

CapLace

Team 5, hgZoom

Executive Summary

CapLace creates a safe online space for minors by transforming unconscious media consumption into self-regulated engagement through private biometric data analysis.

Background and Motivation

Several team members have experienced firsthand the frustration of being told to reduce their screentime from their parents without having the means to control themselves. However, we also understand our vulnerability as teenagers and how our relationship with social media can have severe effects on our mental health. Today, over **95%**⁽¹⁾ of teenagers own or have access to a smartphone, of which **52%**⁽²⁾ report wanting to reduce their screentime. Yet engagement-driven social media platforms encourage passive consumption, creating **risks of addiction** or **habitually reinforced stress** that has lasting impacts on young users. Current online safety measures fail as age restrictions are easily bypassed, while parental monitoring can destroy privacy, cut minors off from the internet's benefits, and strain family trust. These limitations highlight a growing need for a new approach that empowers the youth to **build healthier, self-controlled relationships** with technology.

Product Description

CapLace is a biometric necklace that helps teenagers recognize and manage the hidden psychological effects of social media use. Using **photoplethysmography (PPG)** and **electrodermal activity (EDA)**⁽³⁾ sensors, it measures **heart rate variability (HRV)** and **physiological arousal** during cellphone usage to classify four primary psychological states according to the **Circumplex Model of Affect**⁽⁴⁾: **High-Stress Panic, Hyper-Aroused Stimulation, Calm Flow**, and **Apathetic Deactivation**. A **Wideband Linear Resonant Actuator (LRA)**⁽⁵⁾ embedded within the pendant delivers subtle state-specific frequencies to gently alert and calm potentially unhealthy emotional shifts. This necklace is paired with a **mobile app** that combines biometric data with a screen activity analysis program to reveal how certain platforms and content categories affect a user's emotional state. The app provides weekly insights where patterns such as content preferences and potential desensitization from exposure to harmful content are suggested, encouraging greater self-awareness through private notifications. Furthermore, CapLace shifts online safety from filtrations and restrictions to preserving individual freedom. Operating entirely within the user's device, CapLace does not block content or report logs to third parties; instead, it encourages **adolescents to recognize and manage** stress themselves. By transforming passive media consumption into conscious choices, CapLace empowers teenagers to **build healthier and independent relationships with social media while preserving privacy and the benefits of them**.

Target Audience/Market

Although CapLace is designed for teenagers, particularly high school students, our primary target market is social-media-active **millennial parents** who are invested in their child's digital well-being. Parents can preserve trust and healthy communication with their children, while teenagers are empowered to build healthier and more intentional relationships with the internet. We plan to conduct our field testing and initial product launch in 2030 in Tokyo, utilizing the city's influential youth subcultures to transform CapLace into a fashion trend capable of generating global virality and accelerating early brand adoption.

Financial Analysis

The production cost of CapLace is only **\$31.79**, while its retail price is set at \$80. We have optimised the profit margin (**60%**) of CapLace so that there is an optimum balance between the **quality** of our technology and the **affordability** of our products. Furthermore, we are expecting the net profit margin to be **48%** in year 1. We project our revenue to be **\$21.6 million** at year 10, as we expand our market to the world.

Competitor Analysis

While similar wearable technologies can track general stress levels or help calm the nervous system, CapLace is the only device capable of combining bodily stress signals with screen usage. Moreover, by helping users recognize patterns in their emotional responses to online content, CapLace develops **long-term skills** in conscious media consumption and self-reflection, enabling **healthier digital habits** that persist even beyond use of the device.

1. Anderson, Monica, et al. "How Teens and Parents Approach Screen Time." Pew Research Center, 11 Mar. 2024, <https://www.pewresearch.org/internet/2024/03/11/how-teens-and-parents-approach-screen-time/>
2. Jiang, Jingjing. "How Teens and Parents Navigate Screen Time and Device Distractions." Pew Research Center, 22 Aug. 2018, <https://www.pewresearch.org/internet/2018/08/22/how-teens-and-parents-navigate-screen-time-and-device-distractions/>
3. Schmidt, Philip, et al. "Introducing WESAD: A Multimodal Dataset for Wearable Stress and Affect Detection." Proceedings of the 20th ACM International Conference on Multimodal Interaction, 2018, pp. 400–408. https://ubi29.informatik.uni-siegen.de/usi/pdf/ubi_icmi2018.pdf
4. Posner, Jonathan et al. "The circumplex model of affect: an integrative approach to affective neuroscience, cognitive development, and psychopathology." Development and psychopathology, vol. 17, no.3 (2005): 715-34. doi:10.1017/S0954579405050340
5. He S, et al. "Affective Stroking: Design Thermal Mid-Air Tactile for Assisting People in Stress Regulation", vol. 14, no. 20, 2024. <https://doi.org/10.3390/app14209494>

