International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 03 | March - 2023 Impact Factor: 7.185 ISSN: 2582-3930

Vehicle Overload Detection System

Nilesh Wadile, Roshani Patil, Paurnima Rashinkar, Swarnim Jain

Prof. Jayashri Bhoj
Department of Computer Engineering SITRC, Nashik

Abstract - With the rapid growth of the market economy, the volume of export and import by road transportation has increased. At the same time, the distribution of supplies is increasing because of the daily demand of the people. As a result, truck loads have increased and truck accidents are on the rise. Even though there are numerous methods to measure the truck's goods including those like weighing bridge, strip sensors, industrial load sensors etc., Accuracy in these techniques are questionable. So, this project gives an optimal solution for measuring truck's goods weight loading capacity alone. The accuracy in measurement is met by the use of load cell involving Arduino Uno microcontroller. By this technology, tries to avoid vehicle accidents and material damage.

1.INTRODUCTION

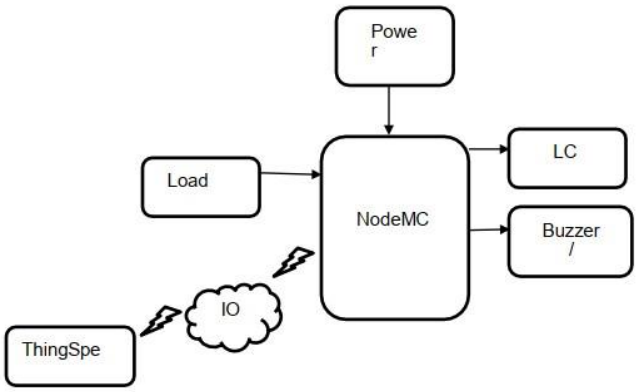
This system proposes the dynamic method for estimation of truck load weight based on the compression of suspension. Conventional method for estimation of truck load weight depends on the weighing stations which are regularly introduced close to the highways. The present framework has a genuine burden that the truck must be conveyed to the weighing station every time to quantify the load which causes wastage of time and it additionally includes false estimation of weight. The proposed technique beats these downsides with the use of sensors and GSM module. This framework utilizes ultrasonic sensors for dynamic estimation of load weight. These sensors are appended to the base of the truck's holder. At the point when the truck is stacked, the heaviness of the load causes compression of suspension of the truck because of this there is variation in distance delivered by ultrasonic sensors.

The normal estimation of the distances obtained by different ultrasonic sensors are taken to calculate the weight. With the various statures acquired, weight of the load can be estimated by experimentation strategy by utilizing known standard loads. This determined weight is shown in LCD screen conveyed in the driver's lodge. At the point when the heaviness of the load surpasses the limit esteem which is set by government standards amid establishment, motor start is halted which makes the truck to remain rest and does not encounter any movement. In the event that the vehicle is continually over-burden, the information are sent to the nearby regional transport office (RTO) through SMS so the drivers can be accused of punishment when the vehicle seeks the fitness test.

2. Body of Paper

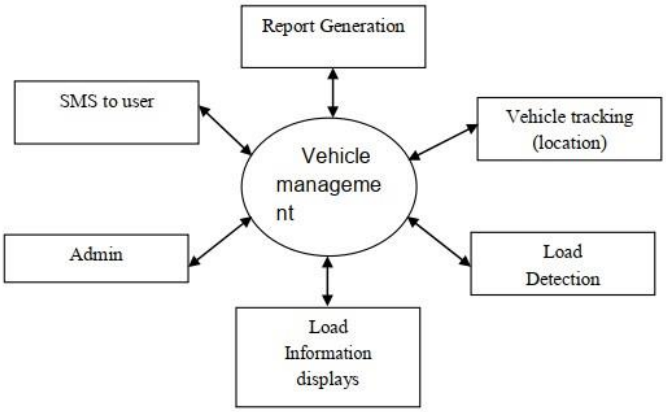
The system will process on the data provided by the sensor which includes the database of vehicle number, load, etc. which will be combined to produce data of vehicle for the today's session. Than after the further process it will send message to the user. After the message will record store in database. The the load detection will be used to calculate the load in the vehicle.

Fig. Block Diagram



DFD Diagram

DFD-Level 0



A Data flow diagram(DFD) maps out the flow of information for any system or any process.

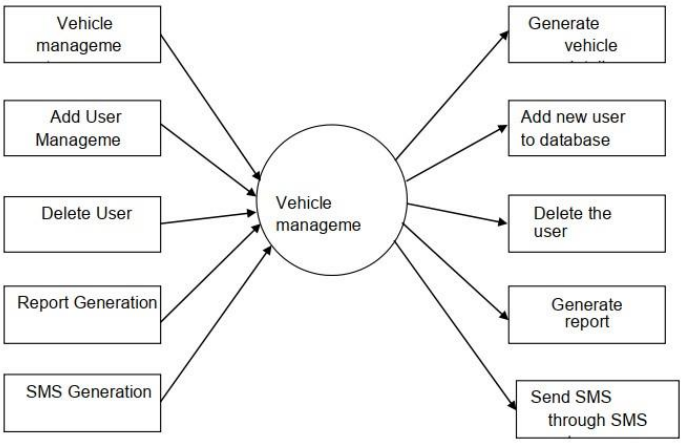
This DFD of "level-0" involves the complete overview of the system in an simple way.

It uses defined symbols like rectangle, circle, and arrows, plus short text labels to show

data inputs, outputs, storage points and routes between each destination.

his simple diagram shows simple flow of the system which includes the various fields like Admin load information, load detection, etc

DFD-Level 1



This DFD of "level 1" is displaying the detailed overview of the entire system, which covers all the user inputs and all the executed commands.

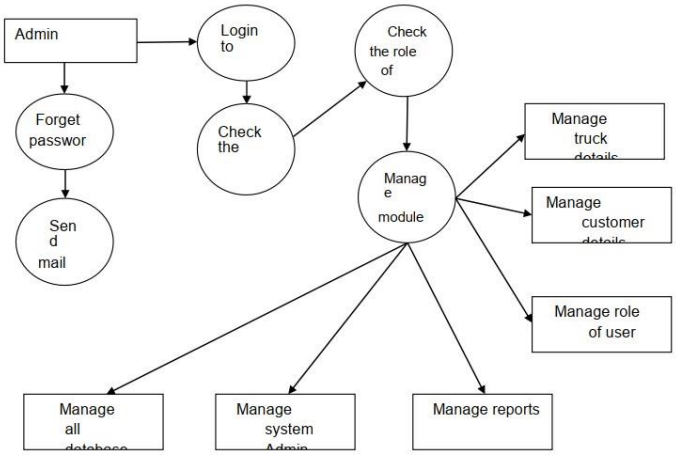
Admin adds the new user and that information is added to the main database. So the data can be accessed by the Admin at the time he needs.

The Add User will add new users and the delete user will delete the user when the work of that user is been finished.

After sensing the load the system will generate an report which will include the vehicle number, user name, load of the vehicle and also the status of vehicle, i.e. Overloaded or

Underweight.

DFD-Level 2



The level 2 provides more specification of the modules. Each module is specified correctly.

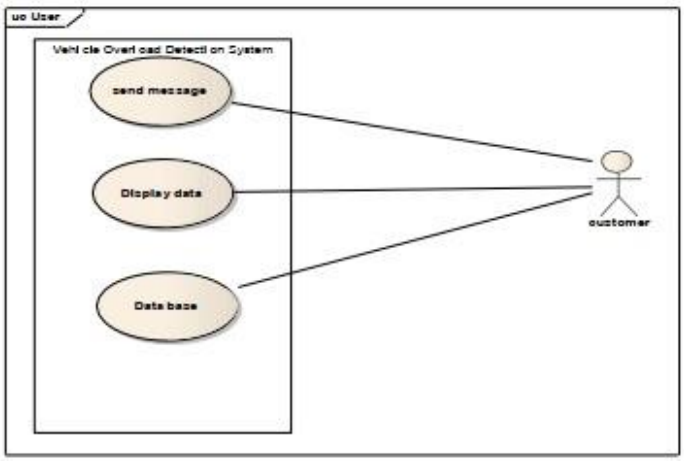
Here the system will generate the SMS and send it to the specific user to their registered number.

Use Case Diagram

Use case diagrams are usually referred to as behavior diagrams used to describe a set of actions (use cases) that some system or systems (subject) should or can perform in collaboration with one or more external users of the system (actors).
A use case is a methodology used in system analysis. Our system consists of one actor i.e. customer.

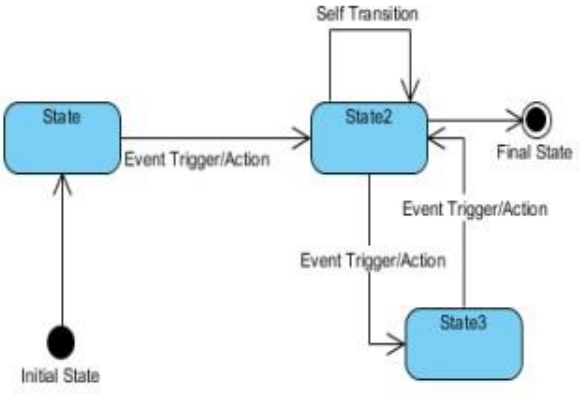
Actor used in system are:
1) Customer: - The customer will have all the information related to the message of overloaded vehicle.

Entity used in systems are:
1) Send message:- Using the GSM module the message will be sended to the user.
2) Display data:- Display data includes the displaying the weight of the vehicle.
3) Database:- Database of the system.



State Diagram

A state diagram is a type of diagram used in computer science and related fields to describe the behavior of systems. State diagrams require that the system described is composed of a finite number of states; sometimes, this is indeed the case, while at other times this is a reasonable abstraction.
Initially the system will have a state to sense the load of the vehicle. When the load is being sensed the system will alert for an message using the GSM module and the will give an alert for the overloaded vehicle.



3. CONCLUSIONS

The Arduino based automatic truck load monitoring system is implemented. The load sensor measures the goods weight and sends the value to the Arduino by using HX711 Module. GSM module is used for communication and location purpose respectively. Due to overloading they gain extra money but the safety of the driver cannot be assured so to avoid accident and to reduce the unethical activities.

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