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Low-cost sensor band with emergency transport services or rural/tribal areas

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Abstract: Technologies advancements are happening at a faster rate in cities and town, mostly urban areas. But the same advancements are not reaching the rural areas, so our project aims at providing a technology - the low-cost sensor band to the people in rural/ tribals to detect any abnormal vital signs. Ambulances are scarce in rural/ tribal areas, so we provide a vehicle unit to a tractor or motorcycle ambulance or any other vehicle. The nearest vehicle takes the patient to the nearest medical center. UNICEF has provided with a motorcycle ambulance to most of the villages around India, which partly solves the transport problem in our project.

Keywords: IoT health-based monitoring system, low-cost sensor,

I. INTRODUCTION

Our project domain is IoT. Internet of Things, in simple words, IoT described network of physical objects embedded with sensors, software, others for connecting devices and exchanging data. IoT applications have increased at a faster rate recently. It's used in wearables (watches, tracking belts), health (monitoring vital signs), traffic management in large cities using GPS, farming (assessing soil condition) and many others. Our project comes under IoT in healthcare system for monitoring vital signs and providing emergency transport vehicle. Our project is basically a digitalized nursing system, where the patient's health condition is thoroughly monitored, and medical service is given at the time of need.

II. RELATED SURVEY

Technologies have been developing at a faster rate in the urban areas but not in the rural or the tribal areas. Rural health care system is not well structured leading to many deaths; a few which can be saved if the patient is brought to a medical facility on time. Our project focus on the well-being of every villager. But our 3 cases of study – malnourished kid and pregnant woman and an old-aged man in rural/ tribal areas will be our top priorities. [1]

Aim of our project - to save a person's life, sense the vitals of a person during their illness and call out for the nearest vehicle to be transported to the nearest hospital. [2]

Our first step would be to team up with a NGO, one such NGO is Team Hasiru based in Bengaluru. And to visit villages. There are 1,45,000 tribal villages approximately. And rural villages have also increased by 0.9% from 2019 to 2020. We intent to cover as many villages as possible. Do an initial checkup, get to know each person's medical history, store it in our database and provide our sensor band with unique reference ID. [3]

In the project, we are using two Arduino micro-controllers, one in the Sensor Band unit and the other in the Vehicle unit. We have the LCD display on the Vehicle unit to give the readings of the particular user. The signal is sent to the driver through a live location message on Telegram. [4]

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Due to the pandemic hitting the world in the year of 2020, various parts of the rural and tribal areas are getting adopted to the digital world, so there would be no problem of accessing the location of the patient due to many villagers having the knowledge of how to use a mobile phone. [5]

While wearing the band, if any abnormality is detected, a signal is sent to nearest vehicle unit. Or if a person feels he needs medical service, he may send a signal by pressing a button. The nearest vehicle unit reaches the person. Takes to the nearest medical center. Patient's medical history can be accessed using their unique reference ID and treatment is given accordingly. [6]

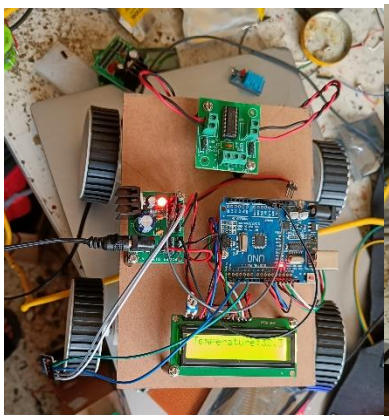

Fig 1.1 Vehicle Unit

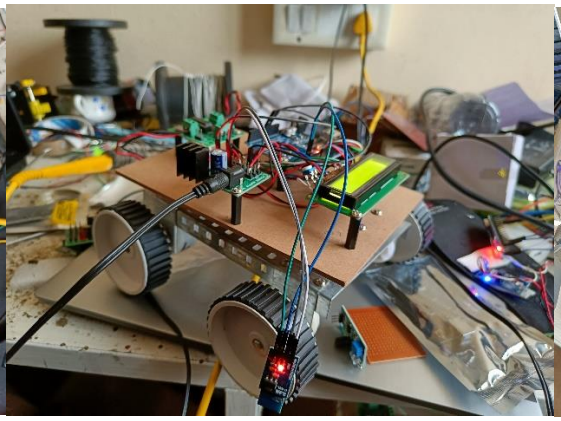

Fig 1.2 Vehicle Unit

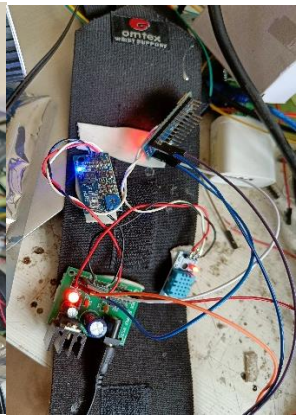

Fig 1.3 Sensor Band Unit

III.CONCLUSION

Overall, our project is aimed at saving the lives of the ones in the rural/ tribal areas by assessing their vitals and getting a vehicle unit to the nearest hospital. Accuracy of project can be increased by using Wi-fi. The range of the signals can be increased using LoRa module. Adding oxygen saturation sensor with higher accuracy enables us to evaluate the person's health with a much better capability. To launch as an app on Google Play Store or Apple Store and also to add sensors to detect other necessary vital signs according to a person's specific health; the project can be improved upon for future work.

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