



Parshvanath Charitable Trust's
A. P. SHAH INSTITUTE OF TECHNOLOGY
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(Religious Jain Minority)

Intelligent Accident Management System

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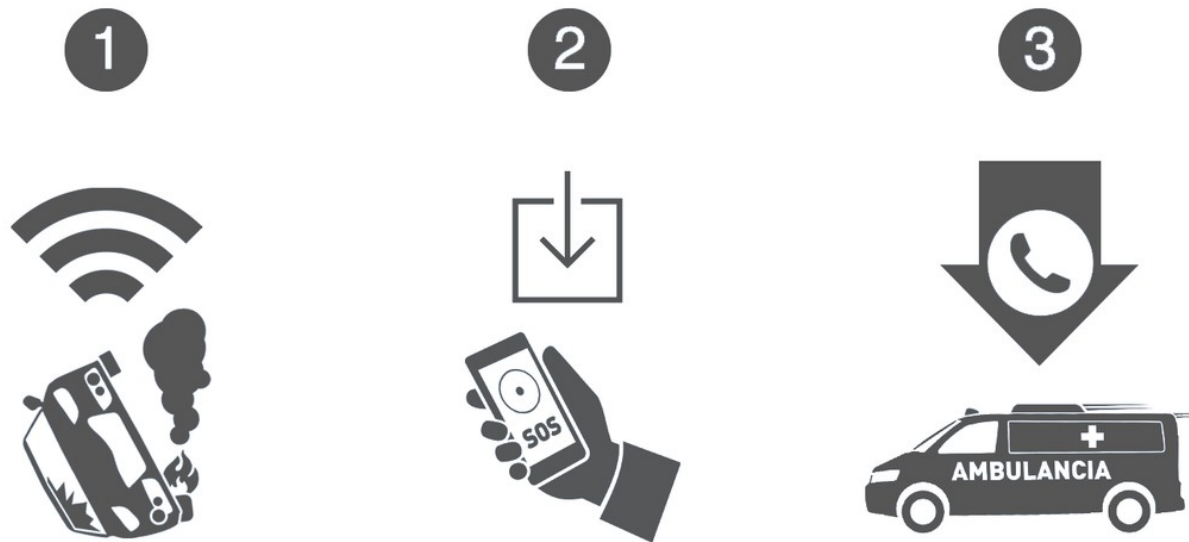
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Abstract

The Indian Ministry of Road Transport and Highways reports that around 4,06,730 accidents take place each year and close to 86,000 are killed! In frequently crowded areas like cities or highways, more than 65% lives are lost due to delay in the arrival of emergency services. If we consider accidents taking place in secluded areas, then the percentage of lives lost is even more. With an aim to reduce these numbers to as little as possible, we propose a system which makes use of IoT sensors along with Cloud Computing.

Introduction

- In our project, we present the modelling, implementation and testing of a Smart Accident Management system based on IoT and Cloud Computing.
- At the time of accident, IoT sensors will be used to determine the impact of damage caused by the collision. Based on the impact index, a text message will be sent to nearby authorities and/or emergency service providers.



Objectives

- ▣ Providing smart assistance to the car crash victim.
- ▣ To develop a cheap state-of-art system for vehicles.

Literature Review

Title: Real-Time Crash Detection Analysis and Emergency Alert Using Smartphone

Authors: Harit Sharma, Ravi Kanth Reddy, Archana Karthik

Publication Details : International Conference on Connected Vehicles (ICCVE), 2016

Findings: Detecting car crashes using sensors present inside mobile phones.

Advantages: Makes use of in-built sensors, so does not require any additional components/modules.

Disadvantages: Makes use of a mobile device for car crash detection.

Paper 2

Title: Intelligent Accident Management System Using IoT and Cloud.

Authors: Akriti Singhal, Sarishma, Ravi Tomar

Publication Details: 2nd Intl. Conference on Next Generation Computing Technologies (NGCT), 2016

Findings: Detecting car crashes using IoT sensors and uploading the data on Cloud using GSM module.

Advantages: Data is uploaded to cloud.

Disadvantages: Low processing speed and internet speed due to microcontroller and GSM module respectively.

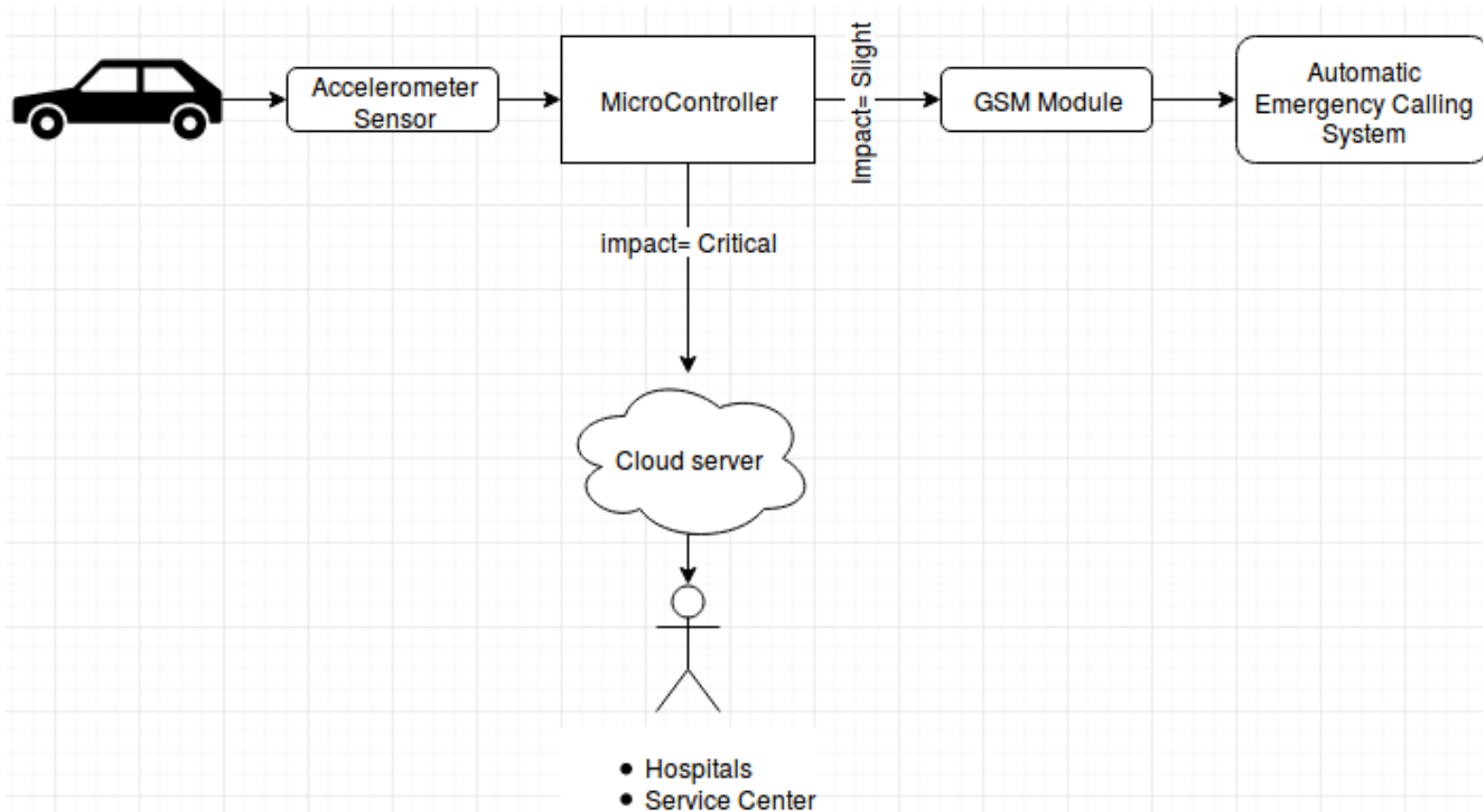
Literature Review

Paper Title	Year	Limitation(s)
Real-Time Crash Detection Analysis and Emergency Alert Using Smartphone.	2016	Smartphone can get totally destroyed.
Intelligent Accident Management System Using IoT and Cloud.	2016	Makes use of a Microcontroller.

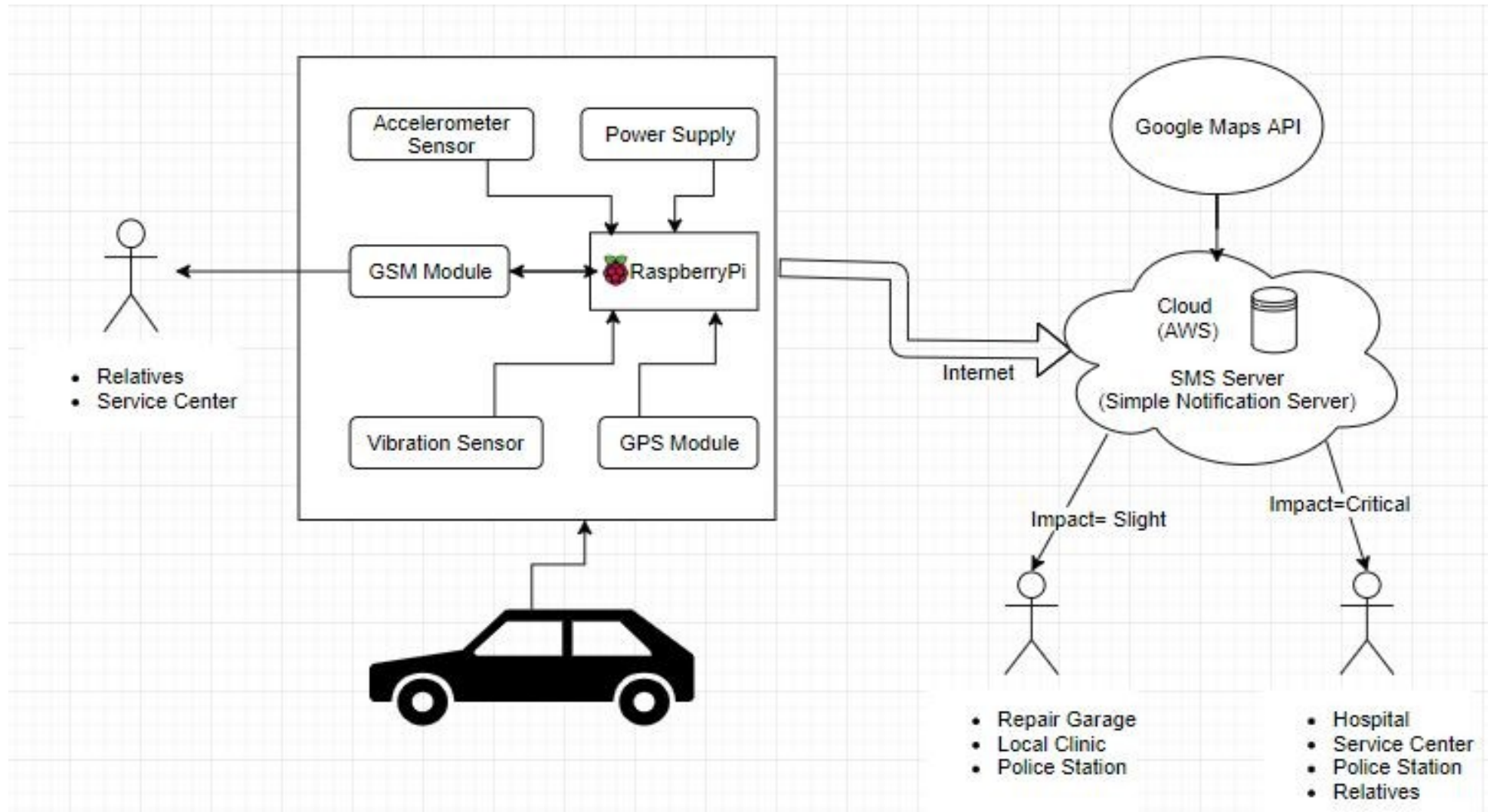
Problem Definition

To create an assistive system for car crash victims which will automatically alert nearby authorities who can arrive on the scene in quick succession of time, thereby possibly saving the victim's life. Based on the impact of collision, the system will automatically send a notification to the service stations, local clinics, police stations, hospitals, etc.

Existing System Architecture



Proposed System Architecture



Technology Stack

Hardware:	Software:
Raspberry Pi 3B	Python
GSM Module	MySQL
GPS Module	AWS
Accelerometer	Google Maps API
Vibration Sensor	

Working

- ▣ At the time of collision, the accelerometer will detect an abnormal change in the acceleration. This change in acceleration will be mapped on an intensity scale.
- ▣ The exact coordinates of the crash will be determined with the help of a GPS module and they will be sent to the Cloud.
- ▣ If impact is low, Cloud will send an emergency alert to the nearby clinics, garages, etc.
- ▣ If impact is high, Cloud will send an emergency alert to the nearby Hospitals, Service Centers, Police Stations, relatives, etc .
- ▣ In case of unavailability of internet, GSM module will be used to send SMS to hospitals and relatives.

Scope of Project

- With the ever increasing number of vehicles, the number of accidents taking place is also increasing exponentially. In order to aid the car crash victims, we propose a system that makes use of various IoT sensors that are capable of determining the collision impact and sending automatic alerts to the help providers.
- Also, the implemented system will be a lot more cheaper than the automatic accident detection systems that are currently present only in high-end cars.

Limitation(s)

In case of areas where there is no internet connectivity available , the higher speeds of Raspberry Pi will be sacrificed and a much slower GSM module will be used.

References

- [1] <https://ieeexplore.ieee.org/document/7877395>
Intelligent Accident Management System using IoT and Cloud
Akriti Singhal ; Sarishma ; Ravi Tomar
October, 2016
- [2] <https://ieeexplore.ieee.org/document/7800181>
S-CarCrash: Real-time crash detection analysis and emergency alert using smartphone
Harit Sharma ; Ravi Kanth Reddy ; Archana Karthik
September, 2016

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THANK YOU !!