

## Project Plan

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We propose a project that consists of a small device that helps with the location of tools in a garage setting. So often when working on a mechanical project, the space is in a small, dark, and dirty garage or shed. This makes organization very hard, especially when the person in charge of organization is distracted working on a vehicle. This means tools get misplaced and then eventually searched for. Time is often wasted looking for these tools which is frustrating and tiring. I believe that using a small simple wrist application this problem can be solved. The application would be small and have either a small display with a directional pad or just have numbered buttons. Each number would be tied to a tool. When a button is hit the tool makes an audio signal so it can be easily found. The audio signal is generated by a small speaker magnet attached to the tool. The speaker has a radio antenna that picks up a specific signal generated by the wrist application. Each speaker antenna has its own frequency so only one is set off at a time. When recieved it makes a beeping sound or ringtone. Dozens of these can be bought so all tools can be marked. When the tools are lost simply consult the number chart (which catalogues tool numbers) and press the corresponding digits. The radio wave will be designed to work at a range of about 500 ft and will be able to penetrate thin metal, sheetrock, and insulation. This should allow a minimization of connection failures. This application would be a major seller for amateur mechanics and for others who need a tracking app of such use. The small speaker antennas would be cheap to make and could be sold in packs of dozens. Possibly could be implemented as a phone app that sends signals via bluetooth to a base station that then performs the same task as the would be wristband. Implementation would not be impossible and a prototype could probably be designed with parts from local businesses.

We will meet on Wednesdays from 10:00 AM to 10:30 AM to discuss the progress of the project and to delegate the responsibilities of what to do next. We will use email and texts to keep each other up to date. All other services at the moment are overkill since there are only two of us. All of our documentation will be stored on a Google Drive.

Data collection will be implemented in two ways; the first of which consisting of a few one on one interviews. The interviewees will consist of at least two amateur mechanics and one person who is not a mechanic. The interviews with the mechanics will help describe their typical work habits and environment in order to best to design the app for that user base. For example, we can figure out whether visual or audio alerts will be more attention grabbing, based on what a typical garage looks like. If we find that tools are often left in tool boxes or drawers then the audio signal played will have to be of a higher frequency to penetrate through the enclosing material. If the mechanics have more trouble finding tools they just had in their hands, then the tool is probably under another tool, shop manual, or somewhere within the vehicle being worked on. In that circumstance, the visual aspect will probably be more helpful in efficient location of the tool. To get this information the interview will primarily consist of broad questions that ask the mechanic to describe his or her work environment, as well as a couple questions asking what the mechanic most struggles with in the garage. This could lead to stretch implementations that make the application more well-rounded if time permits. The non-mechanic will be given a different type of interview. He or she will be asked about short term memory performance, the usefulness of being able to locate any often used item (like phones, keys, wallets, etc.), and how he or she would feel about using such a device to find his or her items. This interview will give us a general idea of the possible user base for such a product. With this information we should be able to decide what features to add and how to design the user interface to appeal to our users.

The second method of data collecting we will be implementing is contextual inquiry. This will allow us to observe the interviewee and inquire about how they specifically work in their own space. Contextual inquiry requires us to observe the interviewee actually working, so the people we will chose to conduct this method of data collecting will probably be at least two amature mechanics. Observing the mechanics working in their personalized workspace will allow us to gain an insight into how they work and what we will need to implement into our app and audio/visual design to achieve maximum efficiency in different environments. For example one mechanic might be working in a very organized, bright and clean garage while someone else might be working under a lamp in an untidy shed. These scenarios are just two of the many possibilities we can encounter while conducting contextual inquiry but that will help us understand what needs to be implemented in our design. In order to conduct a successful session we must first start with a traditional interview before we start anything else. These interview questions will be about the mechanic's work and also used to establish a trusting relationship which will be useful later. The next step will be to imitate a role playing simulation where the mechanic is the master and the interviewers are the apprentice. This will allow us to gain the most insight because they will be teaching us how they work and what is important for the job. They will explain and teach the essential parts of how they work as a mechanic which gives us an insight into what it is like being a mechanic. After being an apprentice for about thirty minutes, the next step is general observation of the mechanic working. This is where we takes notes of how they work and where they place tools when exchanging. While we are observing we should remain in the background and only interrupt their work if we have an important question about what they are doing. Once we finish all of those steps, we can summarize the most essential points and use them to make our application as efficient as possible.

