

SleepSafe

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THE PROBLEM

- Sleeping disordered breathing (SDB) affects around 7 percent of the total population, or *490 million people*.
- In most cases this can be *fatal*.
- Traditionally, the diagnosis of these issues is performed in a laboratory where people are connected to numerous sensors and monitored overnight (PSG).
- This process can be a *hassle* and be *uncomfortable*.
- This means that it is difficult to get an early diagnosis of these issues since people only go for intensive monitoring once *severe* symptoms show, and need to spend *heavily* for the diagnosing service.

THE SOLUTION

SleepSafe - Understand *your* health situation *better* from the comfort of *your home*.

- SleepSafe records breathing audio and motion during sleep and analyzes them to give you a better idea of whether to approach involved healthcare systems early on.
- A *wearable* device that clips on to your chest while you sleep records your breathing and chest motion and then detects potential sleeping disorders using a machine learning algorithm and an easy-to-use interface to access your results.
- With my solution, those most prone to these issues (genetics and old age) can avoid complex diagnosis too late in the game. Simply wear the product everyday to get an insight into potential problems (if any) early on.
- The solution is *non-invasive*, *low-cost* and allows for an *automated* diagnosis of sleep apnea and respiratory diseases through the development of a multi-layer machine learning model. The remote monitoring also *saves cost* in visiting the doctor repeatedly.

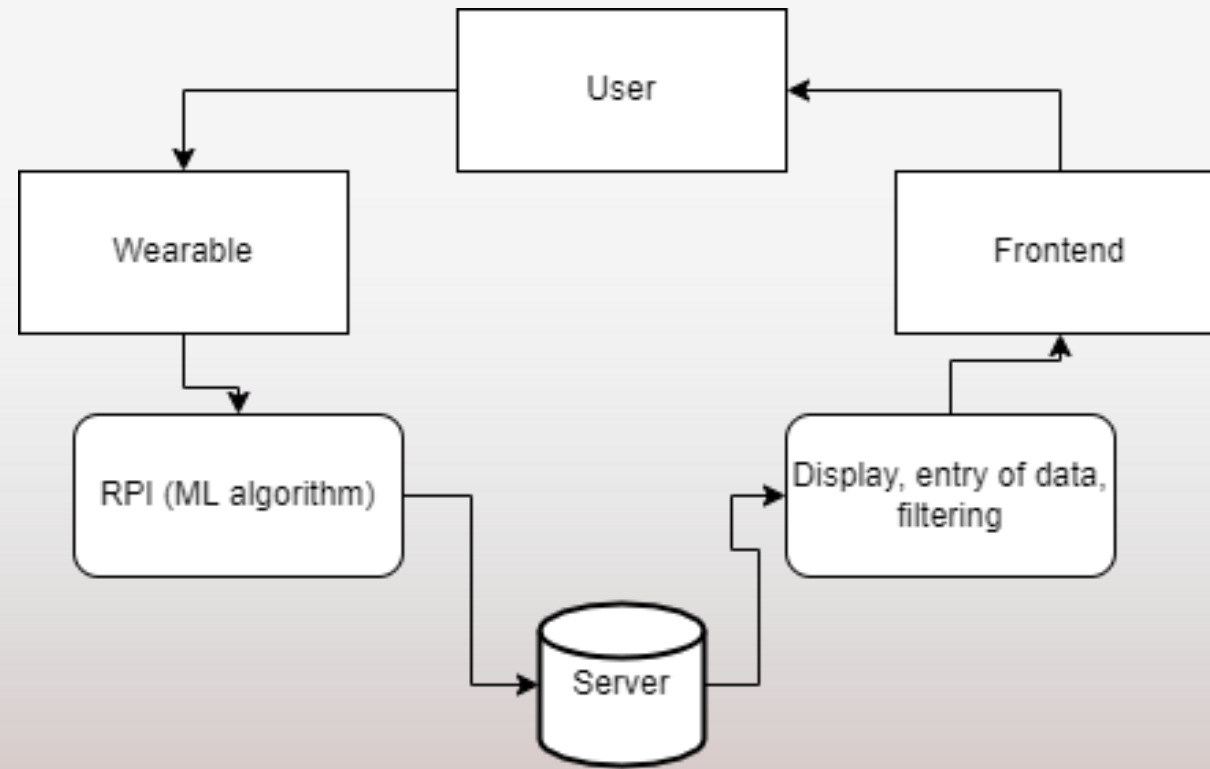
TARGET AUDIENCE

- Primary Audience - those to which hospital service and healthcare services are not accessible, either due to financial or other reasons.
- Those who are prone to sleep related issues due to genetics or other factors.
- Anyone! Anyone who wants to catch breathing issues early on (especially with increase in cases like pneumonia due to COVID recently) can use my product.

THE PLAN

SleepSafe offers a comprehensive hardware and software solution that involves: (a) development of a low-cost wearable to obtain respiratory sounds and transmit them to a device (b) subsequent assessment of the patient's respiratory illness, via development of a multi-model machine learning algorithm. The frontend would be created using ReactJS and will allow for a seamless experience.

SOLUTION DIAGRAM



OVER 90% CHEAPER

PSG polysomnography experience at a hospital costs: 15000 Rs - 20000 Rs

Our product with off the shelf products costs 1500 Rs as of now.

With optimization, expected production costs could go as low as 600 Rs.

FUTURE POTENTIAL

- With more resources, we can create better embedded systems. Create our own custom hardware for this purpose to reduce form factor and cost.
- Can currently diagnose 8 different sleep breathing issues. With addition of sensors this can be expanded to more, and perhaps diagnose heart related issues too.
- Partner with clinics so that the solution can be expanded to help already diagnosed patients at the early stage be monitored without compromising their activities as much, and the device can alert health authorities after an extended period of non-responsiveness during sleep.
- Could become the ultimate health-monitoring system for every household.