TECHAUTO: EMBRACING ARTIFICIAL INTELLIGENCE IN WEB BASED AUTOMOBILE SERVICE MANAGEMENT SYSTEM

CHAPTER 1
INTRODUCTION

1.1 GENERAL INTRODUCTION

As the global automotive industry is progressing towards the future of mobility, Garage Chains are due for a major overhauling. With the advent of digitisation, customer expectations have shot up and now they demand a seamless experience even in the aftersales automotive ecosystem. The Online Management System for Automobile Services is a progressive step in the field of service centers and garages. Any car user can make use of this website to locate and communicate with the service centers or garages in their vicinity. This website uses innovative technology that connects you with a Mechanic at the tap of a button.

Our system offers a host of ground breaking innovations in garage management software and garage management systems that are instrumental in redefining the entire digital journey of the customer when it comes to the maintenance and garage chains landscape.

1.2 GOAL OF THE PROJECT

TechAuto:embracing Artificial Intelligence in web-based Automobile Service Management system is an online management system for Automobile services ,a progressive step in the field of service centers and garages.Any car user can make use of this website to locate and communicate with the service centers or garages in their vicinity.

CHAPTER 2
LITERATURE SURVEY

2.1 STUDY OF SIMILAR WORK

Fully automated Garage Management System(GMS) is a cloud-based mobile and responsive web application for garage management with CMS. You can manage your whole garage system through this system and manage your website also. This is the best software for managing your garage job work, estimate, invoice, income, expenses, inventory sell and buys parts and customer interactions.

Quick Job Card

A record card is related to a specific job. It gives details of the time taken to do a piece of work and the parts used in the process

Easy Estimate

Share estimate to potential customers they may need to know the services and parts to be used

Book Service Appointment

Book and manage appointments using this app is Free and get reminders at a specific time

E-Invoicing

As business advance into the digital era, more and more are switching to electronic invoicing services to automate their accounts payable

Garage Expenses

An expense is the cost of operations that a company incurs to generate revenue. This app provides feasibility to manage your expense for Free.

Service Reminder

Easily know which vehicles are due or overdue for service. Easily send reminders to your customers via SMS.

2.1 EXISTING SYSTEM

The Garage Management System till now was not able to record the service details of vehicles. It was done manually. The inventory of spares is done manually. There was no maintenance history of all the vehicles that were serviced in the garage. The service dates had to be tracked manually and that was a difficult task.

Nowadays, having a car has become a common aspect of Indians; thus, sales have increased. It needs regular services and maintenance with an appropriately trained mechanic as it's an automobile or vehicle. And today, we all are on a busy schedule, and time to visit the service station has become a significant problem. This application of automobiles, i.e., vehicle services request, is one of the unique concepts. Here customers send a request for his car maintenance and pick up. The business owner sends his field engineer to pick up the car and note down all the customers' vehicle issues. Thus, details of the problem he faces are registered, and its budget is given to him. The well-trained staff does at his location, and an expert automobile engineer does its test drive. Extra associates can be provided, a garage mechanic. He gives regular reminders of the maintenance to a garage owner or works hope owner at regular intervals.

2.1.2 DRAWBACKS OF EXISTING SYSTEM

- Personal should be available for all seasons regardless of the customer flow.
- Efficiency and productivity of the workers cannot be scientifically tested.
- Availability of spare parts is uncertain.

CHAPTER 3
OVERALL DESCRIPTION

3.1 PROPOSED SYSTEM

Proposed system is TechAuto.It is an Online Management System for Automobile Services is a progressive step in the field of service centers and garages. Any car user can make use of this website to locate and communicate with the service centers or garages in their vicinity.

● Enhance customer relations

● Simplify stock control

● Improve mechanic efficiencies

● Monitor performances

The system includes

❖ Garage Management Solutions :help garage chains to utilize their services for high efficiency with a larger objective of providing a delightful customer experience. It facilitates almost everything right from extensive searches, appointment booking, parts ordering to even report generation.

❖ Time Registration is a kiosk-based application used for optimizing operational efficiency by tracking mechanic's workload. It manages work hours spent on each task that is allocated centrally in the garages.

❖ Online Workshop Planner (OLP) is an extensively integrated centralized platform for managing all the garages bookings and other services It synchronizes with garage planners for better management.

❖ A mobile and tablet application that helps mechanics to access information at their workplace and execute work orders. It provides information related to maintenance and repairs to the mechanics and facilitates them to set their availability, schedule repairs, track or order spare parts.

❖ Emergency App A one of a kind mobile app specifically created for roadside assistance, automatic emergency alerts and response. It instantly sets emergency management plans, location reporting & personalized message directed to emergency response centres.

❖ Mechanic training platform A training platform to enable technical, sales and management training for garage personnel

Application Of AI in Tech Auto

- Categorization and prediction of demand of spare parts

A modern automobile is composed of around about 30,000 parts . Components that bust over time, need to be replaced during the maintenance process. Therefore, spare parts are needed at the right place, in the right quality and quantity, for replacement of broken parts to keep the automobile working.

- Manage and find efficiency of workers: Using artificial intelligence to transform employee productivity.
- Auto service reminders based on user statistics, Customer segmentation and Auto Marketing campaign

3.2 FEATURES OF PROPOSED SYSTEM

● Auto service reminders

● Auto marketing campaigns

● Employee productivity assessment

● Spare part demand prediction

● Auto status information alerts

● Auto purchase order generation

● Employee work scheduling

● Sales prediction

● Forecast Workload

● Auto service registration

● Emergency one click assistance

● Monitor quality of work

● Auto Feedback system

● Employee rating system

3.3 FUNCTIONS OF PROPOSED SYSTEM

- Categorization and prediction of demand of spare parts

  A modern automobile is composed of around about 30,000 parts. Components that burst over time need to be replaced during the maintenance process there for spare parts are need at the right place, in the right quality and quantity. For replacement of broken parts to keep the automobile working.
- Manage and find efficiency of workers: Using artificial intelligence to transform employee productivity

  Using artificial intelligence,sytem is able to learn and manage efficiency of workers as well as increase their productivity.able to predict the required personnel according to each season.
- Auto service reminders based on user statistics,Customer segmentation and Auto Marketing campaign.
- Customers will map to different groups using machine learning models based on the customer behaviour.

3.4 REQUIREMENTS SPECIFICATION

System analyst tasks to a variety of persons to gather details about the business process and their opinions of why things happen as they do and their ideas for changing the process. These can be done through questionnaires, details investigation, observation, collection of samples etc. As the details are collected, the analyst study the requirements data to identify the features the new system should have, including both the information the system produce and operational features such as processing controls, response times, and input output methods .Requirement specification simply means, “Figuring out what to make before you make it”. It determines what people need before you start developing a product for them. Requirement definition is the activity of translating the information gathered in to a document that defines a set of requirements. These should accurately reflect what consumer wants. It is an abstract description of the services that the system should provide and the constraints under the system must operate. This document must be written for that the end user and the stake holder can understand it.
The notations used for requirements definition should be based on natural languages, forms and simple intuitive diagrams. The requirements fall into two categories: functional requirements and non-functional requirements.

The requirements of specification of the proposed system are as follows:

- Minimum time needed for various processing
- Better service
- Faster response time

3.5 FEASIBILITY ANALYSIS

An initial investigation culminates in a proposal that determine whether an ultimate system is feasible. When a proposed system is made and approved it initiates a feasibility study. The purpose of the feasibility study is to identify various candidate systems and evaluates whether they are feasible by considering technical, economical and operational feasibility and to recommend to best candidate system. The feasibility of such a program is listed in a simulated environment. Once all features are working property in a simulated environment, we can implement in a real platform. During product engineering, we consider following types of feasibility:

3.5.1 Technical feasibility

Technical feasibility identifies whether the proposed system can be developed with the existing technologies and available hardware and software resources. As part of the technical feasibility of the system , the following points are to be emphasized.Technical feasibility is frequently the most difficult area to assess at the stage of the product engineering process. It is essential that the process of analysis and definition be conducted in parallel with an assessment of technical feasibility. The considerations that are normally associated with technical feasibility are development risk, resource availability and technology.

3.5.2 Operational feasibility

Proposed projects are beneficial only if they can be turned into information systems that will meet the operating requirements of the organization. This test of feasibility asks if the system will work when it is developed and installed. This project satisfies all the operational conditions. The project is found to work well on installation , all types of users can operate the system without any difficulty. User interfaces are designed in such a way that even ordinary users without having much knowledge in computer technology can easily operate the system . The access time of data is considerably low and the operation is less time consuming .

3.5.3 Economical Feasibility

An evaluation of development cost weighted against the ultimate income or the benefit derived from the developed system or product. Economic feasibility of a system means that the cost incurred in developing and implementing a system should not be higher than the financial benefits obtained by the users. During the economic feasibility study the following points were investigated.

- The cost to conduct a full system investigation
- The cost of hardware and software for the application being developed.
- The benefits derived by the users in terms of time , effort, accuracy of information, ,better decision making. Etc. are quantified and compared.

3.5.4 Behavioral Feasibility

Behavioral Feasibility evaluates and estimates the user attitude or behavior towards the development of new system.It helps in determining if the system requires special effort to educate, retrain, transfer, and changes in employee's job status on new ways of conducting business.

CHAPTER 4
OPERATIONAL ENVIRONMENT

4.1 HARDWARE REQUIREMENTS

Processor	:	Intel i5 6th Gen
RAM	:	8GB ddr4
Hard Disk	:	256 GB SSD
Drives	:	CD ROM , C-type Port , USB 3.1*2 Port
Display Size	:	15” LED Monitor
Screen Resolution	:	1920*1080 Pixels
Keyboard	:	Wireless Enabled Logitech Keyboard
Mouse	:	Wireless Enabled Logitech Mouse
Monitor	:	Touch Capacity LED Monito
Dedicated Graphics Card	:	Nvidia Geforce 920m 2GB DDR4

4.2 SOFTWARE REQUIREMENTS

OPERATING SYSTEM :	WINDOWS 10
PROGRAMMING LANGUAGE	: PYTHON
IDE	: PYCHARM
SCRIPTING LANGUAGES	: HTML,CSS,JAVASCRIP
WEB BROWSER	: GOOGLE CHROME
FRONT END	: PYTHON,DJANGO
BACK END	: POSTGRESL
FRAMEWORK/LIBRARY	: DJANGO,SCIKIT-LEARN,TENSORFLOW

4.3 TOOLS AND REQUIREMENTS

4.3.1 PYTHON

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse. The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed.

Often, programmers fall in love with Python because of the increased productivity it provides. Since there is no compilation step, the edit-test-debug cycle is incredibly fast. Debugging Python programs is easy: a bug or bad input will never cause a segmentation fault. Instead, when the interpreter discovers an error, it raises an exception. When the program doesn't catch the exception, the interpreter prints a stack trace. A source level debugger allows inspection of local and global variables, evaluation of arbitrary expressions, setting breakpoints, stepping through the code a line at a time, and so on. The debugger is written in Python itself, testifying to Python's introspective power. On the other hand, often the quickest way to debug a program is to add a few print statements to the source: the fast edit-test-debug cycle makes this simple approach very effective.

4.3.2 Django

Django is a high-level Python Web framework that encourages rapid development and clean, pragmatic design. Built by experienced developers, it takes care of much of the hassle of Web development, so you can focus on writing your app without needing to reinvent the wheel. It’s free and open source.

Ridiculously fast.

Django was designed to help developers take applications from concept to completion as quickly as possible.

Reassuringly secure.

Django takes security seriously and helps developers avoid many common security mistakes.

Exceedingly scalable

4.3.3 Postgresql

PostgreSQL is a powerful, open source object-relational database system with over 30 years of active development that has earned it a strong reputation for reliability, feature robustness, and performance.

A robust database in the LAPP stack

LAPP stands for **L**inux, **A**pache, **P**ostgreSQL, and **P**HP (or Python and Perl). PostgreSQL is primarily used as a robust back-end database that powers many dynamic websites and web applications.

General purpose transaction database

Large corporations and startups alike use PostgreSQL as primary databases to support their applications and products.

Geospatial database

PostgreSQL with the PostGIS extension supports geospatial databases for geographic information systems (GIS).

4.3.4 Pycharm

Pycharm is an integrated development environment (IDE) used in computer programming.specifically for the python language.it is developed by the Czech company jetBrains.it provides code analysis ,a graphical debugger an integrated unit tester etc.

4.3.5 Tensor Flow

TensorFlow is an end-to-end open source platform for machine learning. It has a comprehensive, flexible ecosystem of tools, libraries and community resources that lets researchers push the state-of-the-art in ML and developers easily build and deploy ML powered applications.

Easy model building

Build and train ML models easily using intuitive high level API's like Keras with eager execution ,which makes for immediate modeliteration and easy debugging.

Robust ML production anywhere

Easily train and deploy models in the cloud,on-prem,in the browser,or on-device no matter what language you use.

Powerful experimentation for research

A simple and flexible architecture to take new ideas from concept to code,to state-of-the-art models,and to publication faster.