



Application Form

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Problem Identification

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| 1 | Identification and Justification of Problem (maximum 100 words) | The proposed system is an IOT based prototype which can be used by senior citizens during quarantine. During the home quarantine it is difficult for the senior citizens to get their vitals checked regularly because of the risk of infecting other individuals. In case the vitals exceed their standard levels, alerts will be sent to hospitals or clinics to provide medical assistance to the senior citizens. There are Alzheimer patients who may come out of their houses; thus, a GPS will be attached to locate the senior citizen. When they move out of their home's alerts will be sent. |
| 2 | village / Study area / location (maximum 50-100 words) | The study areas are the homes where senior citizens reside or old age homes. There are senior citizens who suffer from physical or mental ailments who require their vitals to be checked regularly. But being in home quarantine, involving another person to check will increase the risk of spreading the virus. |
| 3 | Description of problem (Challenges/felt need/Market opportunities) (maximum 50-100 words) | Senior citizens owing to their age have physical ailments, they may have memory loss issues, they might not be able to comprehend the current pandemic as they lack understanding of the harm the virus could cause to them. If they are in home quarantine, they require their vitals to be checked regularly but this would cause infecting another individual. Thus, the process of fetching vitals from the patients had to be done without involving another person. Technical challenges: Sensors such as thermal sensors are required to be used. All the sensors and the power source have to be combined in one compact device. SPO2 sensor is used to measure the oxygen saturation level, temperature sensor is used to measure the temperature. The device has to be designed such that it is cheap, not easily removable and it requires a power source which will enable it for 15 day. It should be designed in such a way that it is a use and throw band. |

Description of Proposed solution

<p>4 Brief description of innovative Solution (maximum 250 words)</p>	<p>The smart band will have the following features: 1. Sensors that will measure oxygen levels and body temperature. When the vitals exceed their standard levels alerts will be sent to get immediate medical assistance. 2. GPS locator that ensures the senior citizens are at home. If they move out of their home's alerts will be sent. 3. The band will be designed such that it is cheap, compact, not easily removable and such that after 15 days it can be disposed of safely. 4. The battery(130-420mAh) life of the band will be for 15 days (time duration of quarantine). 5. Wearable devices suitable for monitoring the populations at risk and those in quarantine, both for evaluating the health status of caregivers and management personnel, and for facilitating triage processes for admission to hospitals. 6. Sensing systems for detecting the heart-beat, oxygen saturation, temperature for monitoring patients in quarantine with relatively mild symptoms whose clinical situation could suddenly worsen. These details are stored in a database and when these values exceed the given threshold value then the hospital officials will receive a message. 7. Since there are not enough facilities for quarantining people, the band also tracks the GPS location of the user and when the user leaved the location prescribed for quarantine, then the health officials receive a message. 8. Telehealth technologies for the remote monitoring and diagnosis of COVID-19 and related diseases. Finally, further challenges and opportunities for future directions of development are highlighted. Once the pandemic is over, the band can be used as a normal health band.</p>
<p>5 Description of the technology/management practices involved in innovative solution to achieve to given objective.(maximum 200 words)</p>	<p>The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. A microprocessor accepts binary data as input, processes that data, and then provides output based on the instructions stored in the memory. The data is processed using the microprocessor's ALU (arithmetical and logical unit), control unit, and a register array. The register array processes the data via a number of registers that act as temporary fast access memory locations. The flow of instructions and data through the system is managed by the control unit. These could be for chips for small devices, such as smartwatches, sensors for monitoring physiological functions (which can communicate with a heart rate monitor, for instance) or sensors for the Internet of Things. Hardware: 1. Microcontroller – Arduino nano controller. It used because it is small in size and can easily be used in bands. 2. LCD Display – LCD is used for viewing values from a distance. 3. SPO2 Sensor – SPO2 sensor is used to measure the oxygen saturation level. 4. Temperature Sensor – Temperature Sensor is used to measure the temperature. 5. Switch – An emergency switch for the patients incase they have any emergency. 6. GPS – GPS is used to locate the patient's address. 7. NODEMCU – NODEMCU is an IOT communicator. Software: I. Embedded C II. Keil Microvision / Arduino IDE III. Flash Magic</p>
<p>6 (a)Target beneficiary group/ anticipated size of market for (a) proposed solution/innovation (maximum 100 words)</p>	<p>According to Population Census 2011, there are nearly 104 million elderly persons (aged 60 years or above) in India; 53 million females and 51 million males. A report released by the United Nations Population Fund and HelpAge India suggests that the number of elderly persons is expected to grow to 173 million by 2026. in India, with increased life expectancy and an ageing population, it is estimated that over 5.3 million people live with dementia (a syndrome in which memory, thinking, communication and social abilities deteriorate), of which Alzheimer's is the most common cause. This figure is set to rise to 7.6 million in 2030, according to the Dementia in India Report 2020 published by the Alzheimer's and Related Disorders Society of India (ARDSI). The prevalence of disability increases with age (from 23.7% for age 60-64 years to 63.8% for age >75 years). This is the market for our project.</p>

6 (b)	(b)Expected outcomes/outputs(short term/medium term/long term)	In this project, an overview of wearable devices, unobtrusive sensing and telehealth with their potential applications in the fight against COVID-19 is presented. With successful implementation and deployment of these emerging technologies during the evolving pandemic, the burden on healthcare systems can be reduced by shifting service and care from hospital to improvised hospital and home; the clinical outcome can be improved through timely intervention by identifying any deterioration at an early time; the diagnosis and treatment can be rapid with screening of suspected cases; and the contacts between medical staff and patients can be minimized by remote monitoring and care. They are therefore very promising for combating pandemics such as COVID-19.
7	Brief description of implementation of delivery and business model/startup(if any) (maximum 100 words)	The system uses microcontroller. A SPO2 sensor, and Temperature sensor are connected to the Microcontroller. The temperature sensor gives the temperature value in degree Celsius. To measure the heart rate, the heart beat/pulse is detected and the number of pulses for one minute is counted to get the beats per minute. Light (using an LED) is passed from one side of the finger and the intensity of light received on the other side is measured (using an LDR). The GPS and Nodemcu modules are interfaced with the microcontroller. The GPS module finds out the latitude and longitude of the patient. The temperature and Spo2 values are measured and compared with a configurable threshold to be classified as "low", "normal" or "high". The Nodemcu module is used to send a message to the doctor's mobile in case of emergencies. The message contains the temperature, Spo2 values and the patient's latitude and longitude. The doctor can thus take immediate action with the help of this alert system and if in case of changing the position of Covid Patient also detect by using GPS value and send alert to the concern persons. The concept of IOT (Internet of Things) has been implemented by sending the collected data to an Thing speak or Blynk. A map of the entire region is generated using the patient's geographic coordinates with the help of the Google Maps API. The map will display all the nearby doctors/hospitals in that region with contact and route details. The patient can choose a doctor from this list of doctors for consultation in case of emergencies.
8	Description of support/ecosystem provided by/available at institute to facilitate the startup(if any- to be filled by mentor) (max 150 words)	<ul style="list-style-type: none"> • Obtaining Initial Financial Support (Grants, Seed Capital, Support for Recurring Expenses etc.) • Marketing Assistance/Market Research/Pilot Study/Test Marketing. • Enhancement of Marketing Skills, Commercialization/Scale up. • Access to Bank Loans, Loan Funds and Access to Angel Investors or Venture Capital etc. • Business Structuring Advisory: Help with Accounting/Financial Management/ Company Formation/Management Team Identification/HR Services • Access to IT Tools/ Better Business Solutions/Expansion etc. and to help with Presentation Skills and Business Etiquettes • Networking Activities: Links to Strategic Partners; • Links to Higher Education Resources/R&D Labs/Facilities • Technology Commercialization Assistance and Management Evaluation • Help with Regulatory Compliance like Intellectual Property Rights/Management • A Full time functioning IoT lab is available in our department for developing projects related to • Home Automation, Automated Street light, Environment Monitoring, Soil Monitoring, Smart city-Transport, Water supply, Garbage collection and Parking systems
9	Highlight the Novelty of your idea provided. (max 100 words)	The novelty of this project lies in the following points, 1. Prospective price of the watch (it is a lot cheaper than the commercialised smart bands in the market). 2. It has sensors that measure the oxygen and body temperature. This data can be reverted back to their doctor and assistance could be provided in case of instable vitals. 3. GPS locators ensures the patients are quarantined and safe, at home. 4. The band is designed to not be easily removable and have a battery of up to 15 days.

