical graphs	No	No	No	Yes
Provide Price suggestions	Yes	Yes	No	Yes
Provide information about previous owners	No	Yes	No	Yes
Provide information about previous accidents	No	Yes	No	Yes
Provides information about previous maintenance	No	Yes	No	Yes
Provides information about odometer readings	No	Yes	No	Yes
Provides information about vehicle use (taxi, rental, police car, etc.)	No	Yes	Yes	Yes
Cars are limited to one company	No	No	No	No

In addition, these systems do not offer statistics in the form of graphs, which is beneficial for researchers and studies regarding this aspect. Moreover, they do not provide information about previous maintenance of the car and do not provide information on cars from other brands, meaning the information is limited to one car company only.

After studying the related works, and defining their shortcomings and limitations, this section will provide a comparison of these works and the proposed system to highlight the features of it against these works. It will help to give insights about the website and its value to users.

2.3 The Proposed Solution

The proposed solution is a platform for all types of users that can facilitate the process of inquiring about car history and provide reliable information as the government is the sole entity that records this information. It will be a website that is dedicated to people in the Kingdom of Saudi Arabia.

2.4 The Methodology Steps

This article will follow a number of steps to obtain the final product, which is the website. These steps are called the development methodology. In this section, we will present a brief definition of the development methodology, then define the model (the steps) that we will be following to implement the system.

2.4.1 Development Methodology

Before performing the system analysis, the software development methodology should be identified to help build a better software system. First, this section will provide a brief definition of the software development methodology.

Software development methodology is a set of processes that are structured and organized when working on a system. It aims to present an approach that is convenient and systematic to develop software, as well as a platform for developers to work efficiently in teams. Software development methodology defines how the data and information are shared between team members [6].

It is essential to follow a methodology throughout the system as it helps developers deal with customers' requests for change. It also prevents wasting time, effort, money, and resources on implementing software that is not up to the customer's expectations and helps in reducing inefficiencies and in providing an accurate timeline for delivering the final product.

2.4.2 Waterfall Model

This model follows a stable sequence of stages in implementing the systems. It is very popular because it is clear and well-defined and the requirements are clearly defined from the start, thus everyone knows their tasks in the system, and developers can easily spot errors at the design stage to avoid programming errors in later stages [7].

It is very easy to predict and estimate the cost of the system using this methodology as well as its progress and shortcomings. The model is divided into six steps/stages: Planning, Analysis, Design, Implementation, Testing, and Maintenance. Figure 4 illustrates these stages.

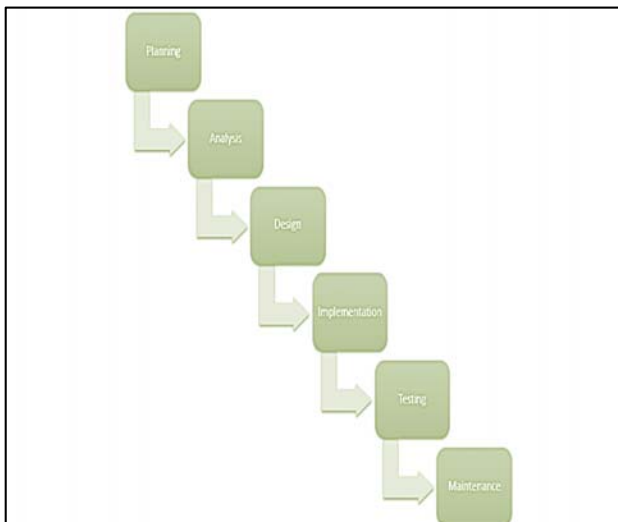


Fig. 4 Waterfall Methodology.

The output of each phase is an input to the following one. The steps for implementing the system are as follows:

- **Planning:** this includes gathering all requirements and features of the system's utility.
- **Analysis:** includes investigating the problem in order to define the necessary procedures to solve it.
- **Design:** it is divided to logical design and physical design and it includes finding solutions based on requirements.
- **Coding:** coding is also called implementation; it includes writing the actual code of the system that transforms the system specifications into a software.
- **Testing:** it is performed to ensure the system is functioning properly.
- **Maintenance:** ensures the system is running smoothly and free of defects that were not observed in the testing phase.

The output of this approach is a completely functioning software whether it was an application or a website.

3. System Analysis and Requirements

This section will provide the requirements of the proposed website by first offering a brief definition of requirement analysis then defining actors in the system, then analyzing the functional and non-functional requirements. In addition, it will provide an overview of the website by drawing a use-case of the system.

3.1 Requirement Analysis

Requirements are a description of the service that the software must provide. They describe the solution that has to be developed, including its functionality, design, and user experience. These are usually formulated by the customer or stakeholders whom are the people who participate in or are affected by the system. Therefore, they care about its success. When designing application there are many ways to classify the requirements, such as functional requirements, non-functional requirements, software, and hardware requirements.

3.1.1 Defining Actors in the System

An actor is an entity in the system that indicates a role played by the user. Ultimately, an actor is a role played by human beings who interact with the system. A system can have more than one actor that triggers or initiate a use case. The proposed system/website has four actors, they are:

- User.
- Admin.
- Car Company.
- Government.

3.1.2 Functional Requirements

They are requirements the system should provide. They define how the system reacts to particular inputs and how the system behaves in particular situations. They describe functionality or system services, and they depend on the type of software, expected users, and the type of system where the software is used. The requirements of the proposed system are as follows:

Users must be able to:

- Register.
- Login.
- Logout.
- Inquire about car history (this necessitates entering car numbers and results in a history report).

Government must be able to:

- Register.
- Login.
- Logout.
- Add the car.
- Remove the car.
- Add car information (number, violations, number of maintenances, price, date of entering and leaving the Kingdom and the state from which they entered the Kingdom, etc.).

Car Company must be able to:

- Register.
- Login.
- Logout.
- Inquire about car history (this necessitates entering the car number).
- Inquire about most sold cars.

Admin must be able to:

- Login.
- Log out.
- Manage users (this includes adding or suspending users).

3.1.3 Non-Functional Requirements

There are some requirements that are not related to the functionality of the software but have to be met in order for the software to work as a whole, some of these are outlined in:

- Security: The database has to be secure to avoid unauthorized access.
- Scalability: The system will begin providing its service to a certain number of users but with time, it must be upgraded to serve a larger number of users.
- Extensibility: The system should be able to provide a larger the number of services.
- Traceability: The system should provide on request, details of car history.
- Integrity of information: The data contained in the database system must be protected. Data must not be redundant.
- Flexibility: The system should be able to adapt to requirements of a dynamic environment.
- Usability: the user should be able to use the system easily and interfaces must not be complex and hard to understand.

3.2 Requirements Specifications

3.2.1 Overview of the System

The proposed system is a website that facilitates obtaining car information for car drivers, car companies, and governments. The website also allows users to inquire about all vehicle information through detailed and integrated reports on its condition since its entry into the Kingdom until the present time, in addition to information supported by numbers and statistics to ensure the integrity and reliability of the information. This website saves the trouble of searching for car information for drivers and car companies and helps governments keep track of the information of all cars entering and leaving the Kingdom. Lastly, the website contributes to facilitating the process of viewing the history of any car that has previously entered the Kingdom's borders.

3.2.2 Use Case Diagram

The purpose of use-case diagram is to present the core functionalities and provide a good high-level analysis from outside the system. Use-case diagram explains what the system and its functionality is, using actors and use-cases as shown in Figure 5. A use-case describes the sequence of actions that system performs to achieve visible results.

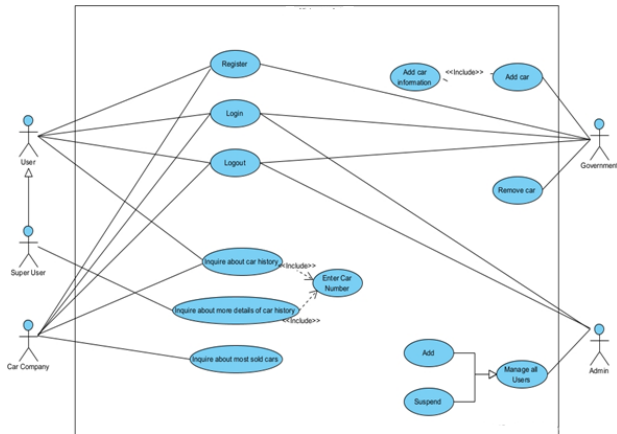


Fig. 5 Use-case Diagram.

The scenarios are represented in Table 2-9 as follows:-

Table 2: Register Use-case Scenario.

Use case name	Register
Description	Users can register on the website by entering their data (such as username, full name, e-mail and password),
Actors	User, Super User, Car Company, Government
Preconditions	None
Main Sequence	Press on Register. Enter information (name, e-mail and password, user type) Press Register button.
Alternative Sequence	The user did not enter his data correctly or the user did not enter all required data, thus the system will display error message.
Post-condition	User is registered successfully and the database is updated.

Table 3: Login Use-case Scenario.

Use case name	Login
Description	Actor log into the website by entering email and password
Actors	Admin, User, Super User, Car Company, Government
Preconditions	All actors are already registered on the website.
Main Sequence	Press on Login. Enter information (e-mail and password) Press Login button.
Alternative Sequence	The actor entered a wrong email or password, thus the system displayed error message.
Post-condition	The actor is logged in

Table 4: Enquire About Car History Use-case Scenario.

Use case name	Inquire about car history
Description	Users and super users can Enquire about car history by entering car number
Actors	User, Super User, Car Company
Preconditions	User, Super User, Car Company are already registered on the website and are logged in.
Main Sequence	Press on enquire about car history Enter car number Press 'search' button.
Alternative Sequence	The user entered a can number that is not in the database, thus the system displays 'not found'
Post-condition	The report is displayed on the website

Table 5: Inquire about More Details of Car History Use-case Scenario.

<i>Use case name</i>	<i>Inquire about more details of car history</i>
Description	Super User can inquire about more information of car history
Actors	Super User
Preconditions	Super User is already registered on the website and is logged in.
Main Sequence	Press on enquire about more information of car history Enter car number Press 'search' button.
Alternative Sequence	None
Post-condition	The report is displayed on the website

Table 6: Inquire About Most Sold Cars Use-case Scenario.

<i>Use case name</i>	<i>Inquire about most sold cars</i>
Description	Car Company can Inquire about most sold cars
Actors	Car Company
Preconditions	Car company is already registered on the website and is logged in.
Main Sequence	Press on 'most sold cars' Browse report.
Alternative Sequence	None
Post-condition	Information is displayed on the website

Table 7: Add Car Use-case Scenario.

<i>Use case name</i>	<i>Add car</i>
Description	Government can add cars to the data base by pressing add car button
Actors	Government

Preconditions	Government is already registered on the website and is logged in.
Main Sequence	Press on add car Enter car information Press save
Alternative Sequence	The Government cancelled adding car, thus the car history information will not be added to the database
Post-condition	Car is added successfully and the database is updated

Table 8: Remove Car Use-case Scenario.

<i>Use case name</i>	<i>Remove car</i>
Description	Government can remove cars to the data base by pressing remove car button
Actors	Government
Preconditions	Government is already registered on the website and is logged in.
Main Sequence	Press on remove car Confirm removal
Alternative Sequence	The Government cancelled removing car, thus the car will not be removed from the database
Post-condition	Car is removed successfully and the database is updated

Table 9: Manage All Users Use-case Scenario.

<i>Use case name</i>	<i>Manage All Users</i>
Description	Admin can manage all users on the website through suspending or adding a user
Actors	Admin
Preconditions	Admin is already logged in
Main Sequence	Press on 'manage users'. Press on Add/suspend user If pressed on add user, enter user information. And if pressed on suspend user then confirm suspension Confirm operation

Alternative Sequence	Admin did not confirm the process, thus users are not added/suspended.
Post-condition	Users are added/suspended successfully and the database is updated.

4. System Design

In this section, there is an inclusion of system structures and processes, from system architecture to object-oriented designs which are divided into Static Hierarchical Diagrams (ERD) and behavioral dynamic diagrams (activity diagrams). Next, data modeling which is the design of the data dictionary and the databases is presented.

4.1 System Components

The system is composed of the following components as illustrated in Figure 6:

- The system users who are the government, the normal user, the admin, and the car company.
- The website, which will be developed at the end of this system.
- A Wi-Fi network to enable the connection to the internet.
- A server that connects users to the database in order to perform the inquiry, add, delete and modification processes and commands.
- A database to store all information related to the cars and the users of the website.

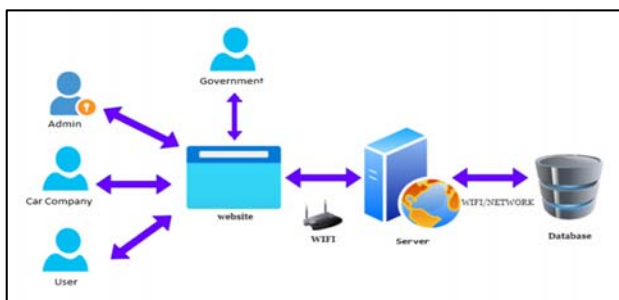


Fig. 6 System Components.

Visual Paradigm program is used to design the UML Diagrams [8], [9]. Visual Studio Code editor is used to code the systems functions and interfaces. WampServer is used to create dynamic web applications and to tune the server [10].

4.2 Interface Implementation

The investigation stage of user interfaces is one of the most important stages during the process of implementing the system. Therefore, it is the basis for the user’s communication with our system, and it strongly affects the user’s acceptance of the site that has been designed, in addition to being the essence of attraction, whether with eye-friendly colors, interactive interfaces, or even the aesthetics of icons and buttons. In this section, the user interfaces that have been achieved will be shown with a brief explanation of each.

4.2.1 Sign-Up Interface

This interface is intended for users who want to create an account on the site to allow them to perform queries and other operations as shown Figure 7. It contains text boxes for entering name, email and password. It also contains a set of options in the form of radio buttons to determine the type of user. When all information is entered, the user presses, "Enter" to complete the registration process.



Fig. 7 Sign-Up Interface.

4.2.2 Sign-In Interface

This interface allows users to log in to the site by entering their email and password as illustrated in Figure 8. In the event that the user does not have an account already, he only has to press the registration button to be directed to the sign up interface.



Fig. 8 Sign-In Interface.

4.2.3 User Homepage

This interface allows ordinary users to make inquiries about the vehicles they want to obtain information about by entering the chassis number of the vehicle and pressing the "Search" button as shown Figure 9.



Fig. 9 User Homepage.

4.2.4 User Inquiry Interface

This interface allows users to make inquiries about the vehicles they want to get information about, accidents, insurance, specifications, and finally the owners as shown Figure 10. It also allows users to report a vehicle through the "Report" button.



Fig. 10 User Inquiry Interface.

4.2.5 Report of the Car Interface

This interface shows a full report about the car that the user inquired about in the previous interface in Figure 10, which includes the type of car, its specifications, and the accidents that it has previously experienced, in addition to the location of the damages, the location where the accident occurred, and a picture of it as shown Figure 11.



Fig.11 Report of the Car Interface.

4.2.6 Government Homepage

This interface allows the government to make inquiries about the reports on vehicles by entering the chassis number of the vehicle and pressing the "Search" button as shown Figure 12. It also allows the government to add new cars to the website.



Fig. 12 Government Homepage.

4.2.7 Government Add Car Interface

This interface allows government to add cars to the website by choosing the manufacturing company and entering the chassis number of the car as revealed Figure 13. The operation is completed by pressing “add” button.



Fig. 13 Government Add Car Interface.

4.2.8 Government Add Car Information Interface

After adding the car chassis number and company, the government needs to enter other car information such as maintenance date, Maintenance Company, parts that have been changed, owners, walkway, insurance start and expiry date and finally insurance company as displayed Figure 14-15 respectively.



Fig. 14 Add Car Information-1.

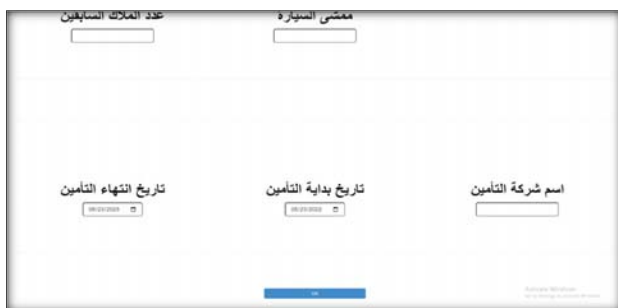


Fig. 15 Add Car Information-2.

4.2.9 Admin Homepage

This interface is where the manager is directed after signing in to the site, through which he can manage the components and data of the site and its users, where he/she can add a user, government, company, a new car, and he/she can also manage user accounts as exposed in Figure 16.

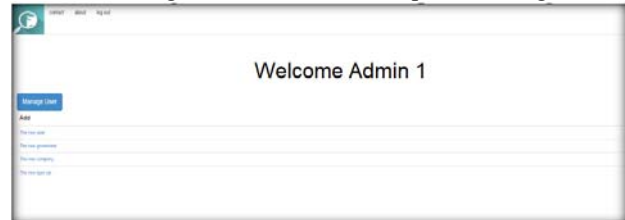


Fig. 16 Admin Homepage.

4.2.10 Admin Manage Users Interface

This interface appears after the admin presses the "Manage Users" button in Figure 16, and this window appears which contains a list of users' names and information. In addition to the possibility of modifying the user's information by pressing the "Change" button as shown Figure 17.

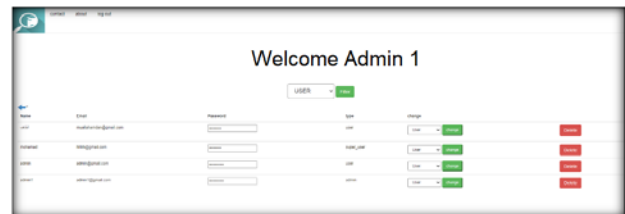


Fig. 17 Admin Manage Users Interface.

4.2.11 Admin Add User Interface

This interface appears after the admin clicks on the "new user" link in Figure 16, which allows him to add new users to the site and add their account information such as name, email and password as displayed Figure 18.



Fig. 18 Add New User By The Admin Interface.

4.2.12 Admin Company Interface

This interface allows the admin to manage companies' accounts on the site and also allows him to mark this company as "inactive" or "inactive." This interface provides other options such as previewing the company's dashboard or deleting it from the site as shown Figure 19.



Fig. 19 Admin Company Interface.

4.2.13 Contact Interface

This interface allows users to communicate with the administration in the event of any complaints, suggestions, or even inquiries about technical issues within the site as revealed Figure 20.



Fig. 20 Contact Interface.

4.2.14 About Interface

This interface provides information about the site, such as an overview of the site and the services it provides Figure 21.



Fig. 21 About Interface.

4.3 Entity Relation Model

4.3.1 Entities in the Proposed System

The entities in the proposed system are:

- The user who has the following attributes: id, name, email, and password.
- The car that has the following attributes: id, serial number, type, name, color, result, and government name.
- The car type that has the following attributes: id, name, company id, user id.
- The government that has the following attributes: id, name, email, and password.
- The car company that has the following attributes: id, name, email, and password.
- The admin who has the following attributes: id, name, email, and password.

4.3.2 Relations between Entities

The previously mentioned entities in in the system are related according to the following:

- User-Car relation: this relation is between the user and the car and is defined as: "the user inquires about the car".
- User-Admin relation: this relation is between the user and the admin and is defined as "the admin manages the users".
- Admin-Car relation: this relation is between the admin and the car entity and is defined as "the admin manages the cars".
- Admin-Company relation: this relation is between the admin and the company entity and is defined as "the admin manages the company".
- Admin-Government relation: this relation is between the admin and the government entity and is defined as "the admin manages the government".
- Government-Car relation: this relation is between the government and the car entity and is defined as "the government adds/removes the cars".
- Government-Car type relation: this relation is between the government and the car type entity and is defined as "the government adds/removes the car types".
- Company-Car relation: this relation is between the company and the car entity and is defined as "the government inquires/has cars".

4.3.3 ER Diagram

The ER diagram defines the relationship between a group of entities, which are stored in the database, and it explains the logical structure of the database as displayed in Figure 22.

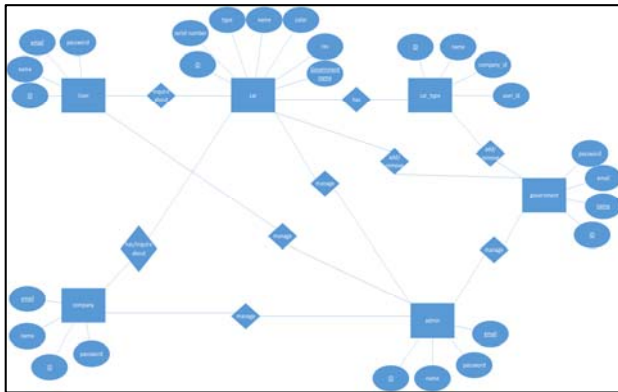


Fig. 22 ER Diagram.

4.4 Data Dictionary

The data dictionary contains information about the database and its contents. It provides insight into the structure and components of the database such as the names of the tables, their details such as constraints and location and, the views that are visible. The tables in the database represent objects, which contain the entire data in the database. These tables are organized in rows and columns where rows refer to unique records and columns refer to unique features/fields in every record. Tables 10-15 represent the data dictionary for every table in the database:

Table 10: User Table

#	Column Name	Data Type	Note
1	ID	int (10)	Primary key/auto increment/not null
2	name	varchar(20)	Not null
3	Email	varchar(50)	Primary key/Not null
4	Password	varchar(8)	Not null
5	Admin_id	int (10)	Foreign key/Not null

Table 11: Company Table

#	Column Name	Data Type	Note
1	ID	int (10)	Primary key/auto increment/not null
2	name	varchar(20)	Not null
3	Email	varchar(50)	Primary key /Not null
4	Password	varchar(8)	Not null
5	Admin_id	int (10)	Foreign key/Not null

Table 12: Admin Table

#	Column Name	Data Type	Note
1	ID	int (10)	Primary key/auto increment/not null
2	name	varchar(20)	Not null
3	Email	varchar(50)	Primary key /Not null
4	Password	varchar(8)	Not null

Table 13: Government Table

#	Column Name	Data Type	Note
1	ID	int (10)	Primary key/auto increment/not null
2	name	varchar(20)	Primary key /Not null
3	Email	varchar(50)	Not null
4	Password	varchar(8)	Not null
5	Admin_id	int (10)	Foreign key/Not null

Table 14: Car Table

#	Column Name	Data Type	Note
1	ID	int (10)	Primary key/auto increment/not null
2	Serial_number	int (10)	Foreign key/Not null
3	Type	varchar(50)	Not null
4	name	varchar(50)	Not null
5	Color	varchar(20)	Not null
6	res	Text	Not null
7	Admin_id	Int(10)	Foreign key/Not null
8	Company_id	Int(10)	Foreign key/Not null
9	Government_name	varchar(50)	Primary key /Not null

Table 15: Car Type Table

#	Column Name	Data Type	Note
1	ID	int (10)	Primary key/auto increment/not null
2	Name	text	Not null
3	Company_id	Int(10)	Foreign key/Not null
4	User_id	Int(10)	Foreign key/Not null

5. Conclusion

In this article, we were able to design a website to inquire about vehicles, which includes a number of users. The ordinary user is the person who can make an inquiry about the desired car by entering its chassis number. The car company can inquire about its cars in the same way. The government can add all the cars that pass across the border into or out of the Kingdom by adding its information (such as the chassis number, the type of car, and other information related to guarantee, accidents, and insurance). Finally, the site manager can manage users within the site as well as supervise the data related to them and receive messages that are sent by previously mentioned users regarding technical problems, inquiries, or other. We have been aiming by designing the website to provide ease of inquiry to citizens and companies and to provide effort and transactions that can follow the process of querying any vehicle. Our goal is to provide all the information an individual could need to help a person to make a car purchase decision. When thinking about our near-future plan, we target to: improve the way information is displayed within the site (which was implemented in this way due to time limitations), improve interfaces to become more aesthetic, add a review of the site's services, and confirm account registration with verification code.

References

- [1] Check Any VIN - It's Free | Free Vehicle History and VIN Check, <https://www.vehiclehistory.com/> (accessed Sep. 24, 2022).
- [2] Roman, R., Dagmar, K., Vladimir, S., Vladimira, H. & Frantisek, V: *Questions of the influence of quality VIN on the safety of vehicle operation from the point of view of critical information systems*, Cogent Engineering (2022).
- [3] Vehicle History Report: Everything You Need to Know - Kelley Blue Book., <https://www.kbb.com/car-advice/vehicle-history-report/> (accessed Sep. 24, 2022).
- [4] CARFAX™ - Shop, Buy, Own, & Sell Used Cars., <https://www.carfax.com/> (accessed Sep. 26, 2022).
- [5] Inquire-About-Vehicle, <https://hukoomi.gov.qa.https://hukoomi.gov.qa/ar/service/inquire-about-vehicle> (accessed Sep. 26, 2022).
- [6] 8 Best Software Development Methodologies, <https://www.uptech.team/blog/software-development-methodologies> (accessed Sep. 30, 2022).
- [7] Software Development Process: How to Pick the Process That's Right for You, *Planio*. <https://plan.io/blog/software-development-process/> (accessed Sep. 30, 2022).

- [8] Visual Paradigm 10.0 (formerly VP-UML 10.0) Released. <https://www.visualparadigm.com/cn/aboutus/newsreleases/vpuml100.jsp> (accessed Apr. Oct. 10, 2022).
- [9] Carsten, M., Anton, P.: *Plugin for Visual Paradigm for Generating and Intelligent Optimization of a Component Diagram Based on Attributes in the Class Diagram*, Journal of Software (2015).
- [10] WampServer, <https://www.wampserver.com/en/> (accessed Oct. 10, 2022).

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