# Software Requirements Specification (SRS)



## Telemetry Dashboard System

## Software Requirements Specification Document

*Members:*

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**Version: 1.0** **Date: 18/ Apr/2022**

# General Index

# 1. Introduction

*This document will clarify and analyze the requirements for the "Telemetry Dashboard Software" project. The IEEE Software Requirements Handbook (Std. 830-1993) is utilized because of this.*

## 1.1 Purpose

*This document's main goal is to provide an overview of the TDS (Telemetry Dashboard System) project to the development team, "Digital Multimedia" corporation, and end users.*

## 1.2 System scope.

- *System Name: TDS, "Telemetry Dashboard Software"*
- *It will be carried out using a SCRUM-based methodology.*
  *(This technique may be used because it encourages flexibility and ongoing input, which makes it useful in settings where software development processes are dynamic and ever-changing.)*
- *The system will control the procedures for telemetry and automotive issue detection; it will also save records in a database for later study and show sensor data in real time.*
- *The main beneficiaries of the TDS are the users who implement it. The objective is to detect faults in the car. The goal of TDS is to establish itself as a useful tool that works by detecting possible faults and defects in the car.*
- *It will ultimately be used in racing cars, but it will first be installed in regular. everyday automobiles.*

## 1.3 Definitions, acronyms and abbreviations

- *(TDS) – Telemetry Dashboard System*
- *DB – Data Base*
- *UML– Unified Model Language*
- *IEEE – Institute of Electrical and Electronics Engineers*

## 1.4 References

*W3C protocols*

*http://www.w3.org/standards/webarch/protocols*

*Web Architecture Fundamentals*
*http://www.w3.org/standards/webarch/principles*

*"Requirements Engineering Process" Part of the complementary material of the Planning and Modeling subject. Available online at:*
*http://antares.itmorelia.edu.mx/~jcolivar/courses/pm10a/index.html*

## 1.5 Document Overview

*The document is divided into 4 sections:*

- *The explanation, aims, and a thorough synopsis of the document's content are covered in the first part.*
- *The second portion gives a basic overview of the system and is primarily targeted at prospective customers or users, offering easily accessible and comprehensible information.*
- *Particular needs for the system are covered in the third section. To accurately describe the characteristics and operations of the system, technical phrases intended primarily for developers and programmers are used here.*
- *The remaining appendices, which include explanatory illustrations in a variety of formats that describe and illustrate how the system operates, are included in the fourth part.*

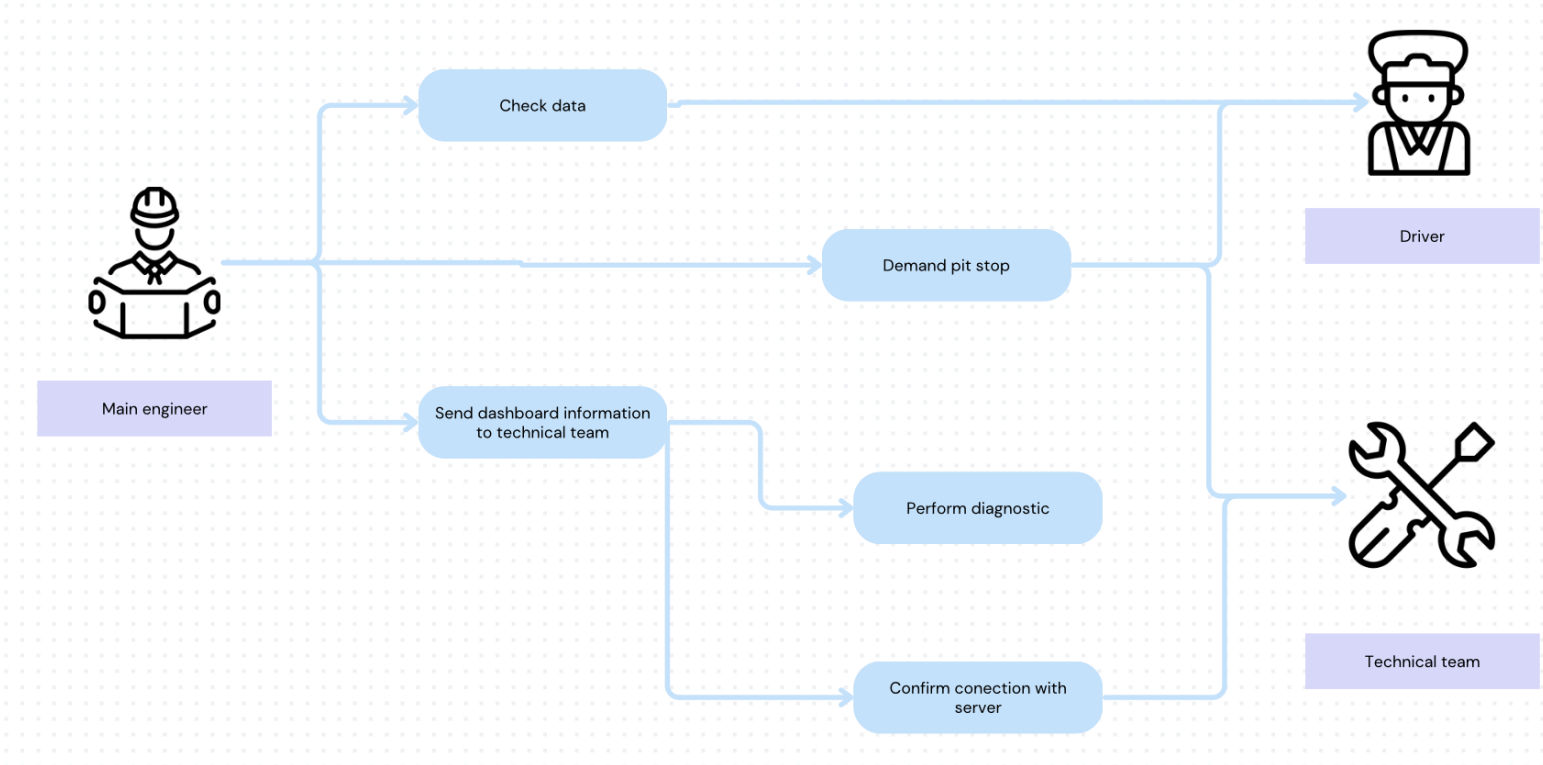
# 2. General Description

*Both the product and its demands are influenced by a wide range of circumstances. These elements are acknowledged as the setting in which the system is created in this section. These variables include costs, development timelines for each step, and consumer accessibility.*

## 2.1 Product Perspective

*The finished system makes it possible to handle descriptive data about cars, such as performance statistics, technical diagnosis, and the monitoring of possible car issues. It also provides the capacity to handle and evaluate telemetric data in order to efficiently identify and resolve potential problems in automobiles. The goal is to use C language to develop programming.*

*Use case diagram for Telemetry Dashboard*



## 2.2 Product Features

- *Vehicle descriptive information.*
- *Technical diagnostics.*
- *Provide vehicle details.*
- *Monitor possible issues.*
- *Control data telemetry.*

## 2.3 User Characteristics

*The system has three types of end user:*

- *The first group consists of the pilots, who are responsible for operating the vehicle and are the ones who utilize the telemetry software first.*

- *The technical team comprises the majority of the second group. They oversee capturing pertinent data and working on the information in real time, enabling them to know the outgoing information that the vehicle captures.*

- *The fans, or those who just want to view the data that the technical team wants to display, make up the third group. In this instance, the technical team will be responsible for projecting the data on televisions, the internet, etc., and they will also have worked on the data that you want to reveal beforehand (Only if desired)*

## 2.4 Restrictions

*There are several factors that must be considered when creating and implementing a telemetry dashboard, such as:*

- ***Bandwidth and Connectivity**: This section emphasizes the need for a dependable network connection, the locations where bandwidth is limited, and the sporadic nature of connectivity in remote areas.*

- ***Device Compatibility**: It is important to ensure compatibility and efficient integration into the system due to the variety of devices and communication protocols.*

- ***Regulatory Requirements**: Careful attention must be paid to ensure compliance with certain data privacy and security standards.*

## 2.5 Assumptions and Dependencies

*The system must have the characteristics of a car so that the dashboard and sensors may be applied for it to work properly.*

## 2.6 Exclusions

***Functionality Exclusions:***

- *Features beyond data collection, projection, and display, or those unrelated to telemetry, will not be included.*

***Platform Exclusions****:*

- *Operating systems or platforms beyond the purview of the project will not be supported by the design of the system.*

***User Interface Exclusions:***

- *Beyond what is strictly required to examine telemetry data, no specialized user interfaces or additional features will be built; in other words, the user will be in charge of altering the data, although we will present a hud with the option to do so.*

***Hardware Exclusions:***

- *The project will not involve designing or developing hardware for sensors, gadgets, or other tangible parts. These are taken for granted to be operational and accessible.*

***Scalability Exclusions****:*

- *We will not be using scalability measures to guarantee continuous availability in this project.*

***Regulatory Compliance Exclusions:***

- *Compliance with particular laws, such those pertaining to data privacy, will not be part of the project's scope and will fall under the client's purview.*

***Maintenance Exclusions:***

- *The project will not cover long-term maintenance procedures; nevertheless, it may be noted that the customer or a post-implementation maintenance team will oversee them.*

# 3. Specific requirements

## 3.1 Interface

*The graphical user interface (GUI) for the end user must be simple enough for the user to quickly recognize the various sections and components of the system, even in the absence of a user manual. It must also have aesthetically pleasing colors so that the user may work with it for hours at a time without encountering any problems. In a similar vein, the objective is to present the facts through an easy-to-use interface without needing the user to go further. via the dash.*

*Welcome message.*

- *A brief welcome message that may be muted will appear when the system first boots up. As soon as the car is started, all dashboard features become active.*

- *The message window's size will change based on the largest display that the car can accommodate.*

- *All data will be applied as requested and in accordance with the vehicle specifications; modifications may be made based on the needs and capabilities of the vehicle.*

*Menu*

- *The menu will be an entirely optional feature that appears on the left side of the main screen. It will enable you to alter the layout of the user interface, update data that is uploaded to the database, and provide or restrict access to historical data provided by the car.*

- *This menu has as many items as are required for the particular kind of user. With the exception of racing cars, the technical team will have more options on the menu than the driver. The driver menu will contain:*
  - *Home*
  - *Consult data in real time.*
  - *Modify dashboard.*
  - *Activate/Deactivate Warnings for cases saved in the database.*
  - *Data that is allowed to be sent.*

  - *Basic data from a dashboard (fuel level, lights on/off, mileage, engine temperature, speed, acceleration, air conditioning).*
  - *Link with the technical team.*

*(The options may vary depending on the user, not all vehicles may display it in the same way)*

*The menu for technical team will contain:*

- *Home*
- *Consult data in real time.*
- *Real-time data projection*
- *Suggestions menu based on data.*
- *View of vehicle data changes over time*
- *Link with the vehicle*
- *Modification of projected dashboard*
- *Report generator*
- *Access to the vehicle database*
- *Vehicle system update*

*Vehicle Connection System*

- *The user must enter a username and password created by the vehicle. The generated password will have at least 8 characters and will be sensitive to the use of upper- and lower-case letters.*

- *The username must be formed by the technical team and will not be necessary for the operation of the vehicle.*

- *On the tenth failed login attempt, the system will automatically lock that user for a certain time (15 minutes).*

  *(This case is only required for racing vehicles, they can also be applied in all cases, but it would be an inefficient functionality for private use)*

*Header*

- *The header of the home page will be a representative image (logo, animated) of the company (open to customization).*

## 3.2 USER STORIES

*When the pilot engages the engine, the car's sensors are checked, and a notice indicating the vehicle's state is generated. The technical team responsible for keeping an eye on the data the car provides is supplied this information.*

*The sensors are updated in real time throughout the race and provide the car's diagnostic on a regular basis. This allows the car to analyze situations in which its indicators are changed, detect potential breakdowns, and keep the driver safe. car.*

*In the event of a malfunction, the system will identify whether the issue is just unimportant or one that might result in an accident. The driver will be alerted in the case of a deadly malfunction so he may stop the automobile safely and continue with vehicle maintenance.*

## 3.3 Non-Functional Requirements

*The primary prerequisite that must be met is the storage of the sensor data in a database. This will enhance dashboard users' security and enable them to access all alarm histories and supporting documentation in the event of an emergency. Furthermore, a username and password must be setup for the user to access the data whenever they like.*

*Due to the software product's reliance on sensors that provide real-time data to the dashboard, regular system maintenance is necessary. Failing to do this maintenance might result in an accident that could have been completely avoided. In order to ensure user safety, maintenance must be performed by experts. The date of this review will coincide with the vehicle's servicing.*

*The customer demands that the system work and ensure the user's safety while always operating the car.*

## 3.4 Functional Requirements

System functional requirements by user types.
Pilot

- Check the status of the vehicle and its components.
- Request pit stop.

Technical team

- Check the connection with the server to verify that everything is working correctly.
- Consult specific data from each of the sensors during the race.
- Perform vehicle diagnosis.

Engineer in charge

- Consult the dashboard data.
- Request a pit stop.
- Verify the reliability of the server connection with the data collection of each sensor.

## 3.5 Specific Business Requirements

*The technology will only function with personal car users at first; it must operate directly with them.*

- *Enhances real-time data collecting and provides precise measurements by utilizing several sensors.*

- *Make regular money from every sold device—hardware and software included.*
- *Projection of real-time data, pitching the graphical user interface as a way to get real-time sports event information.*

- *It is anticipated that this will become a common system feature in all contemporary automobiles, making it possible for a basic display to function in all common car models.*

## 3.6 System Requirements

- *Vehicle data must be shown by the system instantly.*

- *Based on the gathered and compared data, the system must be able to display potential events.*

- *The system must have a simple, intuitive design.*

- *If the modifications are determined by the contracting business to be essential, then they will be implemented.*

- *The data is stored in the vehicle and may be retrieved and uploaded upon request. The database will mostly be private to all users. The creation and updating of new data will be contingent upon the vehicle's intended usage. for instance (it expects to brake earlier in the event of rain; it will use more gasoline in the event of traffic)*

- *The data will be projected in real time by the system.*

- *The user can make visual modifications to the system.*

- *All required vehicles can be used with the system.*

## 3.7 Future Requirements

*Future iterations will implement it in racing vehicles to enhance both the car's and the driver's performance during competition.*

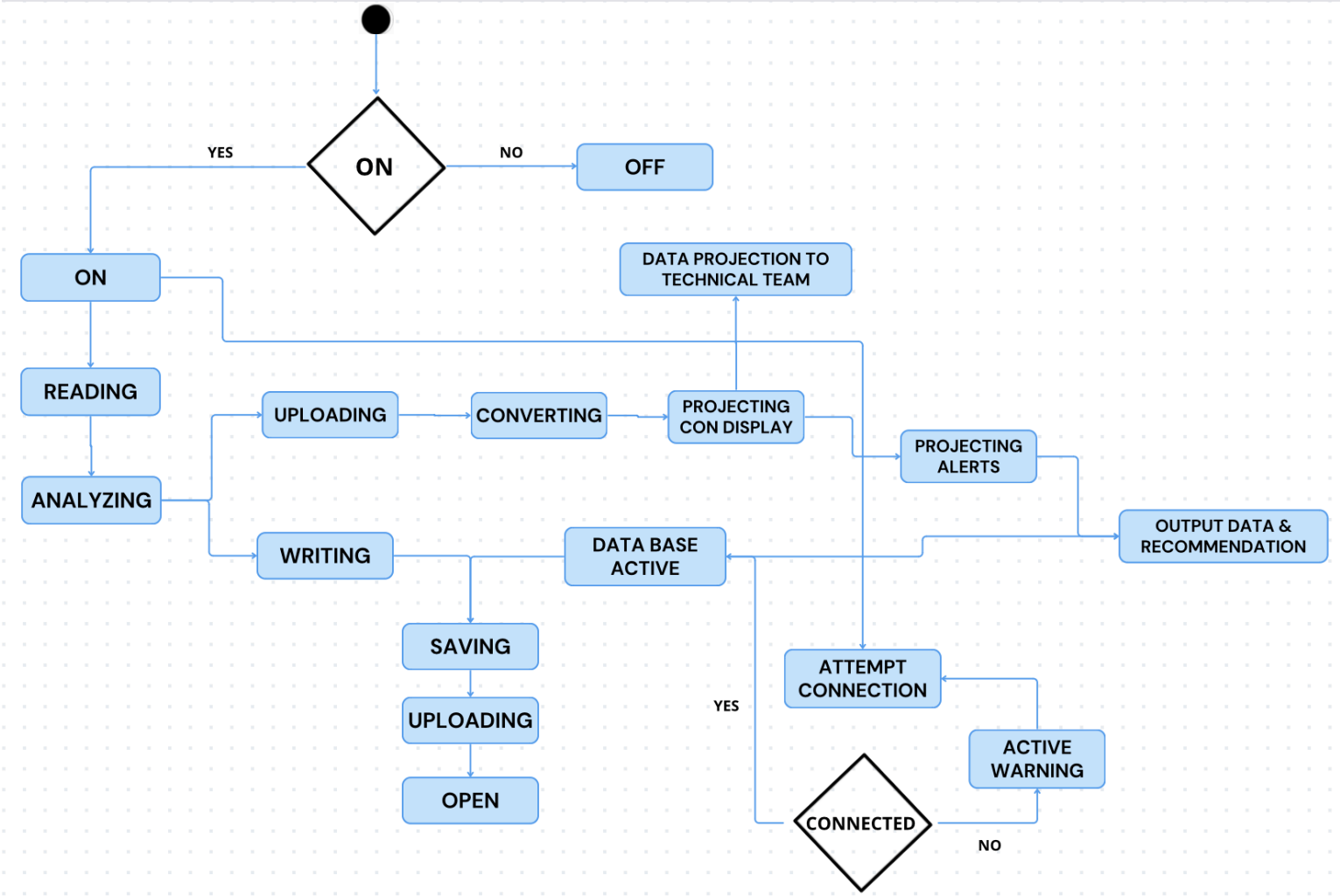
## 3.8 Other Requirements

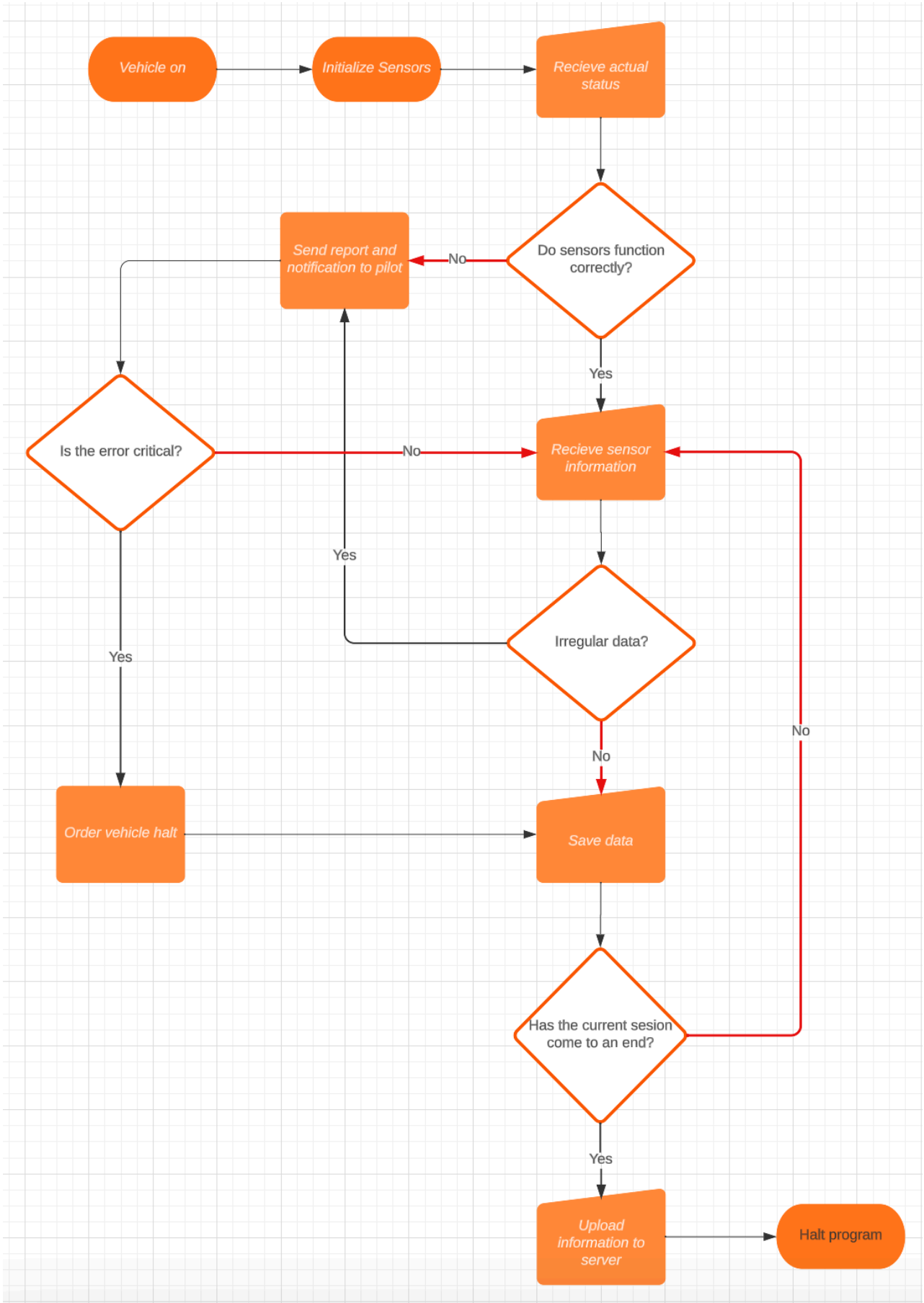
*To ensure that user security is unaffected in any way, we will work to strengthen the precision that our system requires.*

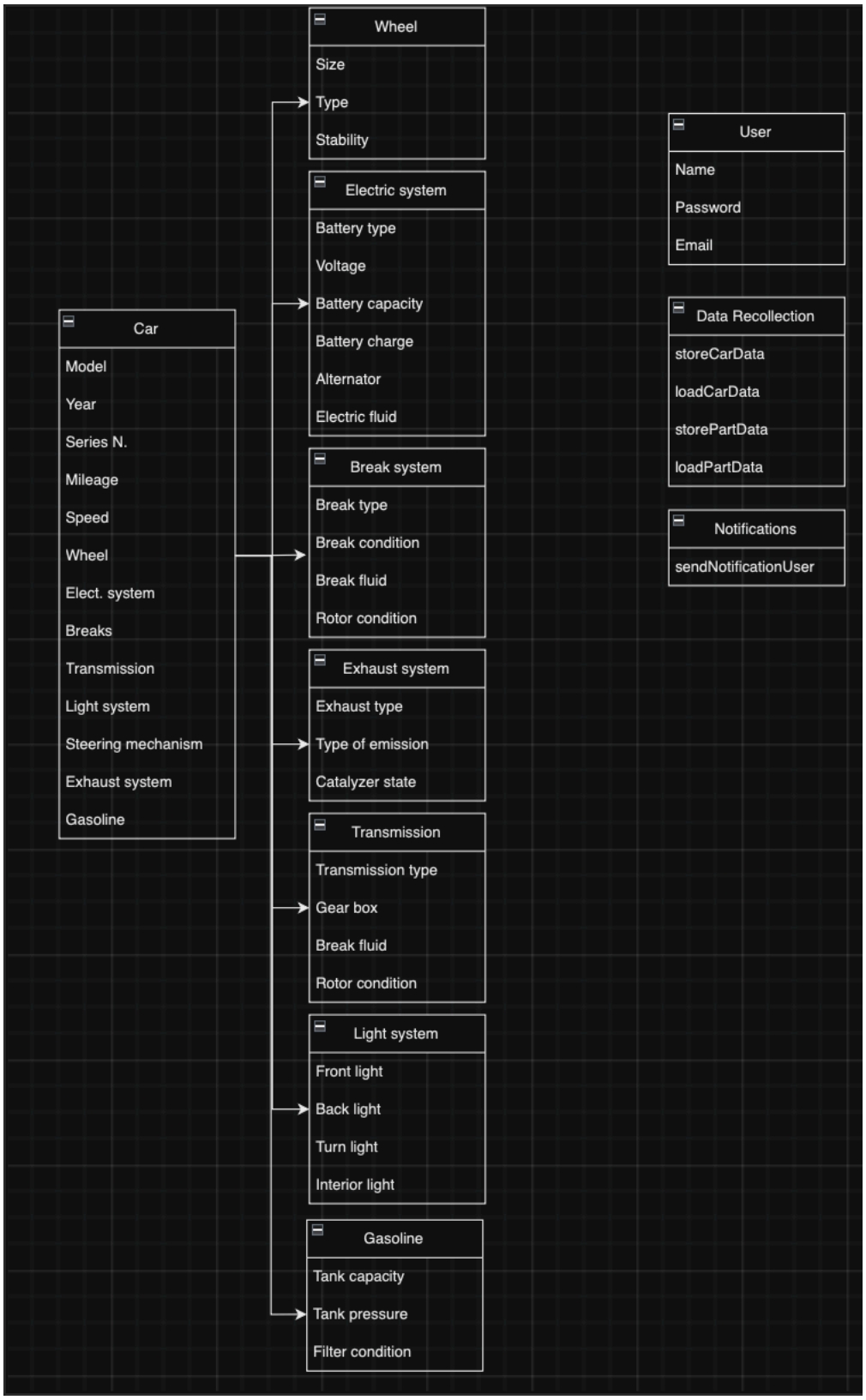
*It is meant to be used in racing automobiles in the future to increase the vehicle's longevity and dependability.*

# 4. Appendices

***A.*** *System State Diagram as a general description of the operation of the sensors.*




Vehicle on
Initialize Sensors
Recieve actual status
Do sensors function correctly?
No
Send report and notification to pilot
Yes
Is the error critical?
No
Recieve sensor information
Yes
Irregular data?
Yes
No
No
Order vehicle halt
Save data
Has the current sesion come to an end?
Yes
Upload information to server
Halt program


Wheel
Size
Type
Stability
Electric system
Battery type
Voltage
Battery capacity
Battery charge
Alternator
Electric fluid
Break system
Break type
Break condition
Break fluid
Rotor condition
Exhaust system
Exhaust type
Type of emission
Catalyzer state
Transmission
Transmission type
Gear box
Break fluid
Rotor condition
Light system
Front light
Back light
Turn light
Interior light
Gasoline
Tank capacity
Tank pressure
Filter condition
Car
Model
Year
Series N.
Mileage
Speed
Wheel
Elect. system
Breaks
Transmission
Light system
Steering mechanism
Exhaust system
Gasoline
User
Name
Password
Email
Data Recollection
storeCarData
loadCarData
storePartData
loadPartData
Notifications
sendNotificationUser

# 5. Conclusion

*The experience of working on this specific project has been rewarding since it has provided a thorough understanding of the complexities of software development, especially as it relates to the Telemetry Dashboard Software. The work that went into it went beyond just creating an explanatory text; instead, it involved a thorough investigation of every aspect, guaranteeing a presentation that was both comprehensive and easily understood.*

*One important finding concerned the vital significance of selecting a suitable software model that is adapted to the particular requirements of the project and possible clients. Alongside this epiphany, I realized that conducting insightful and mutually useful interviews—from the opening to the closing questions—is the key to having great client contacts. One strategically important phase in this process turned out to be the development of a well-considered bank of questions.*

*The most important lesson is that software needs must be carefully elicited. One notable milestone was the creation of the Software Requirements Specification (SRS), which made it easier to understand the wide range of features that a software product must have. The SRS's meticulousness guarantees that the project's parameters are met and that it is in line with the client's expectations.*

*The recurring theme among the reflection is the need of mastering customized tasks while satisfying customer requests. They emphasize how important it is to fully comprehend the selected software model, carry out efficient customer interviews, and adopt the methodical process of creating an SRS. In the end, this experience demonstrated the person's progress toward accuracy, clear communication, and the productive creation of superior software solutions customized to meet customer demands.*