IICDC 2019 Proposal

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College Name: Manipal Institute of Technology, Manipal

Title of Idea: CLIMB (Climber's Live Information Monitoring Band)

BUSINESS DETAILS

Project Abstract

What's the problem?

Adventure enthusiasts and mountaineers face many problems while climbing. These include lack of real-time health monitoring and inability to communicate efficiently with other climbers. Safety is a major issue for the mountaineers. Dangers such as low heart rate, accidents, losing their way etc. are often times fatal for them. Poor visibility, cold temperatures, treacherous terrain all lead to trouble for the climbers. They also face difficulty in contacting emergency services in times of distress.

Give a brief abstract our idea/problem being solved

CLIMB (Climbers Live Information Monitoring Band) is a **multi-functional**, **sensor-equipped**, **wearable device** that will assist mountaineers while climbing and will help them counter all the issues faced by them. It monitors heart-rate, oxygen level, provides a hands-free communication facility for signaling other climbers, a navigational feature for path-planning and a distress signal. All this is packed into a wearable device to make the user's experience hassle-free.

Why does solving the problem matter? Describe the impact of your solution in terms of efficiency, throughput, cost saving, etc.

The recent rise in mountaineering related accidents has led to the ideation of CLIMB. The hostile conditions of high-altitude trekking make mountaineering a dangerous prospect even for the most skilled climbers. Solving these problems would make mountaineering a much safer and easier process for the mountaineers.

The current market solution for user to user communication is via the use of radios (walkie-talkies). It is impossible to communicate live health data via this medium. CLIMB efficiently replaces the radio system with a close-range wireless or Bluetooth module.

Since CLIMB carries out the job of fitness trackers as well, it results in cutting down the need to purchase a separate GPS, health tracker and a radio system. This can help mountaineers cut down on the costs of climbing.

Market Analysis

Customer Need Identification

Mountaineers and adventure enthusiasts usually don't take the easy way out! However even they welcome technological assistance at times. These include:

1. Real-time health monitoring
2. Hands-free communication with other climbers
3. Tracking information
4. Sending distress signals in case of an emergency
5. Navigation and path planning
6. Weather Forecast

Serviceable Addressable Market (SAM) Identification & Justification

Expedition Groups and Adventure Enthusiasts

Our target customers are the population of the country that seek adventure and are mountaineering enthusiasts.

Mountaineering, being an activity that involves a lot of risk, our product aims to assist the mountaineer by providing real time data about health vitals. It ensures that the user has a safe and better experience while climbing.

Product Differentiation w.r.t. Competition & Justification

Products that provide the above services do exist in the market but none of them target mountaineering specifically, hence mountaineers have to get each of these devices separately which adds to the weight they carry. Also, handling multiple such devices while climbing is inconvenient and these products may not provide satisfactory service since their original purpose is not intended for mountaineering. Products that are specific to mountaineering include mainly improved harnesses. Hence integrating these features into one device would be very beneficial.

Understanding of your customer & user

On interacting with potential customers and our mentors we realized that the key to marketing our product is to give them a safe and better experience. They require a light-weight and convenient solution to the problems that they face. Hence, our wearable is ideal for the mountaineers.

Distribution Channel Identification

- Advertisements through e commerce websites such as Amazon, Flipkart and Snapdeal.
- Partnering with expedition groups, travel agencies and adventure sport companies to advertise our product as an add-on.
- Marketing at sporting equipment stores, shopping malls and E-commerce websites.

TECHNICAL DETAILS

Product Brief

What is your core technical innovation?

The central idea of CLIMB is to provide a user to user communications system through which a climber's health data can be shared with the rest of the climbers when it is outside the healthy range. This will enhance the safety of the entire climb. The device is designed to relay data like heart rate, blood oxygen saturation, altitude and geo-location to every other device in the climbers' group which allows for the device to warn others when a fellow climber falls behind or gets lost.

Describe the uniqueness of your product design (Novelty)

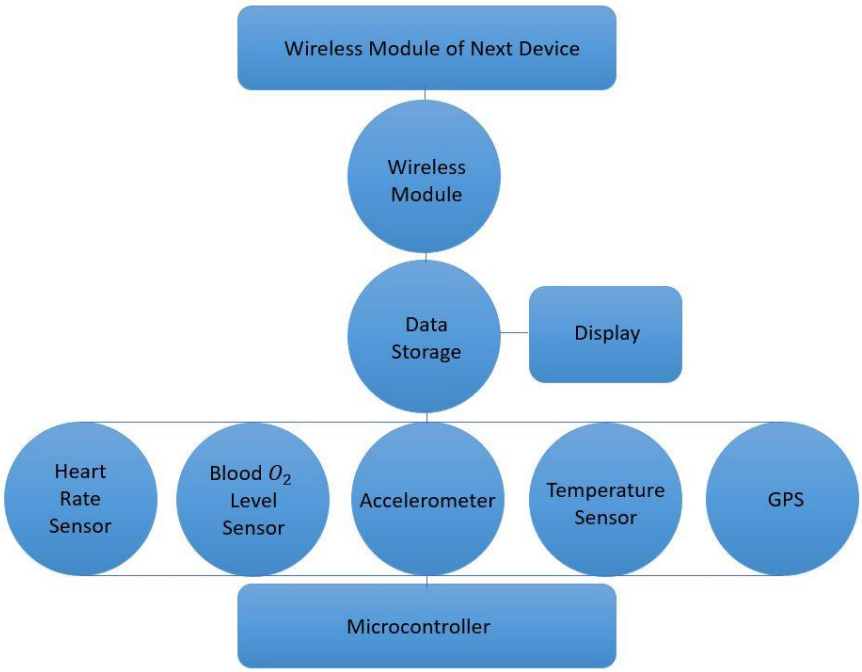
- Sleek and light-weight band
- User-friendly
- User-to-User Communication
- GPS locator which gives the current location of the user which can be used to alert authorities in case of emergencies.
- Various sensors that monitor and display vital signs such as Heart Rate and Blood Oxygen Level

Proposed Design

Block Diagram

The lowest layer consists of the microcontroller which provides centralized communication and controls all the different sensors. The sensors include the accelerometer, temperature sensor, GPS, O2 level sensor and the heart-rate monitor. These devices store all their monitored data onto a storage medium.

The data obtained from storage can be interpreted to obtain further results. For example, a combination of temperature, Oxygen and heart-rate data can be



used to determine whether a person is suffering from altitude sickness. The user can interact with the GUI to display certain features. Finally, communication between different devices is achieved using a wireless module.

Innovativeness of Proposed Solution

Most devices in the market currently cater solely to fitness tracking and GPS tracking. Some competitors are products such as Apple (Apple Watch) and Fitbit (Fitbit Versa).
CLIMB, apart from providing these features, also incorporates user-to-user communication, which makes this device ideal for mountaineers and other adventure enthusiasts.
This added functionality is absent from the bigger companies' products.
An initial cost analysis puts our approximated product cost at 120$ which is significantly lower than the Apple Watch 5 (699$) and the Fitbit Versa (200$).
Although size-wise we estimate our product to be larger, we are confident that with further optimization, the size of CLIMB can be scaled down to match the sizes of our competitors.

Impact of Proposed Solution

CLIMB can significantly reduce mountaineering accidents like climbers getting lost or suffering from health issues such as low oxygen levels and abnormal heart rates.
We have received positive feedback from discussions with mountaineers who have told us that the product, with the correct execution, will be a great tool/ to them and aid them in their activities.