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HEALTH CHECK GADGET

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Abstract - *Nowadays, many elderly and morbid patients silently die because of untimely health access. Unavailability of caretakers and regular check ups leads to many unwanted and preventable deaths. Therefore, our project aims to design a 5 in one gadget which will measure 5 parameters, namely Blood sugar, Blood pressure,Pulse rate, Body temperature, ECG on a daily basis, provided that the patient has to wear it 24/7.These parameters can be monitored and the contacts saved in the system can be contacted immediately. The main objective of our product is to reduce or eradicate untimely health access, preventable deaths, and also to reduce the number of visits to hospitals, by making home management easy.*

Key Words: **Gadget, Patient, Parameters, Blood Sugar, ECG,Body Temperature, Pulse Rate, Customers, Health, Death, Hospitals, Sensors.**

1.INTRODUCTION

People who live alone, especially the elderly people are constantly exposed to several health risks. A sudden fall or rise in blood glucose, or a sudden increase or decrease in blood pressure or a fluctuation in pulse rate goes unnoticed which can result in severe consequences and preventable deaths. Similarly in people with problems in the electrical activity of the heart, requires timely monitoring and a constant check in body temperature is required, mostly keeping the current situation in mind. So, keeping in mind all the above factors, the present work targets in monitoring all the above criteria at the same time, this lead to the development of a gadget in the shape of a band which can monitor all the 5 parameters throughout the day so that even if there is a sudden fluctuation in any of the parameters, it will be detected by the sensors and closed ones would be notified instantly so that immediate action can be taken to stop preventable deaths. The current work therefore aims at reducing untimely health access and preventable deaths and making home management easy.

2. MATERIALS AND METHODS

The band will be constructed using high grade imported sweat proof leather.

The case will be made of aluminium, stainless steel and ion strengthened glass, for durability, easy accessibility and fall resistance with waterproof technology.

2.1. Display: LED colour display with high resolution.

The gadget will be designed such that it will consist of several underlying sensors, which will together help in monitoring the different parameters such as blood pressure, pulse rate, body temperature, ECG and blood sugar.

2.2. Blood Pressure: Tonometry method: Unlike the oscillometric method in which the cuff worn on the upper arm or wrist compresses blood vessels, in the tonometry method, the pressure sensors are pressed directly against the skin to measure the pressure pulse wave and to calculate the blood pressure. If the pressure sensors are pressed against the skin above an artery, the dynamic equilibrium on the pressed surface can be expressed by the equation considering the thickness of the blood vessel wall which is based on Laplace's law and the data obtained is stored and transferred to the paired mobile.

2.3. ECG: The gadget is equipped with two electrodes: a negative electrode, which is built into the crown and a positive electrode, which is placed on the back side of the gadget. All ECG data recorded by the smartwatch were automatically transferred to the app on the paired mobile and all of these ECGs are also exported as PDF files.

2.4. Body Temperature: Use of wearable temperature sensor ICs which are digital thermometers provide clinical-grade accuracy combined with ultra-low power operation in order to support wearable fitness and medical applications to keep a track on the body temperature throughout the day.

2.5. Pulse Rate: We will use a reflection-type pulse sensor (Optical Sensors for Heart Rate Monitor) to measure pulse rate, which transmits infrared, red or green light (~550 nm) to the body and uses a photodiode to measure the amount of light reflected. Oxygenated haemoglobin present in the arterial blood has the characteristic of absorbing incident light, so we can calculate the pulse wave signal that is the pulse rate and the data can be recorded by detecting the blood flow rate (change in blood vessel volume) that varies after heart contractions over time.

2.6. Blood Sugar: We will use a biosensor to determine the blood sugar throughout the day with the data transferred to the gadget and stored and an alarming notification would be sent whenever the value fluctuates drastically so that an emergency action can be taken.

3. COMPARISONS WITH OTHER METHODS- Existing watches or fitness bands can measure a maximum of three to four parameters but cannot measure all the parameters at the same time and cannot detect an unusual rise or fall in any of parameters however this work is in developing a band which can measure all the 5 parameters throughout the day and can send an alarming notification to anyone who has their phone connected with the band so that an emergency act can be undertaken instantly. Moreover our gadget brings all these features at just a price of Rs.5000, so that it is affordable by most of the people.

4. BUSINESS MODEL CANVAS:

4.1. Key Resources:

1. Sensors(Electronics)

2. Leather Bands

3. Battery(Electronics)

4. Medical Needle

5...LED Display(Electronics)

6. Online retailers for other raw materials

7. Sophisticated modern technologies

8. Skilled labour and Capital

4.2. Key Partners:

1. Private Hospitals

2. Public Health Sectors will help in launching our product and distributing it to our target audience

3. IT and Electronic companies will act as investors and provide funding for our product and Angel Investors and Investment companies

4. Bootstrapping

4.3 Key Suppliers:

1. Online Retailers for raw materials, 2.Retailer Shops for raw materials, 3.Local market for any raw material, 4.Electronic Retailers for electronic components, 5.Leather manufacturers for manufacturing the band.

4.4. Key Activities:

1) Creation of an efficient supply chain to drive down the cost of our product and increase product supplies.

2) Making proper distributor channels to reach our customers.

3) Managing websites, effective management and delivery of online orders and distribution.

4) Innovative Marketing and sales, Promotions.

5) Understanding customers, influencers, motivations, problems, competitors.

4.5. Customer Segments:

Who are our most important customers and for whom are we creating value?

1) Aged People

2) People who stay alone in home

3) Mentally retarded people with existing medical conditions

4) People with multiple health issues occurring frequently

5) People living in remote areas not accessible to proper medical facilities. 6) Small children who cannot express themselves properly.

4.6. Distribution channels:

1) Advertisements (Newspapers, Local magazines, posters, pamphlets, etc.)

2) Promoting on social media (Facebook, Instagram, LinkedIn) will be a very important too for our product

3) Marketing along with advertisements

4) Online selling(Online marketing) will help to reach our customers.

5) Retailer shops at a larger stage of our business.

6) Door to door sales especially for those with medical conditions and old aged people.

4.7. Customer relationships:

What type of relationships does each of our customer segments expect us to establish and maintain with them?

1) Personal assistance to each and every customer to explain our product and it's working.

2) Dedicated personal assistance(Assigning a customer representative to specific customers especially for old aged people.

3) After sale service(Warranty, extended warranty, exchange offers and other after sale services as per the consumer's needs.)

4) Co-creation

5) Live 24/7 Customer support

6) Online support forum available for our customers.

4.8. Cost structure:

Initially the company is going to manufacture 10 Bands. Each band will cost Rs 5000 Total cost of 10 Bands=10 x 5000= Rs 50,000

Cost of raw materials= Rs 30,000

Cost of assembling and human labour= Rs 10,000 Total expenditure= Rs (30,000+10,000)= Rs 40,000

4.9 Revenue streams:

Table -1:

FUNDINGS	EXPENSES	INCOME	BOOTSTRAPPING	PROFIT
Electronic/IT companies= Rs.10,000x2 = Rs.20,000 Leather Manufacturing Companies= Rs.10,000x2 = Rs.20,000	Cost of raw materials= Rs. 30,000 Cost of assembling and human labour= Rs. 10,000 Total Expenses(CP) = Rs.40,000	Price per band= Rs.5000 Income(Price of 10 bands= Rs.50,000)	Rs. 20,000	Profit= SP-CP= Rs. (50,000-40 000)= Rs. 10,000

4.10. Value Proposition:

The silent and unnecessary death of many elderly and morbid patients that are occurring with the unavailability of caretakers and regular check-ups leads to many unwanted and preventable deaths.

This problem gives birth to a gadget with a sensor on the under surface which regularly monitors the Blood Sugar, Pulse, Blood pressure, Body Temperature and ECG and automatically compares with the data of the normal patient fed in it. If there are any variations/fluctuations in these 5 parameters, an alarm will be generated which is sent to the saved contacts. This timely alarm will save lives and prevent deaths.

Our gadget shares the following Unique Selling Propositions(USPs):

-The gadget is cost-effective, can be handled and operated easily with service at your doorstep.

-Compared to other devices/Gadgets it is quite effective and efficient since it can monitor 5 different parameters simultaneously and can immediately send information in case of an emergency.

WE STAND BY OUR MOTO “TO PROVIDE YOU AND YOUR LOVED ONES THE BEST YOU DESERVE”

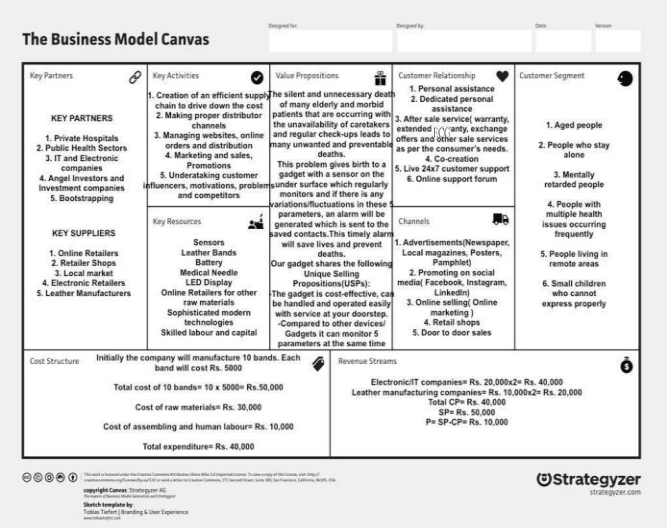


Fig. -1: Business Model Canvas

5. SURVEY RESULTS:

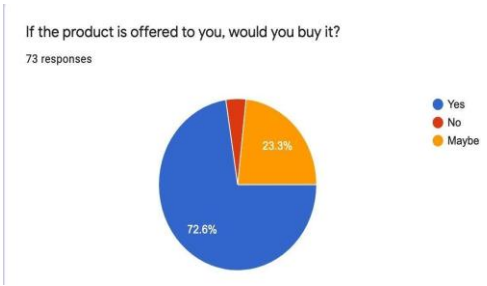
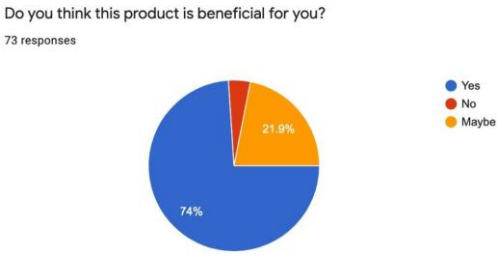


Fig. -2



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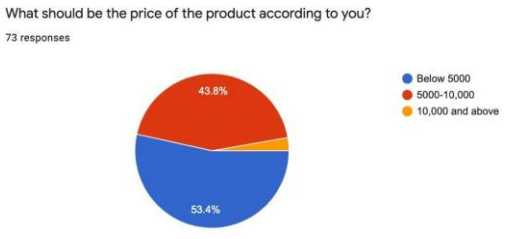

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Fig. -5

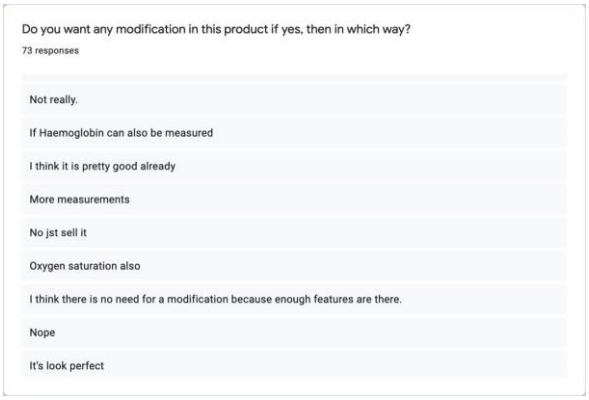
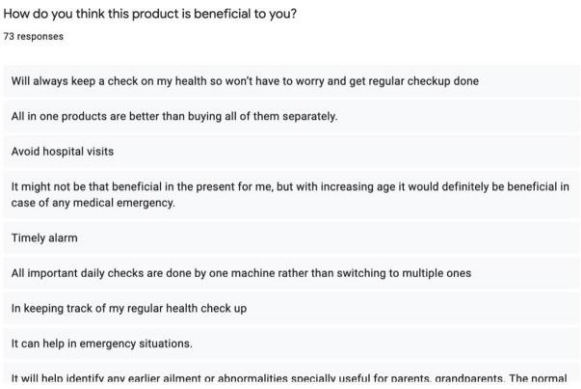


Fig. -6



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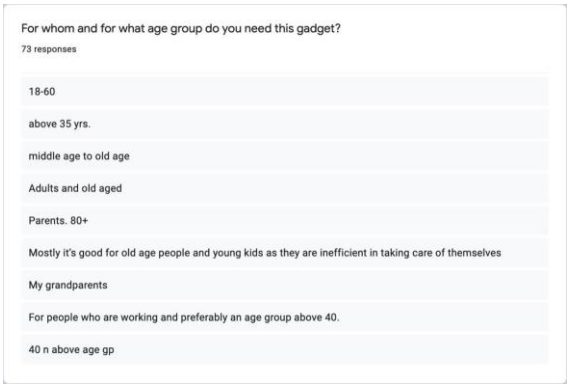

Fig. -8

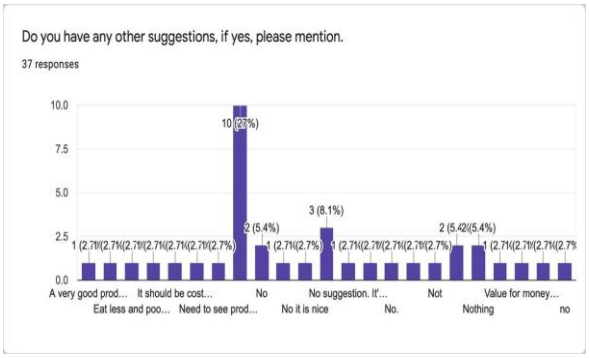

Fig. -9

6. OBJECTIVES:

"The main objective is to eradicate untimely and preventable deaths which occur due to insufficient and untimely health access" The gadget always keeps a check on the health of the patient, who is wearing the gadget thus they don't have to worry about regular check ups to be done. Most importantly, one gadget performs all the important daily checks rather than switching to multiple ones, therefore home management of these 5 parameters is made easy with the help of this 5 in 1 gadget. In future we see ourselves to be good social entrepreneurs serving the society at large so that they can keep a track of their health and avoid their visit to hospital. Our ultimate long range goal is to save lives of people who have frequent health issues by making it easy for them, save their time and resources and keep a track of their health.

7. MISSION STATEMENT:

From the beginning, Our mission is to build the best product and to provide modern and easily accessible health benefits at home at a very subsidised and affordable rate. We consider it our privilege to help elderly people, people who stay alone and people who have frequent health issues. As technology continues to evolve our commitment will always be the same.

8. CONCLUSION:

Therefore, the main aim of our company is that we provide the best product with high quality at affordable prices to eradicate the morbidities and mortalities of the people. With the help of this gadget any individual can monitor the 5 parameters namely: ECG, Blood sugar, Blood pressure, Body temperature, Pulse rate, at home only which will prevent them from visiting hospitals, considering the present scenario. The design of the gadget will be in the form of a band with sensors on the underlying surface as discussed before. We created a website which shows the prototype of our gadget, along with the technology used and our approach. The survey results show the need of the people to buy such a gadget and the demand of our product from the economic perspective which will help us in achieving our sales.

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