

Problem Statement Paper

Background

My idea for this project came from a common issue that some people face: waking up to a loud alarm clock, which can affect others sleeping. I envision the end users or customers being those sleeping in rooms with another person or multiple people, those under this kind of situation are typically college roommates or people who sleep together in the same room. Other potential customers include those that would prefer a less noisy way of waking up. Fixing this issue will ensure that only those who need to be woken up, will, and could also lead to a smoother wake-up process. Those who have a stake in this project are the potential customers, myself, and maybe even entrepreneurs who would be interested in such a product. I would like the final result to be a physical product, that could be patentable. If the final product does not follow through or work out, I would be fine with settling on a prototype.

Functional Description

The main operation of this device will be in two parts, a software application on a remote device and the actual alarm device. The alarm will be a rechargeable in-ear device that stays with you while you sleep, while the alarm is set with the software application. When the alarm time is reached, a signal sent from the remote device to the alarm and alarm goes off. I want the alarm itself to be a buzz, but through the design process other alarm type settings may be used; some research will be done on sleep and waking up methods, so this aspect of it is subject to change. The alarm will shut off automatically. After about a week or two, the device will need to be recharged. Overall, the software application takes an input, the alarm time, or an alarm type in addition, then outputs a command to send a signal out to the ear device. The input of the in-ear device will be the signal from the remote device, while the output is the alarm itself.

This device in itself will be incredibly portable, but operates at a short-range, within 10 meters, and at room temperature with with a range of about 5°C. The target price for this device is about 5-10\$, but hopefully less than that, with a shelf-life of about a year, or more depending on the battery life and quality.

Deliverables

When this project is complete, I would like to have the earplug device, or the circuit representing it. A recharging station for the device, if that becomes feasible in the design process. Lastly, the software and hardware that will interact with the earplug device, an application that works on smartphones containing either iOS or Android as an operating system. These deliverables should work in tandem with each other as expected.