Vehicle Damage Accessor

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1. INTRODUCTION

1.1 OVERVIEW OF THE PROJECT

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The Vehicle Damage Assessor (VDA) route is intended for individuals whose job role involves the estimating of vehicle damage repairs which are involved in accidents or similar incident circumstances. Vehicle Damage Assessor The individual should be working in the accident repair sector of the industry and have at least three years experience to ensure they are familiar with the skills, knowledge and techniques required to determine the vehicle damage, identify the correct safe repair method to return the vehicle back to its pre accident condition.

The Vehicle Damage Accessor Project aims to develop an innovative solution for predicting and assessing damage to vehicles using machine learning and computer vision technologies. Accurate and efficient damage assessment is crucial for insurance companies, auto repair shops, and vehicle owners.

Those wishing to achieve ATA VDA accreditation will be required to use the following method:

♣ **Full Assessment**

The individual is measured by a skill and knowledge test. The knowledge test, referred to as 'Part A', must be completed before the practical assessment, referred to as 'Part B'.

For those wishing to retain their accreditation i.e. those who hold a valid ATA VDA card in that route there are two options, these are:

♣ Full Assessment

♣ AOM Update

In order to re-accredit using 'AOM Updates' (Assessed Outcome Modules) the candidate's ATA ID Card must remain valid throughout the assessments and until all of the prescribed AOMs have been passed. Should the card expire beforehand, the candidate will be required to re-take a 'full assessment'.

The module is to ensure that the candidate can accurately record the details of the vehicle incident and driver customer. From the information provided the candidate should be able to determine from the actual vehicle damage information provided by the driver / customer matches the incident circumstances. This will inform the VDA to accurately assess the vehicles condition and the repair process. To ensure that the candidate can consistently achieve the accuracy of the information required, the candidate will be practically assessed using two physical vehicles.This qualification is perfect if your job role involves the repair of vehicles typically involved in accidents or similar incident circumstances**.**IMI Accreditation was created to help the motor industry keep on top of constant, rapid changes in technology, legislation and working methods, by encouraging and measuring the current competence, knowledge and ability of those working within it.By providing proof of current competence, IMI Accreditation benefits both individuals and their employers.

Please note:

- The main objective of this system is to provide best services to the customer , increasing working capacity , accuracy in objects and many more…

- With its accurate result it is easy for the service provider to work on vehicles…

- With this system we can detect the damaged parts and also estimate the range of amount to service the vehicle…

1.2 MODULE DESCRIPTION

The module is to ensure that the candidate can accurately record the details of the vehicle incident and driver customer. From the information provided the candidate should be able to determine from the actual vehicle damage information provided by the driver / customer matches the incident circumstances**.**

Accreditation Module Title	Establishing Vehicle Damage Circumstances
Module Code	ATA - AOM - 050
Version	02/04/2012 Issue 1.0
Practical Assessment Time	0.50 hours
On-line Knowledge Test	N/A
IMI AOM level	3

Candidate Profile
The candidate should be working in the accident repair sector of the industry and have at least three years experience to ensure they are familiar with the skills, knowledge and techniques required to determine the vehicle damage, identify the correct safe repair method to return the vehicle back to its pre accident condition.

Links with ATA Routes and Modules	
This module features in:	
ATA Route	**ATA Level**
VDA	Vehicle Damage Assessor

USER MODULE

- User needs to upload the image from where the image is stored.
- At-last it will predict the damaged parts and detect the amount to replace the Product.

1.3 SYSTEM SPEICFICATION

1.3.1 HARDWARE SPECIFICATION

Processor : INTEL core2 dual

Hard Disk : 500 GB

RAM : 4 GB

1.3.2 SOFTWARE SPECIFICATION

Operating system : Windows 10

proCoding Language : PYTHON

Technology Used : Cloud Computing (AZURE)

SOFTWARE FEATURES

About Python:

Python is a very popular general-purpose interpreted, interactive, object-oriented, and high-level programming language. Python is dynamically-typed and garbage-collected programming language. It was created by Guido van Rossum during 1985- 1990. Like Perl, Python source code is also available under the GNU General Public License (GPL).

Python supports multiple programming paradigms, including Procedural, Object Oriented and Functional programming language. Python design philosophy emphasizes code readability with the use of significant indentation**.**

This tutorial gives a complete understanding of Python programming language starting from basic concepts to advanced concepts. This tutorial will take you through simple and practical approaches while learning Python Programming language.

Why Python?

Python is consistently rated as one of the world's most popular programming languages. Python is fairly easy to learn, so if you are starting to learn any programming language then Python could be your great choice. Today various Schools, Colleges and Universities are teaching Python as their primary programming language. There are many other good reasons which makes Python as the top choice of any programmer:

- Python is Open Source which means its available free of cost.
- Python is simple and so easy to learn
- Python is versatile and can be used to create many different things.
- Python has powerful development libraries include AI, ML etc.
- Python is much in demand and ensures high salary

Python is a MUST for students and working professionals to become a great Software Engineer specially when they are working in Web Development Domain.

I will list down some of the key advantages of learning Python:

- **Python is Interpreted**

Python is processed at runtime by the interpreter. You do not need to compile your program before executing it. This is similar to PERL and PHP.

- **Python is Interactive**

You can actually sit at a Python prompt and interact with the interpreter directly to write your programs.

- **Python is Object-Oriented**

Python supports Object-Oriented style or technique of programming that encapsulates code within objects.

- **Python is a Beginner's Language**

Python is a great language for the beginner-level programmers and supports the development of a wide range of applications from simple text processing to WWW browsers to game.

Features of Python

➢ **Easy-to-learn** − Python has few keywords, simple structure, and a clearly defined syntax. This allows the student to pick up the language quickly.

➢ **Easy-to-read** − Python code is more clearly defined and visible to the eyes.

➢ **Easy-to-maintain** − Python's source code is fairly easy-to-maintain.

➢ **A broad standard library** − Python's bulk of the library is very portable and cross-platform compatible on UNIX, Windows, and Macintosh.

➢ **Interactive Mode** − Python has support for an interactive mode which allows interactive testing and debugging of snippets of code.

➢ **Portable** − Python can run on a wide variety of hardware platforms and has the same interface on all platforms.

➢ **Extendable** − You can add low-level modules to the Python interpreter. These modules enable programmers to add to or customize their tools to be more efficient.

CLOUD COMPUTING

Cloud computing is on-demand access, via the internet, to computing resources-applications, servers (physical servers and virtual servers), data storage, development tools, networking capabilities, and more—hosted at a remote data center managed by a cloud services provider .The CSP makes these resources available for a monthly subscription fee or bills them according to usage.

Compared to traditional on-premises IT, and depending on the cloud services you select, cloud computing helps do the following:

- **Lower IT costs:** Cloud lets you offload some or most of the costs and effort of purchasing, installing, configuring, and managing your own on-premises infrastructure.

- **Improve agility and time-to-value:** With cloud, your organization can start using enterprise applications in minutes, instead of waiting weeks or months for IT to respond to a request, purchase and configure supporting hardware, and install software. Cloud also lets you empower certain users—specifically developers and data scientists—to help themselves to software and support infrastructure.

- **Scale more easily and cost-effectively:** Cloud provides elasticity—instead of purchasing excess capacity that sits unused during slow periods, you can scale capacity up and down in response to spikes and dips in traffic. You can also take advantage of your cloud provider's global network to spread your applications closer to users around the world

- **CLOUD TECHNOLOGY (AZURE)**

Microsoft Azure, formerly known as Windows Azure, is Microsoft's public cloud computing platform. It provides a broad range of cloud services, including compute, analytics, storage and networking. Users can pick and choose from these services to develop and scale new applications or run existing applications in the public cloud.

The Azure platform aims to help businesses manage challenges and meet their organizational goals. It offers tools that support all industries -- including e-commerce, finance and a variety of Fortune 500 companies -- and is compatible with open source technologies. This gives users the flexibility to use their preferred tools

and technologies. In addition, Azure offers four different forms of cloud computing: infrastructure as a service (IaaS), platform as a service (PaaS), software as a service (SaaS) and serverless functions.

Microsoft charges for Azure on a pay-as-you-go (PAYG) basis, meaning subscribers receive a bill each month that only charges them for the specific resources and services they have used.

Microsoft provides the following five different customer support options for Azure:

- Basic
- Developer
- Standard
- Professional Direct
- Enterprise (Premier)

Features of AZURE :

The most popular service categories include the following:

Compute. Compute resources created within the Azure cloud can be configured with either public IP addresses or private IP addresses, depending on whether the resource needs to be accessible to the outside world.

Mobile. These products help developers build cloud applications for mobile devices, providing notification services, support for back-end tasks, tools for building application program interfaces (APIs) and the ability to couple geospatial context with data.

Web. These services support the development and deployment of web applications. They also offer features for search, content delivery, API management, notification and reporting.

Storage. This category of services provides scalable cloud storage for structured and unstructured data. It also supports big data projects, persistent storage and archival storage.

Analytics. These services provide distributed analytics and storage, as well as features for real-time analytics, big data analytics, data lakes, machine learning, business intelligence, internet of things (IoT) data streams and data warehousing.

Networking. This group includes virtual networks, dedicated connections and gateways, as well as services for traffic management and diagnostics, load balancing, DNS hosting and network protection against distributed denial-of-service (DDoS) attacks.

Media and content delivery network (CDN). These CDN services include on-demand streaming, digital rights protection, encoding, and media playback and indexing.

Identity. These offerings ensure only authorized users can access Azure services and help protect encryption keys and other sensitive information in the cloud. Services include support for Azure Active Directory and multifactor authentication.

IoT. These services help users capture, monitor and analyze IoT data from sensors and other devices. Services include notifications, analytics, monitoring and support for coding and execution.

DevOps. This group provides project and collaboration tools, such as Azure DevOps -- formerly Visual Studio Team Services -- that facilitate DevOps software development processes. It also offers features for application diagnostics, DevOps tool integrations and test labs for build tests and experimentation.

Development. These services help application developers share code, test applications and track potential issues. Azure supports a range of application programming languages, including JavaScript, Python, .NET and Node.js. Tools in this category also include support for Azure DevOps, software development kits (SDKs) and blockchain.

Security. These products provide capabilities to identify and respond to cloud security threats, as well as manage encryption keys and other sensitive assets.

AI and machine learning. This is a wide range of services that a developer can use to infuse AI, machine learning and cognitive computing capabilities into applications and data sets.

Migration. This suite of tools helps an organization estimate workload Migration costs and perform the actual migration of workloads from local data centers to the Azure cloud.

Management and governance. These services provide a range of backup, recovery, compliance, automation, scheduling and monitoring tools that can help a cloud administrator manage an Azure deployment.

2. SYSTEM STUDY

2.1 EXISTING SYSTEM

- The image of damaged part will be sent to the insurance company and it will be verified by the staff of particular company.
- The snap of the damaged part will be taken by the staff and amount will be estimated by the car company.
- The amount estimated by the insurance company will not be as much accurate as our proposed system.

2.2 PROPOSED SYSTEM

In-order to avoid the limitation in the existing system is being developed.

Once we upload the damage part of the vehicle in this system it gives the accurate results like,

- Which objects get damaged..
- Where the damage occurred..
- What color of the vehicle and so on..
- Which part of the vehicle is damaged,

  eg:- whether it is minor or major damage..

With this information we can easily fix the vehicle and also the give best service to the customer..

2.2.1 ADVANTAGES OF PROPOSED SYSTEM

- ❖ User friendly interface
- ❖ High Efficiency
- ❖ Fast access
- ❖ More Safety Utilization
- ❖ Cost Savings

3. SYSTEM DESIGN

3.1 FILE DESIGN

System design is the process of planning a new system to complement or altogether replace the old system. The purpose of the design phase is the first step inmoving from the problem domain to the solution domain. The design of the system is the critical aspect that affects the quality of the application. System design is also

called top-level design. The design phase translates the logical aspects of the systeminto physical aspects of the system.

3.2 INPUT DESIGN

The data, which is input to a computer – based information system, must be correct. If data is carelessly input and errors enter the system, it will lead to incorrectresults whose consequences will be expensive and embarrassing to the designer. In data processing, the data entry operator often makes errors. This can be controlled byinput design by using menu, interactive dialogue, consistent format etc.

In this system the users are provided with user friendly pages to give the inputand if the user gives any wrong input validations are done and message boxes are provided in the necessary places. The message specified in the message box is specified in a polite and in an informative manner.

System is interactive dialogue, which simplifies the data entry or access, instead of remembering what to enter. User can choose from a list of options and type it in the cursor position. This will reduce the number of corrections while entering the data.

3.3 DATABASE DESIGN

The database design involves creation of tables that are represented in physicaldatabase as stored files. They have their own existence. Each table constitute of rowsand columns where each row can be viewed as record that consists of related information and column can be viewed as field of data of same type. The table is also designed with some position can have a null value.

The database design of project is designed in such a way values are kept without redundancy and with normalized format. Refer the appendix for screen shots of database design.

3.4 OUTPUT DESIGN

The proposed system is a web oriented system and hence it does not provide any reports. The output results are viewed in the web pages itself. Outputs from the computer system are required primarily to communicate the result of processing to users. They are also used to override a permanent copy of the results for later consultation. The output reports and input documents should be documented in termsof data content .

4. SYSTEM TESTING AND IMPLEMENTATION

4.1 TESTING

Testing is a series of different tests that whose primary purpose is to fully exercise the computer based system. Although each test has a different purpose, all work should verify that all system element have been properly integrated and performed allocated function. Testing is the process of checking whether the developed system works according to the actual requirement and objectives of the system.

The philosophy behind testing is to find the errors. A good test is one that has a highprobability of finding an undiscovered error. A successful test is one that uncovers the undiscovered error. Test cases are devised with this purpose in mind. A test caseis a set of data that the system will process as an input. However the data are createdwith the intent of determining whether the system will process them correctly withoutany errors to produce the required output.

Types of Testing

- Unit Testing
- Integration Testing
- Output Testing
- User acceptance Testing
- Performance Testing
- Output Testing

Unit Testing

All modules were tested and individually as soon as they were completed and were checked for their correct functionality.

Integration Testing

The entire project was split into small program; each of these single programs gives a frame as an output. These programs were tested individually; at last all theseprograms where combined together by creating another program where all these constructors were used. It give a lot of problem by not functioning is an integrated manner.

The user interface testing is important since the user has to declare that the arrangements made in frames are

convenient and it is satisfied. When the frames where given for the test, the end user gave suggestion. Based on their suggestions theframes where modified and put into practice.

Validation Testing

At the culmination of the black box testing software is completely assembled as a package. Interfacing errors have been uncovered and corrected and a final series of test i.e., Validation succeeds when the software function in a manner that can be reasonably accepted by the customer.

Output Testing

After performing the validation testing the next step is output testing of the proposedsystem. Since the system cannot be useful if it does not produce the required output.Asking the user about the format in which the system is required tests the output displayed or generated by the system under consideration. Here the output format is considered in two ways. One is on screen and another one is printed format. The output format on the screen is found to be corrected as the format was designed in the system phase according to the user needs. And for the hardcopy the output comesaccording to the specifications requested by the user.

White box testing

White box testing (also known as Clear Box Testing, Open Box Testing, Glass Box Testing, Transparent Box Testing, Code-Based Testing or Structural Testing) is a software testing method in which the internal structure/design/implementation of theitem being tested is known to the tester. The tester chooses inputs to exercise paths through the code and determines the appropriate outputs.

Programming know-how and the implementation knowledge is essential. Whitebox testing is testing beyond the user interface and into the nitty-gritty of a system. This method is named so because the software program, in the eyes of the tester, islike a white/transparent box; inside which one clearly sees.

Definition by ISTQB

- **White-box testing:** Testing based on an analysis of the internal structure ofthe component or system.
- **White-box test design technique:** Procedure to derive and/or select testcases based on an analysis of the internal structure of a component or system.

Black box testing

Black box testing, also known as Behavioral Testing, is a software testing method in which the internal structure/design/implementation of the item being testedis not known to the tester. These tests can be functional or non-functional, though usually functional.

This method is named so because the software program, in the eyes of the tester, is like a black box; inside which one cannot see.

This method attempts to find errors in the following categories:

- Incorrect or missing functions
- Interface errors
- Errors in data structures or external database access
- Behavior or performance errors
- Initialization and termination errors

Definition by **ISTQB**

- **Black box testing:** Testing, either functional or non-functional, withoutreference to the internal structure of the component or system.
- **Black box test design technique:** Procedure to derive and/or select test cases based on an analysis of the specification, either functional or non- functional, of a component or system without reference to its internalstructure.

Acceptance testing

This testing is done to verify the readiness of the system for the implementation.Acceptance testing begins when the system is complete. Its purpose is to provide theend user with the confidence that the system is ready for use. It involves planning and execution of functional tests, performance tests and stress tests in order to demonstrate that the implemented system satisfies its requirements. Tools to specialimportance during acceptance testing include:

Test coverage Analyzer

Records the control paths followed for each test case.

Timing Analyzer

Also called a profiler, reports the time spent in various regions of the code are areasto concentrate on to improve system performance.

4.2 SYSTEM IMPLEMENTATION

The medical management System begins with the following involves variousactivities performed together. These are the System Development Life Cycle

i. Recognition of need

It is the first stage of information system development cycle. The preliminary investigation must define the scope of the project and the perceived constrains, opportunities and directives that triggered the project. As for Clinical Management System, I collected the system requirements through questionnaires and interviewing student and the staff and the problem they facewhen they visit the universities Clinic. I happen to find the following:

The preliminary investigation include the following tasks:

- Listing problems, opportunities and directives.
- Assess project worth.
- Plan the project.
- Present the project and plan.

Feasibility study

The goal of a feasibility study is to evaluate alternative system and to purpose the most feasible and desirable system for development.

These are the following fetures:

- Statement of the problem
- Summarizing of findings and recommendations
- Details of findings
- Recommendations and conclusions

I addressed five types of feasibility study in my research, they include the following.

ii Operational Feasibility

The system is operationally feasible.

1. Time Feasibility

Being a small system and given the period of three months of development, it is timefeasible.

2. Economic Feasibility:

A network-based system requires a lot of equipment such as cables, hubs etc. This requires a lot of initial capital to install the network. On the other hand, it allows sharing of resources and information and centralized administration hence cheaper.

3. Technical Feasibility

Since it is not a complex system, we have the technical feasibility of developing thesystem.

4. Time Feasibility

The system is a small one and hence the time frame of three months allocated for development is enough hence there is time feasibility.

From the above we choose to use a network based database system because as compared to the other strategies, it more feasible. It will contain an interface that is distributed in the network and is connected to a central data-base.

Feasibility study involve cost/benefit analysis. In the process , the cost and benefits are estimated with greater accuracy. If cost and benefit should bequantified to make a good system that is affordable.

iii Analysis

Analysis starts with systems request that describes the problems or desired changes in the system. It identifies the nature and scope of the business opportunity and problem by performing a feasibility study

iv Design

The Design phase creates a blueprint for the new system that will satisfy alldocumented requirements. It identifies all necessary outputs, inputs, interfaces and processes. Designs internal and external controls that will ensure:

- Reliability
- Security
- Maintainability
- Accuracy

The design is documented in the systems design specification and presented to the management and users for their review and approval. The involvement of Management and users is to avoid any misunderstanding about what the system willdo, how it will do it and how much it will cost.

Implementation

In the implementation phase, the new system is constructed by the programeers and designers and finally given to the final user.After implementation data is converted into system files,users are trained, and the actual transition to the new system is undertaken.

A Systems Evaluation is later done to determine If the systems operates properly andif the cost of the system and benefits are within expectations

Post implementation and maintenance

During this phase the IT department and staff maintains (corrects the errors and adapt to changes in the environment) and enhances the system. Enhancements provide a maximized return on IT investments

5. CONCLUSION

I believe I have done enough research on the Project and am ready to start and complete the project over the period specified and also make the Output.

With the help of this project,

- Person able to buy the damaged on their own.
- With this , we can know the accurate percentage of damages.
- It can be used both in remote , urban areas etc.
- Used to predict the damaged part of the vehicle.
- It can also predict the estimate amount to replace the product damaged.
- Mainly built for Insurance Company.
- It can also built as an application with the real time images.

Thank you in advance for your consideration.

FUTURE ENHANCEMENT

- Used to predict the damaged part of the vehicle.
- In Future, it will be constructed as as application where the real images are used to detect the damage parts.
- It will be useful in different areas like,

INSURANCE COMPANY,CARS CENTRE,WORKSHOPS etc…

REFERENCES

ResearchGate

Social network

ResearchGate is a European commercial social networking site for scientists and researchers to share papers, ask and answer questions, and find collaborators. Wikipedia

- **https://www.researchgate.net/publication/348917359_Car_Damage_Assessment_Based_on_VGG_Models**

Source:1

ijarsct.co.in was first indexed by Google in May 2020

- **https://ijarsct.co.in/Paper5048.pdf**

Source:2

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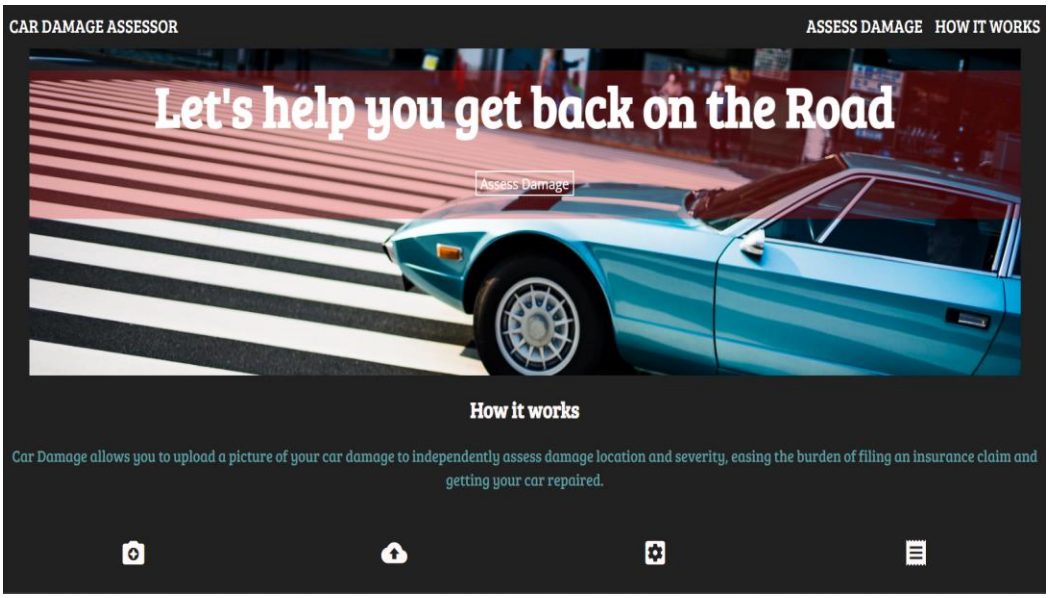
https://www.instituteforapprenticeships.org/apprenticeship- standards/vehicle-damage-assessor

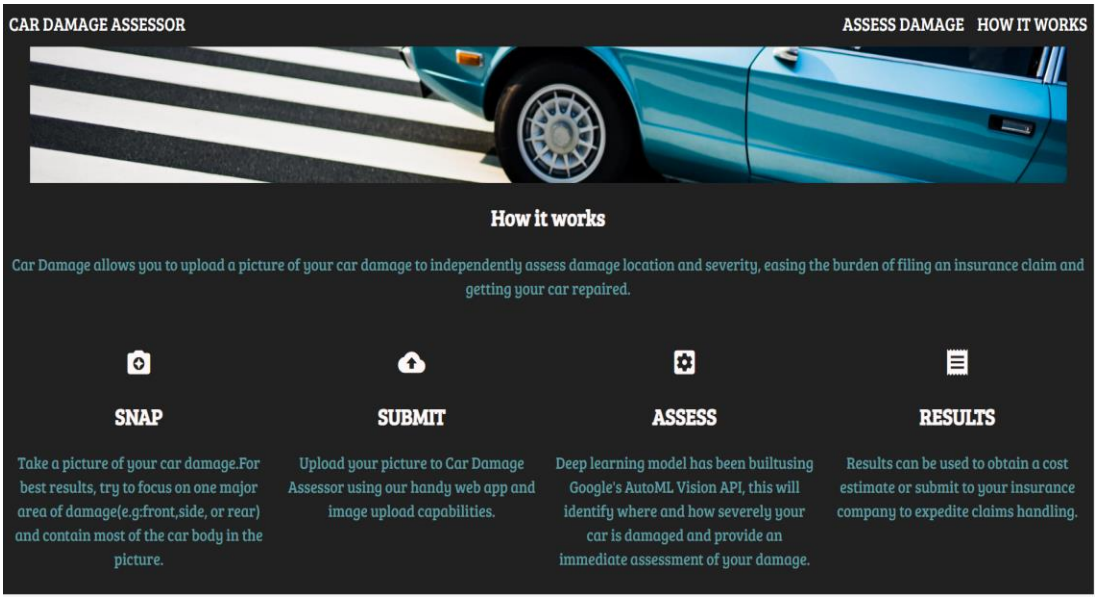
FROM DESIGN :

PROJECT FRONTEND SCREENSHOT

SCREENSHOT-1

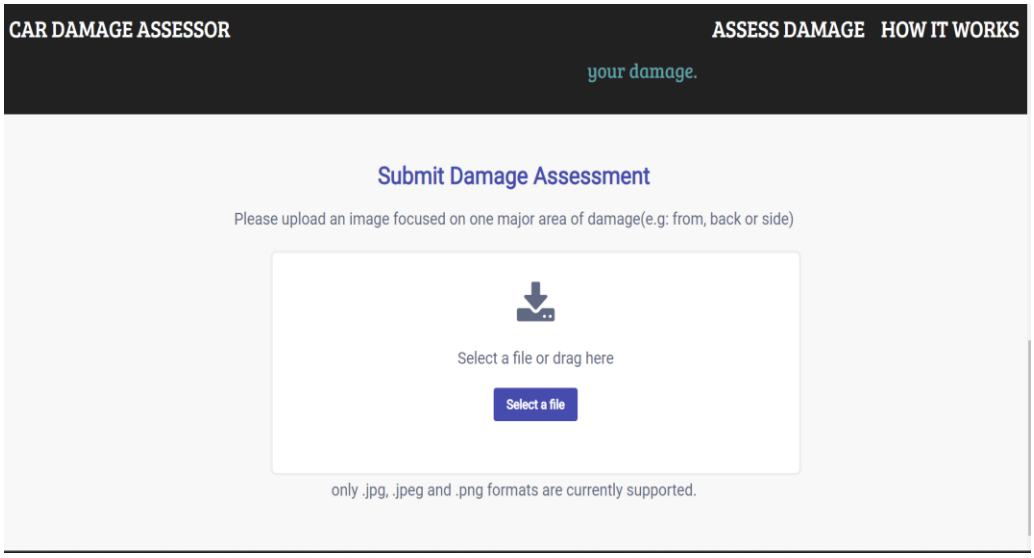


SCREENSHOT-2

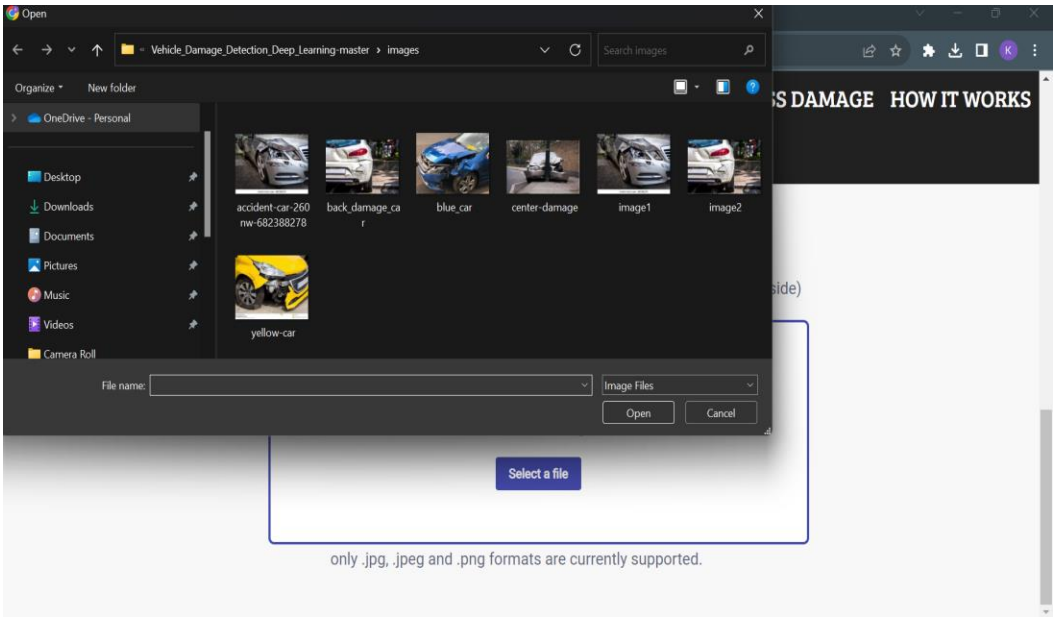


OUTPUT SCREENSHOT

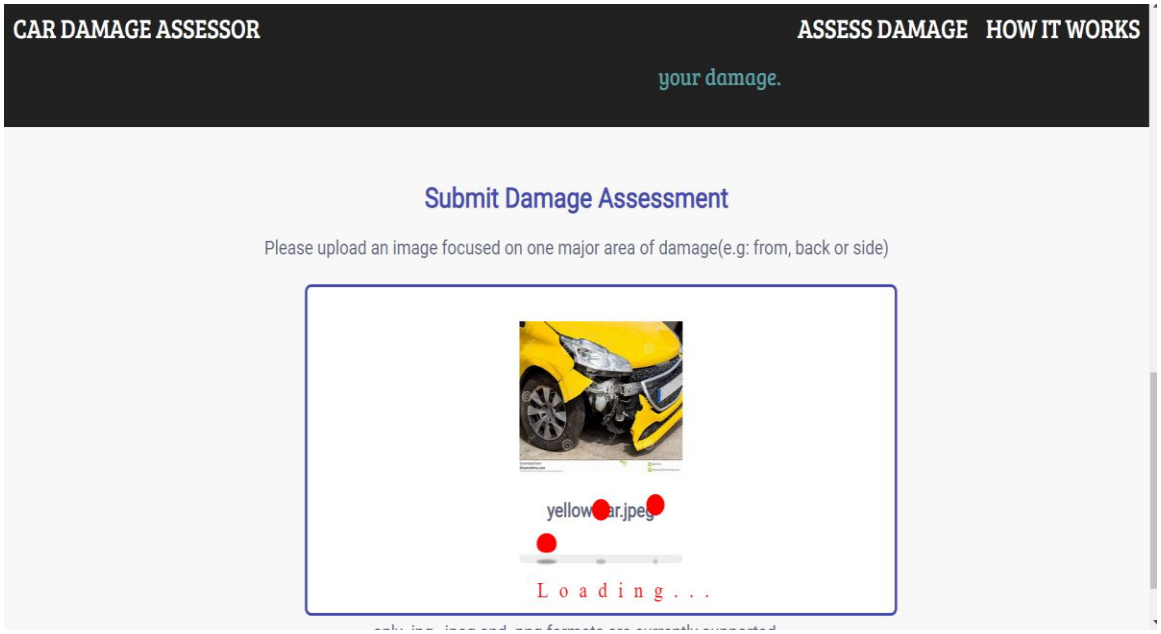
SCREENSHOT-1



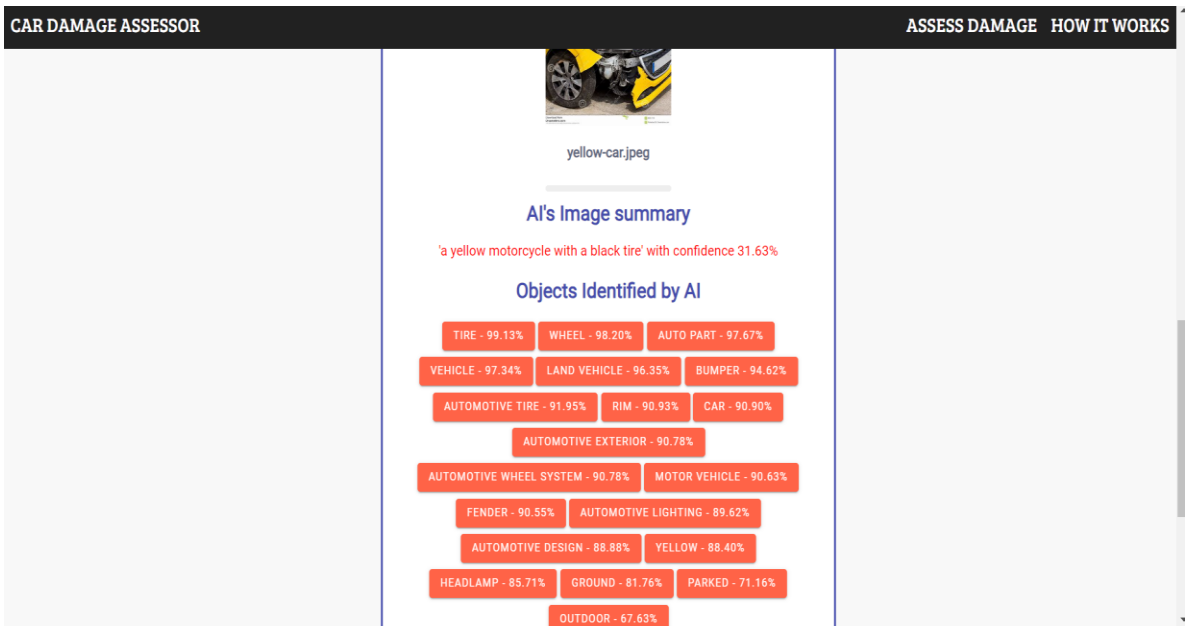
SCREENSHOT-2



SCREENSHOT-3



SCREENSHOT-4



SCREENSHOT-5