

HealthDash

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Prototype Link: [Prototype Demo](#)

I. Introduction

HealthDash is a design fiction project related to sensing and tracking technologies inspired by the continued evolution of wearable technologies. This design fiction aimed to explore the following question, “What could a world look like if humans could have on-demand overview of our most important bio-metrics?” I explored the answer to this question in the form of a conceptual software health dashboard called HealthDash.

HealthDash is an application where people can access important and interesting information regarding their biometrics. The software provides biometric information in the following areas: cardiovascular, respiratory, mental health, and bodily injury. This fiction involved designing an interface that displays information in these key areas as well as develop a prototype to show the user-experience and interaction design.

For this design fiction, I designed a dashboard software experience to show informative metrics about an individual’s health. Some key areas I focused on were vitals, injury, and physical information. I wanted to posit a world where all metrics in these areas could be known in near real-time by way of any acceptable biosensor.

II. HealthDash Prototype

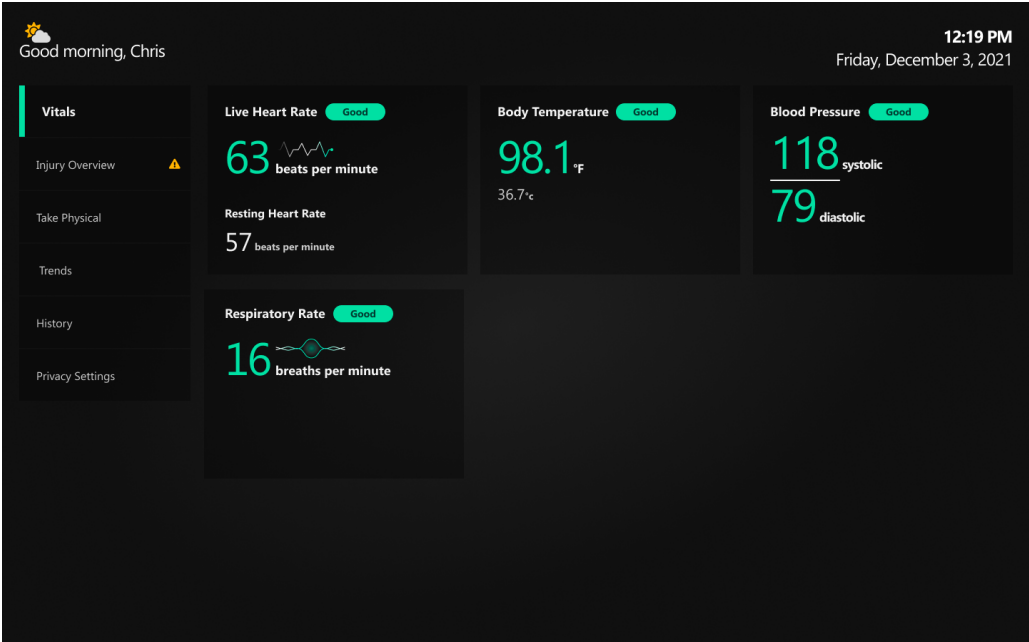


Figure 1 - Vitals Dashboard

Vitals

Using design software Figma, I designed a dashboard software experience to show informative metrics about an individual's health. The U.S. Department of Health and Human Services defines vital signs as reflecting essential bodily functions, such as blood pressure, respiratory rate, heart rate, and temperature. I wanted to create an experience where a user could check in on their vital signs at any time and see real-time updates on these vital signs.

In the design, I created a space for vitals titled Live Heart Rate, Body Temperature, and Blood Pressure, and Respiratory Rate. In this Vitals experience (Figure 1), people could see real-time analysis of their vital functions. Here a person can see their Live Heart Rate, Body Temperature, Blood Pressure, and Respiratory, and see the status of their vital information. In this example, all the metrics are in a good or healthy zone. If any of their vital signs were out of normal range, the label could be changed to any corresponding label that accurately describes their vital state. Perhaps there could be other labels or features that would help a user make an informed decision about a particular vital, potentially even a feature to enable users to contact their doctor if a vital sign is not in a healthy range.

After a user checks the status of their vitals, they can view further information about their personal health by visiting the "Injury Overview" tab on the left-hand side of the interface.

Injury Monitoring

Injury monitoring in HealthDash assumes there exists non-invasive technologies that can track and monitor injuries for users. For the purposes of this design fiction, I created a fictional wearable product that senses and predicts when muscle and tendon injuries may occur. The product is called ProtechWear. ProtechWear (Figure 2) proposes a wearable, such as a knee band or arm band, that can be worn and detect when an injury may occur due to overuse in sport, physical labor, or physical therapy sessions. The goal with the injury sensing device is inform users when an injury may occur, and perhaps even track when an injury has occurred. With this knowledge, a user may be able to push themselves to the extreme limit, and potentially rarely encounter an overuse injury.



Figure 2 - ProtechWear Injury Sensing Knee Band and Watch companion

The HealthDash dashboard can take the ProtechWear information as input and display to the user information about their injury sensing device. In HealthDash, users can synchronize their personal biometric devices via Bluetooth or API to display device data on a single interface. In the interface, I designed an experience called Injury Overview, to display device information like ProtechWear.

The Injury Overview experience (Figure 3) is an area in HealthDash that takes in external device data and displays the data in a way that is engaging and informative. In Figure 3, the screen shows an outline of a body with two ProtechWear devices connected to the system, a knee device and elbow device. The HealthDash Injury Overview section informs users with information about their ProtechWear device. In this example, the user's knee wearable indicates that there are no injuries to be notified of. The elbow/forearm wearable however, indicates that an injury was detected, denoted by a yellow highlight over the elbow/forearm region on the body diagram, as well as a notification in the top right. This user has experienced some form of an elbow sprain and, if they choose, the user can select the region of the body to zoom in and gain a clearer understanding of the injury (Figure 4).

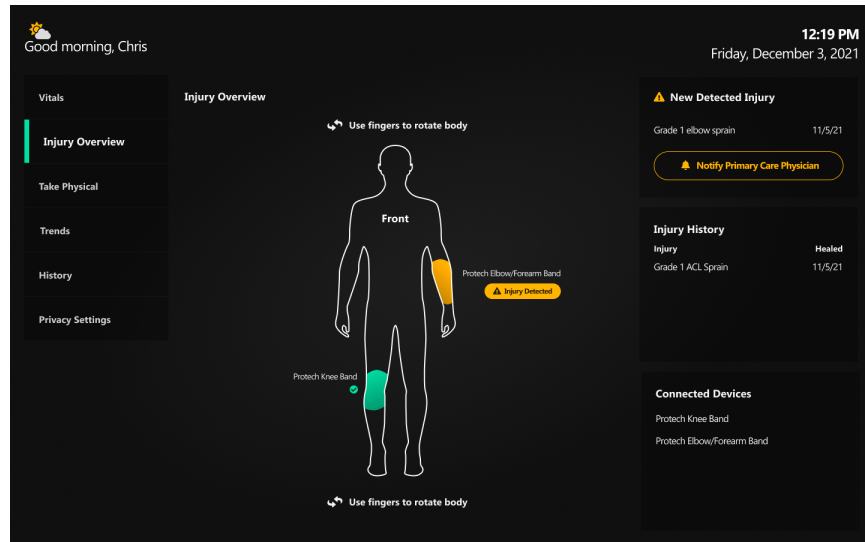


Figure 3 - Injury Overview

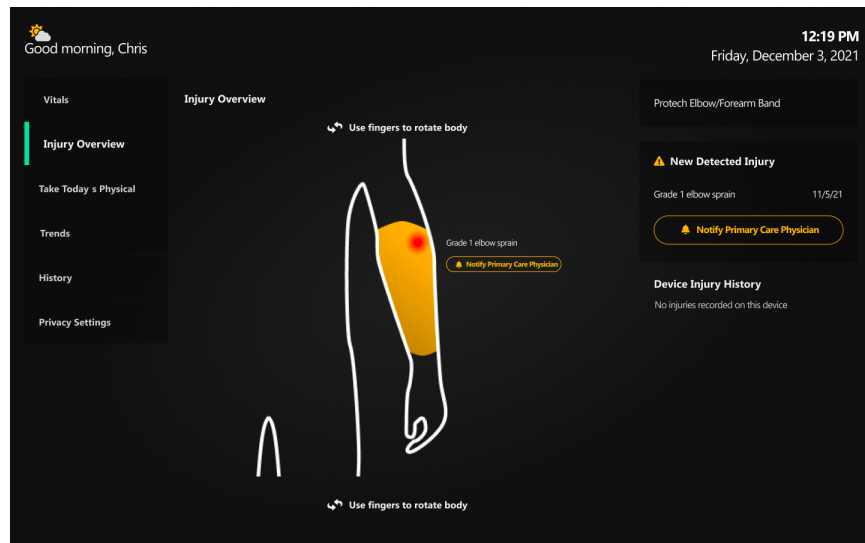


Figure 4 - Injury Overview Zoom

Once zoomed in on the injury region, the user can see where exactly the injury has occurred. In this case, the ProtechWear injury wearable shows a Grade 1 injury has occurred in the elbow region. From here, a user can choose to notify their primary care physician by clicking on the button in the top right “Notify Primary Care Physician”. This would send the information to the user’s physician who could then offer communication on how to best take care of the injury.

All this access to an individual’s personal biometric information has broad implications in the areas of privacy, data ownership, and societal impact. The next section will discuss such implications and provide a framework for how we can approach designing experiences for personal biometrics.

III. Impacts and Discussion

Accessing and designing for personal biometric data is inherently complicated and involves working with many regulatory bodies and privacy advocates. For example, any software created for healthcare services must be HIPAA compliant. HIPAA stands for the Health Insurance Portability and Accountability Act which was passed in 1996. Its overall goal is to encourage the development of health information by establishing standards and requirements for electronic transmission of certain health information, as well as to combat fraud and abuse in health insurance and health care delivery (U.S. Department of Human Health and Services, 1996). Designers and developers of healthcare software need to keep in mind the regulatory bodies and ensure the biometric information displayed to users are accurate and compliant with HIPAA.

With an application like HealthDash and wearables like ProtechWear, it also raises the question of who owns the biometric data. In the HealthDash example, it is conceived to be a software application. In many software application use cases, the data is ultimately owned by the private company that provides the software services. Users often sign a terms and services that allows the private company to use any data a user provides in a way the company sees fit. This is rather common in this day in age where many individuals are willing to trade information in exchange with a service. Is this however the best, and only way? In many cases, users do not fully read through the terms and services of a software agreement and may not have full transparency into how their personal data is owned and used. Does this mean that such health data is better off in the hands of the government, for example the U.S. Department of Health and Human Services?

Private versus public ownership of health data is large debate. There are pros and cons to either side, and ultimately such answers should be left to an individual user to decide. In such cases, however, there seems to be a rift between public and private data ownership. Does there exist a scenario where infrastructure exists, and private and public industries can work in tandem to provide the best health care information and services to the public? This design fiction was designed to ultimately raise the question of ownership of data. Is it possible for the government to know too much about an individual's health? Likewise, is it possible for a private corporation to know too much about an individual's health? Who is the better harbinger of such personal information? These questions require much more in-depth research and exploration.

References

U.S. Department of Human and Health Services, HIPAA 1996, accessed 13 December 2021, <<https://aspe.hhs.gov/reports/health-insurance-portability-accountability-act-1996>>

National Library of Medicine, MedLine Plus, Vital Signs, accessed 12 December 2021, <<https://medlineplus.gov/ency/article/002341.htm>>