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Problem

A lack of awareness about the long-term implications of noise exposure
15% of Americans between the ages of 20 and 69 experience hearing loss that may have been caused by noise at work or during leisure activities.

Studies on the health consequences of noise have indicated that noise *elevates heart rate, blood pressure, vasoconstriction,* and *stress hormone levels.*
Meditation produces long-lasting changes in brain activity.

Areas involved in attention, working memory, learning, and conscious perception are improved.
Noise exposure is cumulative; Awareness is key.
Contextual Inquiry
Moderately noisy work environment
Lacks control of his noise exposure

Dartmouth student who is exposed to noisy social environments multiple days per week
Has control over exposure levels
Takeaways

Users *don’t want an external device* that would inhibit normal work tasks.

Generally aware of risks, *unaware of implications*.

Varying *levels of control* over exposure.

Interested in understanding *patterns of exposure* and knowing implications.
Tasks
Measure and Record

Measure noise level at **frequent** and **regular** intervals throughout the day.
Display Current “Soundscape”

Display the current noise level and report safe exposure time.
Display Data Over Time

Display noise exposure data over an extended timescale (day/month/year). Indicate patterns in behavior.
Adapt Behavior

Make effort to **minimize risky exposure** and maximize “zen time”.
Integrate crowd-sourced data

Gain *environmental awareness* using data from user base.
Analysis + Implications

Analyze noise data and communicate the long-term effects of exposure.
Designs
Design #1

- Small Dynamic Adaptive Microphone that measures dB levels
- Microprocessor that calculates + limits dB levels
- Ear volume
- Environment volume
- Standard 3.5 mm input jack
Design #2:

- Notification
  - warning: > 80 dB
  - swipe to learn more
    - show more related info on screen

- Statistics
  - 24 hr / 1 week / 1 month
  - IQ/DB
  - quietest day
  - worst day
  - rotate to see more

- Map
  - select time
  - show noise exposure levels in heated map
Design #3

Diagram showing a user interface with various elements labeled:
- "Currently Tracking Icon"
- Location Average
- Current Time Average
- Timeline Overview of Past 24 hrs
- Current progress
- Comparable Volume
- Warning Level Indicator

Details include:
- 10:04
- 105
- 82
- 112.4 dB
- 10:02
- 113 dB

Icons for:
- Log
- Add Note
- Info
- Settings
Storyboards
Tracking Zen

1. Jimmy goes through his day while passively recording the sound of his environments.

2. At the end of the day, he checks the data he's gathered and sees he needs to have more "zen" in his day.

3. Jimmy makes some adjustments the next day in his routine to lessen the amount of noise he encounters.

4. He is happy to see that his efforts to reduce the noise in his environment have paid off!
Exposure Analysis

- Day
- Week
- Month
- Year

2hr
1hr

- Time > 100 dBs
- Time < 50 dBs

MT W TH F S SU

85 min
avg/day

53 min
avg/day

85 min
avg/day

Great job finding some zen time everyday!

Incorporating more quiet moments into your daily life can reduce stress and increase focus—keep it up!
Questions?