**NEA Analysis**

**Background to/ Identification of problem**

**Background:**

Shaun is an Auto Electrician who works for InCarTec. His work consists of anything electrical within vehicles from the stereo system to the inner ECU of the vehicle.

**Identification of Problem:**

Currently Shaun is using outdated software when fault testing and CAN Reading, and this is due to the price of the programs available. He is looking for software that is simple to understand and use while also providing him with a plethora of data that is needed to diagnose the vehicles. With cars now mostly having electronic controls everywhere, the older software is becoming harder to read effectively with the amount of data coming in. These older programs lack the ability to save profiles of different vehicles (making it quick and easy to diagnose cars of make and model that have already been worked on), filtering and focusing on specific Ids, save a log of all data coming in, and much more.

Many problems also come from the interfaces within the programs, the people operating the software aren’t always going to be the best with technology, and just want a simple to operate system that can clearly display the data that they want to see. The software should be straightforward and simple for the user rather than assuming they understand everything being presented.

**Description of the current system**

There are a few programs available to use but usually come with a hefty price. Most of these are heavily optimised and come with many functions, but to users like Shaun and many other people in smaller businesses, these are overkill and actually usually quite impractical, confusing users with data useless to them, or to many different options, making the software irritating to use.

There are other cheaper options or even free DIY options available to people, but these can also be a bit confusing to operate just due to unoptimized interfaces and functions. These also may not include harder to implement functions that may be required for common jobs, making them obsolete in industrial use.

**Research into CAN Reading and Fault Diagnosing**

**CAN Bus**

The Controller Area Network (CAN bus) is a message based protocol that is designed to allow the Electronic Control Units (ECUs) to communicate with each other without the need of a host computer. Data is sent serially to all devices within the system, but has a priority system in place that insures if two “frames” of data are sent at the same time, the one of highest priority is sent first.

The CAN bus is used in pretty much every vehicle in todays industry due to the many benefits it provides. CAN systems are very sturdy and robust against interferences such as electric and electromagnetic disturbances, aswell as being fully centralized, meaning all data is sent through one point of entry, making reading and debugging possible from a single wire, this also means that less wiring is needed, also making the costs of production reduced. The transmission of data is also very efficient as the “frames” of data are prioritized, meaning higher priority data gets to where it needs to quickly without causing any problems within the system.

Each device is called a “Node” and they all each contain their own Central Processing Unit (CPU), CAN Controller and transceiver. Data is sent onto the network, where any node which has been addressed can access it rather than it being directly sent to each node, and each node can both send and receive data, but not simultaneously.