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Project Idea: AI/ML Car Problem Diagnostic App

The project will be a smartphone application that diagnoses mechanical issues in automotive vehicles. The app will use an AI/ML database created by its users, allowing the app to get better and smarter through users' questions and solutions. Beginning with simple text-based questions and answers, to possible audio detection software to diagnose problems from sounds coming from the car. The AI/ML program will provide more detailed and varied solutions as more questions are asked by users and will feature a maintenance schedule based on the use of your car and the app.

With most apps of this description requiring third-party, expensive equipment to read error codes coming from the car, this app will be first of its kind putting power back in the driver's hands, saving money, time and effort for problems that can be often fixed at home. With 92.5%¹ of households owning a car, and average servicing and tyre costs of a two-car household ranging from \$1,448.72/year in regional areas to \$1,529.32/year in major cities², there is a lot of money to be saved through reducing visits to the mechanic. By implementing AI/ML technology, the app will provide increased solutions as time goes on and allows for infinitely more growth than apps relying on third-party technology. The solution is relatively cheap if you know what you're doing but it is recommended to be outsourced and collaborative to ensure a well-rounded, consumer-centric product.

¹ <https://www.finder.com.au/car-statistics>

² <https://www.budgetdirect.com.au/car-insurance/research/car-owner-cost-statistics.html>

The app will begin with a screen asking several questions, such as, “can you hear it?”, “can you smell it?”, “can you feel it?” etc. to get a general idea of where the problem may arise, followed by increasingly specific questions to pinpoint the problem. The use of AI/ML program is what will really set this project apart though, as more users find both correct and incorrect solutions the program filters out arbitrary questions and places more emphasis on previously helpful questions allowing for faster more concise answers. Through use of these technologies, common problems and solutions will be shown based on the make and model of your car. As the app is more widely used and the AI’s database becomes well-established more features such as audio and picture detection may be implemented. With audio detection taking samples from the cars’ starting, running and driving noises in order to analyze irregular patterns and compare sounds from healthy engines, as well as possible picture detection, recognizing irregularities in users’ pictures in comparison to healthy vehicles. This all requires a database of sounds and pictures that will be uploaded by users in the “text-only” stage of the app, allowing for a seamless transition into a rounded, audio, visual and text based diagnostic app. Once all features are running a “health tracker” feature will be added, where, with the users consent, the app will regularly sample engine sounds and ask for pictures to be taken to monitor the health of the vehicle. As irregular sounds or differences in pictures are detected the driver will be alerted and given the most appropriate solution, as well as track the degradation of the vehicle.. Looking past the app this project can easily be transferred to multiple platforms such as a website or social media page to increase awareness and overall accessibility. Doing so will allow for those who may not generally use many apps to discover the product.

Software needed for this project varies from person to person, mostly based on preference, however third-party AI and ML platforms such as Amazon Machine Learning may be useful to simplify the process. As the hardware needed is quite minimal, only

consisting of mostly just computers and phones to write and implement the code, the most complex and time-consuming aspect of this project is the AI/ML. Creating an AI/ML program specifically based around automotive problems and diagnosis would take both a team of software engineers and data scientists, writing both the AI and the app, and a team of mechanical engineers and brand professionals to ensure the program not only works, but provides accurate, safe and tailored information to the user. Although it will be a sizeable task to find such a broad skillset to undertake this project, I know it is possible with the right thinking.

If the project is successful, the way we go about maintenance and repair will be forever changed, saving countless of individuals hundreds, if not thousands of dollars annually. The original problem of lack of basic understanding of cars and how they work will ultimately be avoided through accessibility alone, with every answer they need at their fingertips. I believe with the right development and implementation this project could truly revolutionize peoples understanding of cars and the car industry in general.

