SMART JEWELLERY OR CLOTHING

A Smart & Automatic Electronic Defibrillator Vest

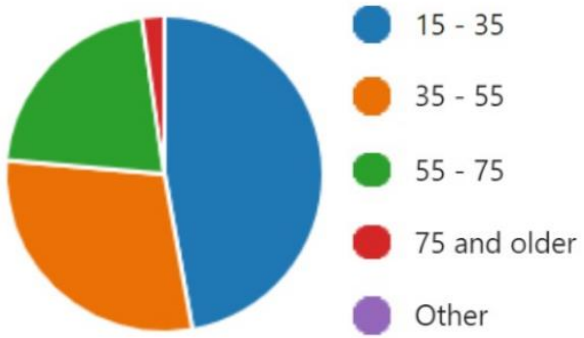
Presented by: Team 13
Priyanka Deokar,
Sukhada Patil,
Vaishnavi P.

With the guidance of:
Himalaya Pramanick,
Sonu Gill.

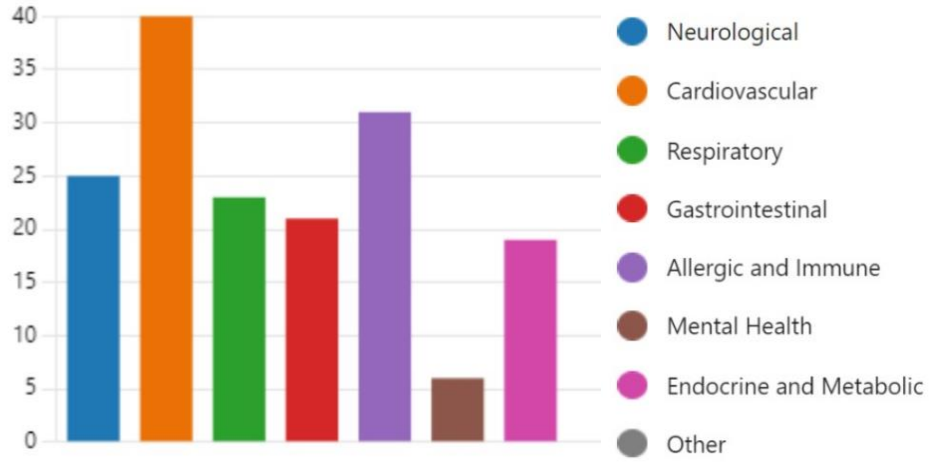
EMPATHIZE.

OUR FOCUS: SAVING LIVES.

- Interaction with people.
- Insights from medical experts.
- Inputs from patients & relatives.

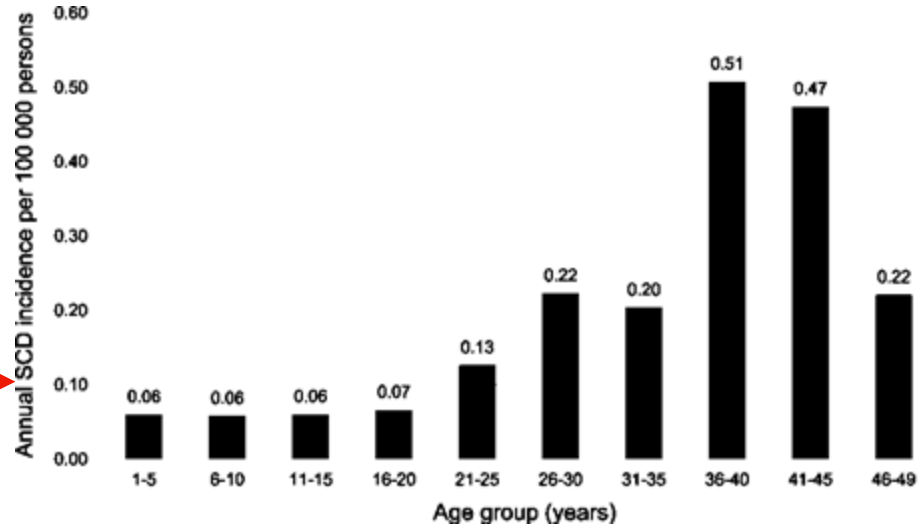


Age of survey responders.



Health conditions of survey responders

"In the emergency ward, most cases nowadays are due to sudden cardiac arrests"
-Dr. Ramesh Babu



Age group of annual SCD cases

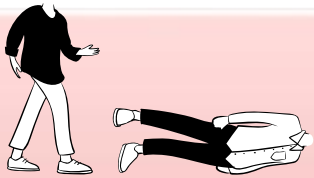
DEFINE.

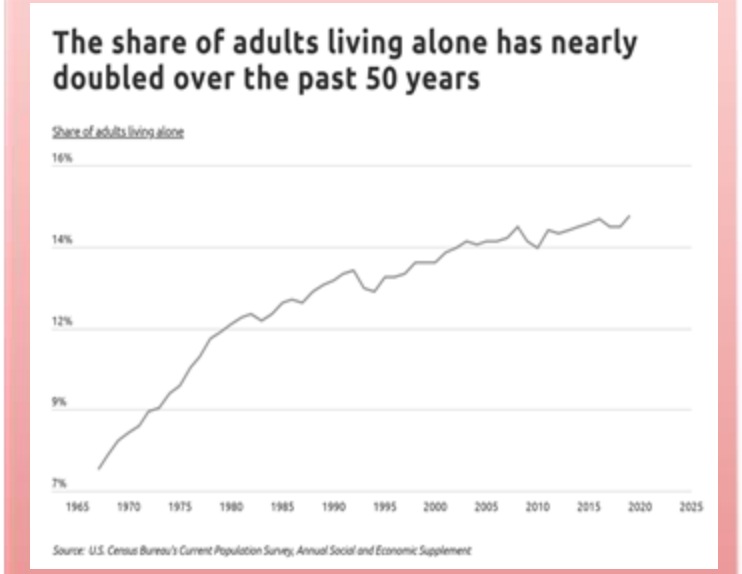
We learnt that a great concern among people of all age groups was particularly the risk of **cardiac arrests**, for people living **alone.**

OUR FOCUS: CARDIOVASCULAR ISSUES.

Need to be quick.

AEDs are immobile and difficult to use.



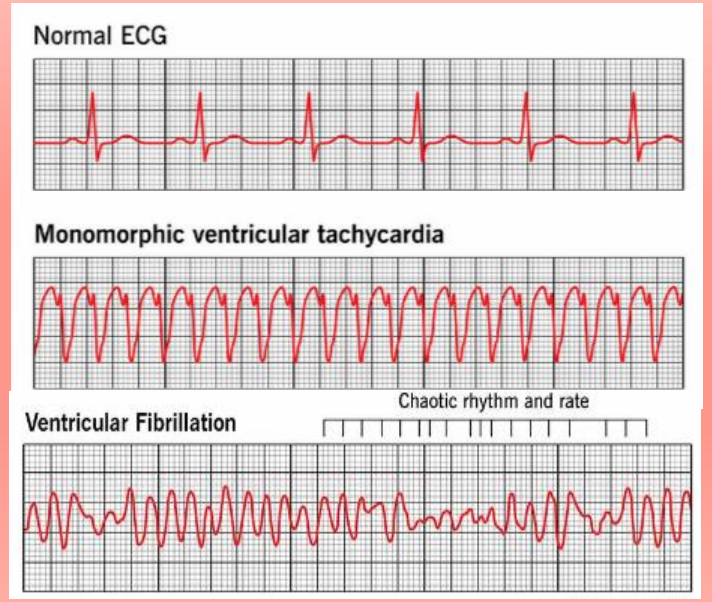


Need for rescuer.

IDEATE.

OUR FOCUS: COMPACT, PORTABLE & EASY.

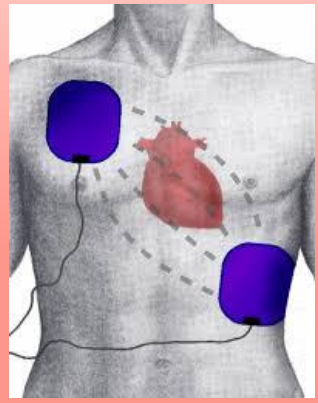
Continuous ECG monitoring.



Compact and wearable.

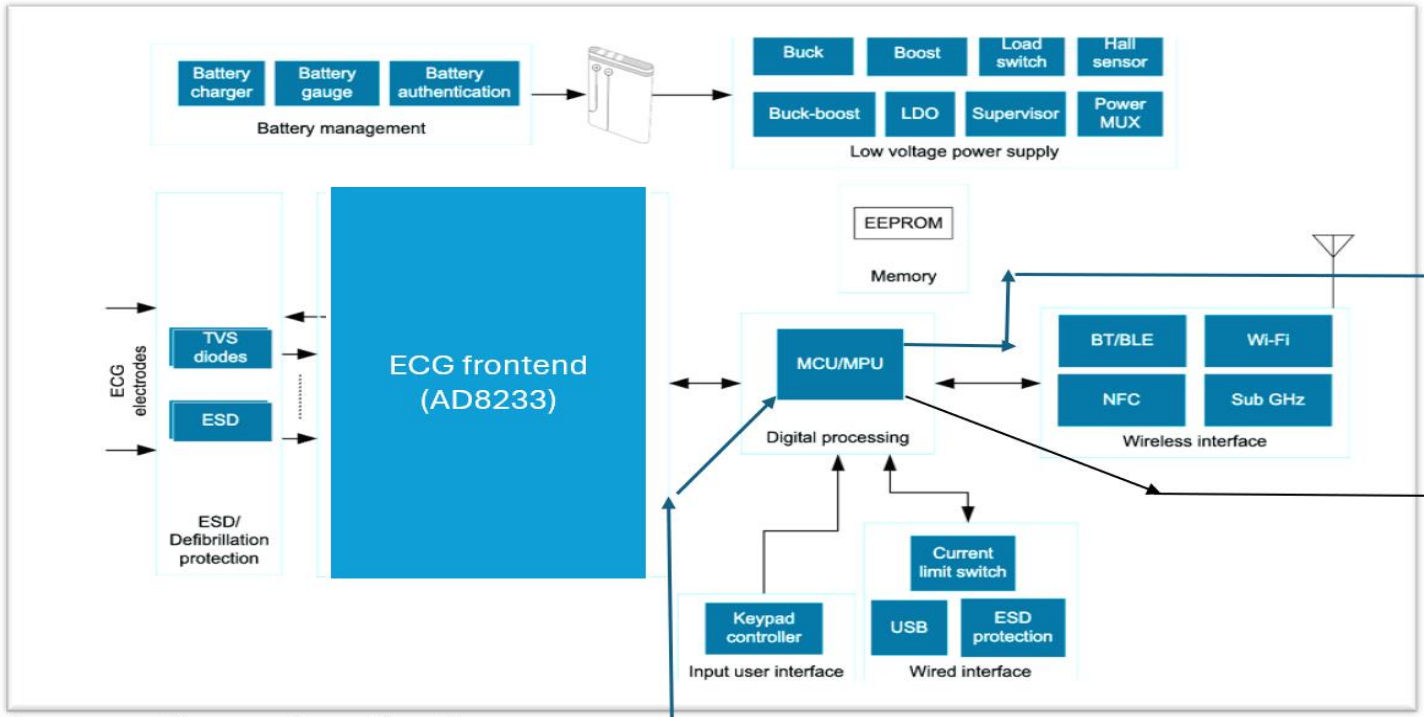
- Waterproof
- Should fit different body types
  - Dr. Mohammed (MD Cardiology)

Automatic Defibrillation.

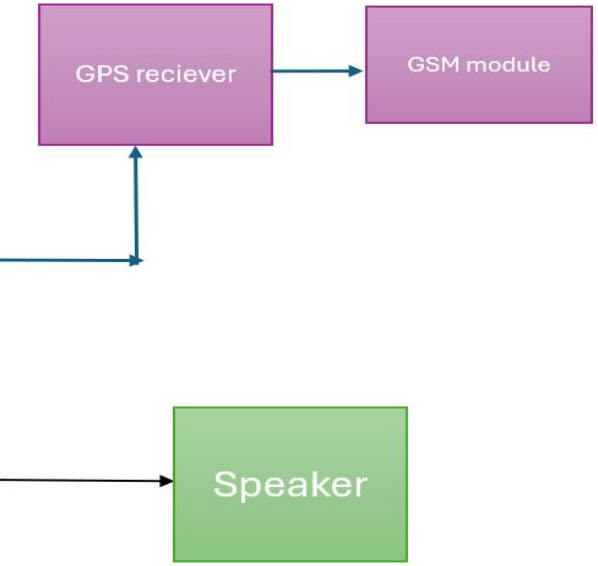


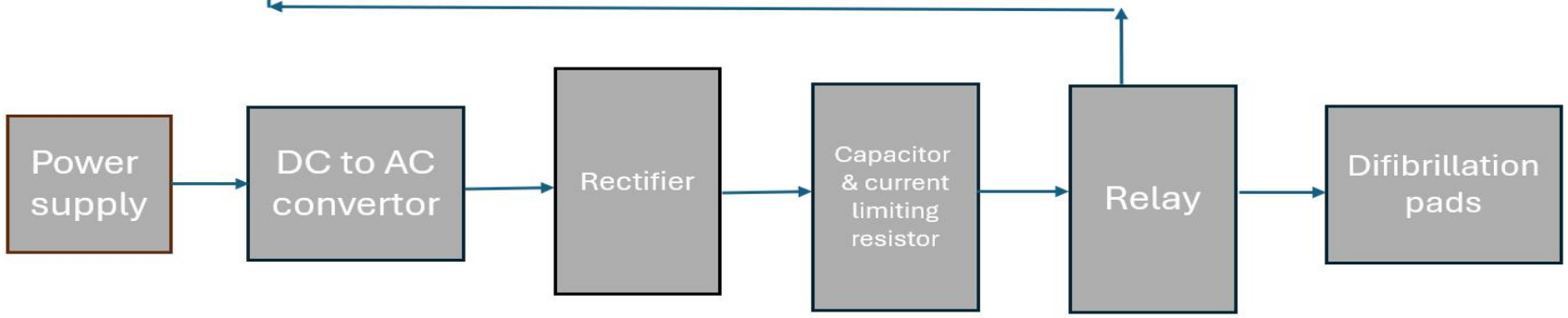
- Fast & accurate response.
- Sends location details to family and medical services.

PROTOTYPE.



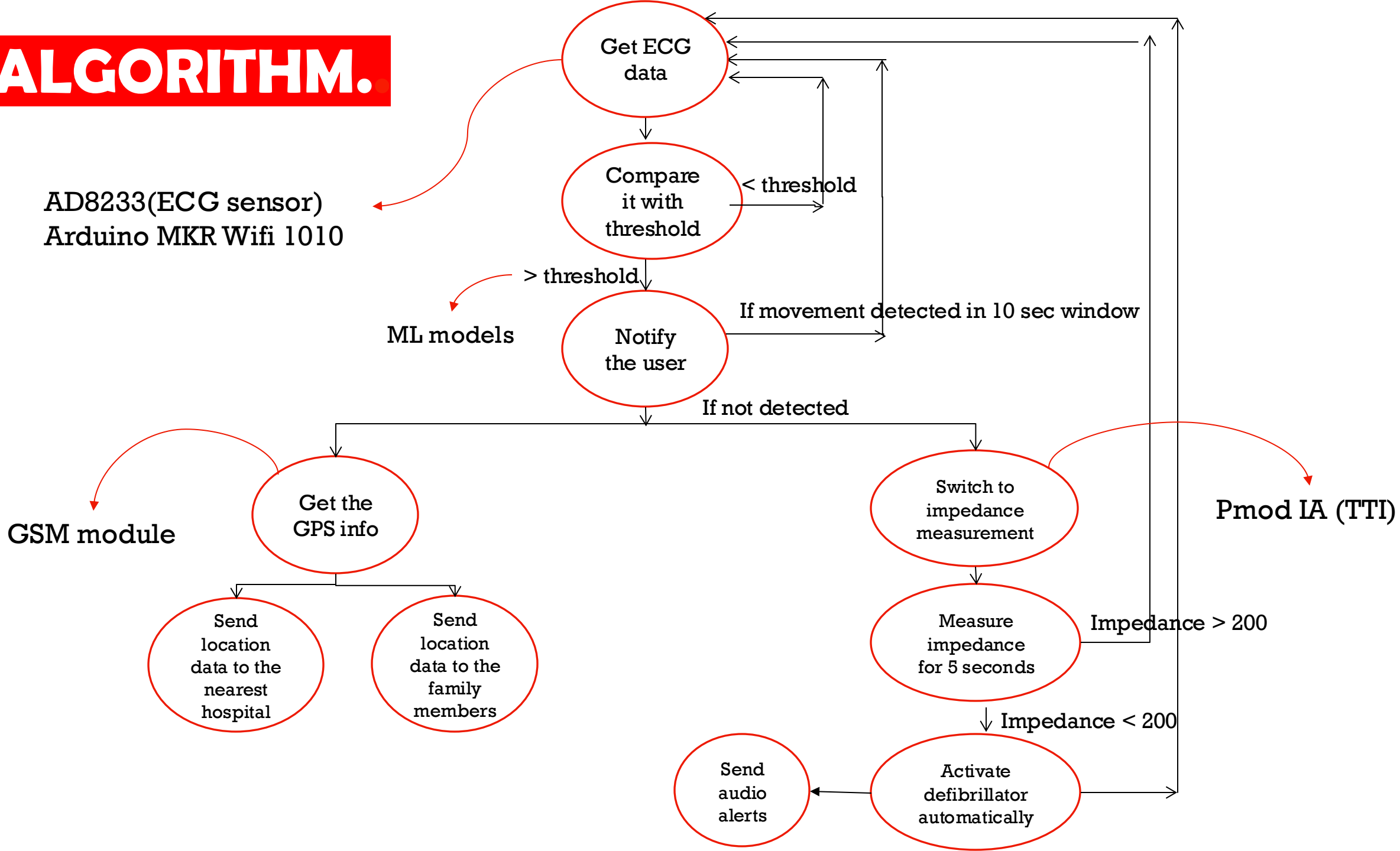
Source: ti.com/applications





Estimated manufacturing price: ₹ 27,500 to ₹ 37,500

ALGORITHM.

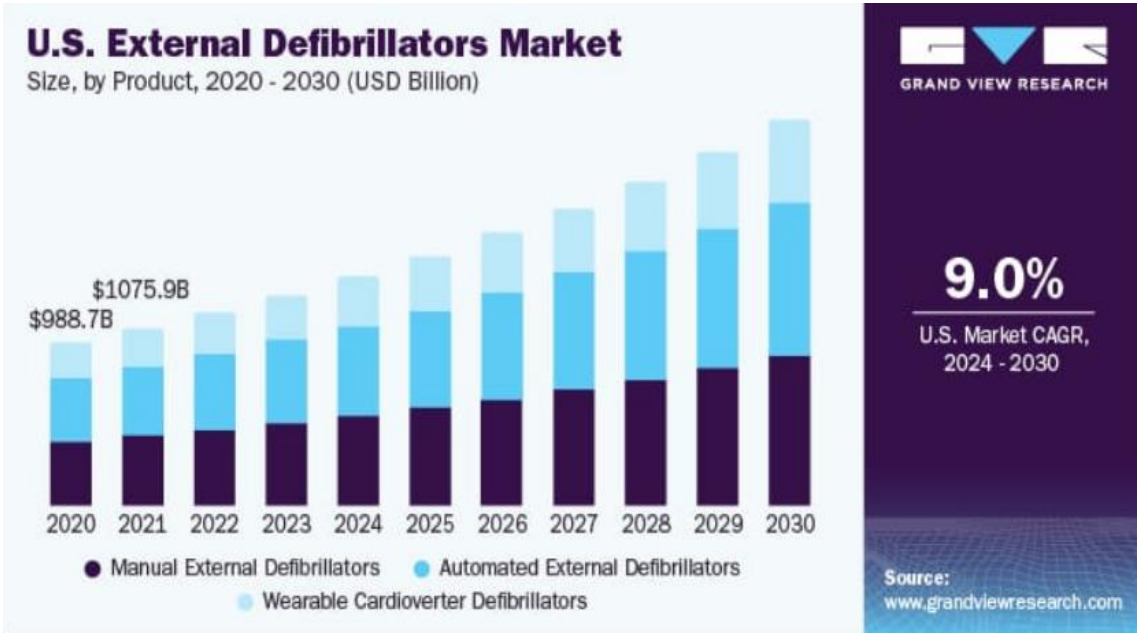

Get ECG data
AD8233(ECG sensor)
Arduino MKR Wifi 1010
Compare it with threshold
< threshold
> threshold
ML models
Notify the user
If movement detected in 10 sec window
If not detected
GSM module
Get the GPS info
Send location data to the nearest hospital
Send location data to the family members
Switch to impedance measurement
Pmod IA (TTI)
Measure impedance for 5 seconds
Impedance > 200
Impedance < 200
Send audio alerts
Activate defibrillator automatically

TEST.

OUR FOCUS: FEEDBACK & IMPROVEMENT.

Prototype Testing	Electrical	Waterproof & environment
Clinical Trials	Effectiveness.	Safety & medical standards
Documentation.	NIH or FDA requirements	Submission & Approval.

Customer Feedback



THANK YOU!

PmodIA	2000	
Defib pads	2000	
ECG patch	500	
GSM mod	700	
MC	4000	
other	2000	
battery	1500	
Neo-prene	2000	
additional	5000	
TOTAL	25700	

Alivecor Kardia Mobile

CellAED

+10,000

Total cost

Impedance (Ω)	30-50	51-70	71-90	91-110	111-130	131-150	151-180	180-200
First shock energy (J)	100	150	150	150	200	200	300	300
Pulse duration	10ms	10ms	15 ms	15ms	15ms	20ms	20ms	20ms
First shock voltage	1600V	1950V	1950V	1950V	2300V	2300V	2800V	2900V
Tau max	4ms	5.6ms	7.2ms	8.8ms	10ms	12ms	14ms	16ms
% of energy not delivered	±9%	±15%	±13%	±15%	±25%	±20%	±28%	±30%
Adjusted voltage	1650V	2100V	2000V	2400V	2500V	2500V	3000V	3000V

Table 1: Pulse characteristics for different TTI range

Battery management:

- Good batteries, Li-ion batteries
- Sleep mode
- Power management ICs
- Voltage regulators
- Find total current drawn by each element in active and sleep.
- Runtime = 4200mAh /total current.
- ECG module 200 hrs, active runtime of AED- 30 mins, passive- 2 years