08/25/15

UX Design Principles
for Wearables

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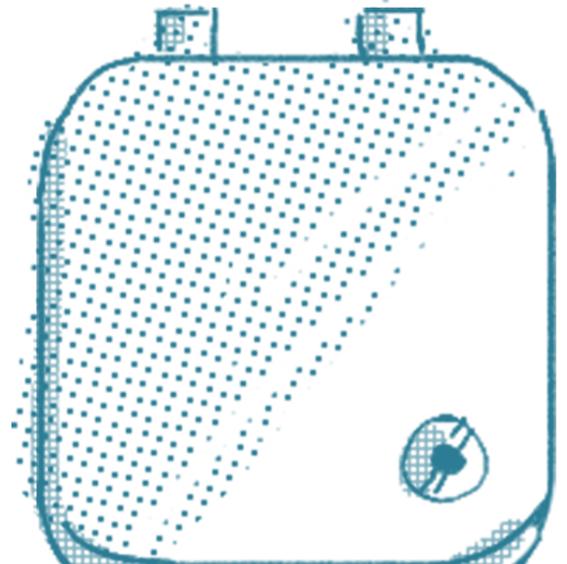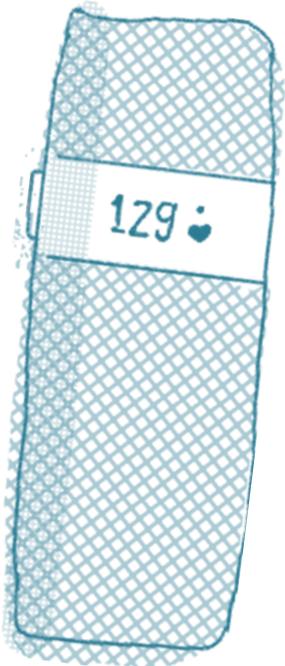
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Overview

How do you design for something that's meant to be worn and displayed, a part of a user's life? Something that, if designed right, becomes a natural extension of one's body? The wearables market has exploded in the past few years, spurring the development of hundreds of new devices providing unique methods of tracking and providing data. We've studied a cross-section of currently available products to identify the key design principles for creating an amazing wearable device.

We focused on three core groups of wearables currently on the market: devices that track and motivate users' activity, devices that promote awareness, and devices that log sleep patterns (see for more on these groups.) In addition to our wearables design principles, you'll find recommendations for designing specifically for each of these groups. Between the design principles and targeted recommendations, we've included insights into designing the physical hardware, creating desirable functionality, and ensuring the entire device is pleasantly easy to use.

Our Focus

We focused on tangible, digital devices worn by users that track one or more pieces of data on their behalf. Wearables in our focus may or may not include physical buttons or displays themselves and are therefore generally supplemented by an application that must be used to consume and manipulate the data tracked.

There are also wearables with extensive digital interfaces themselves, such as a smart watch. While the principles outlined here likely apply to smart watches, these principles are not intended to be comprehensive to those more complex devices and UIs.
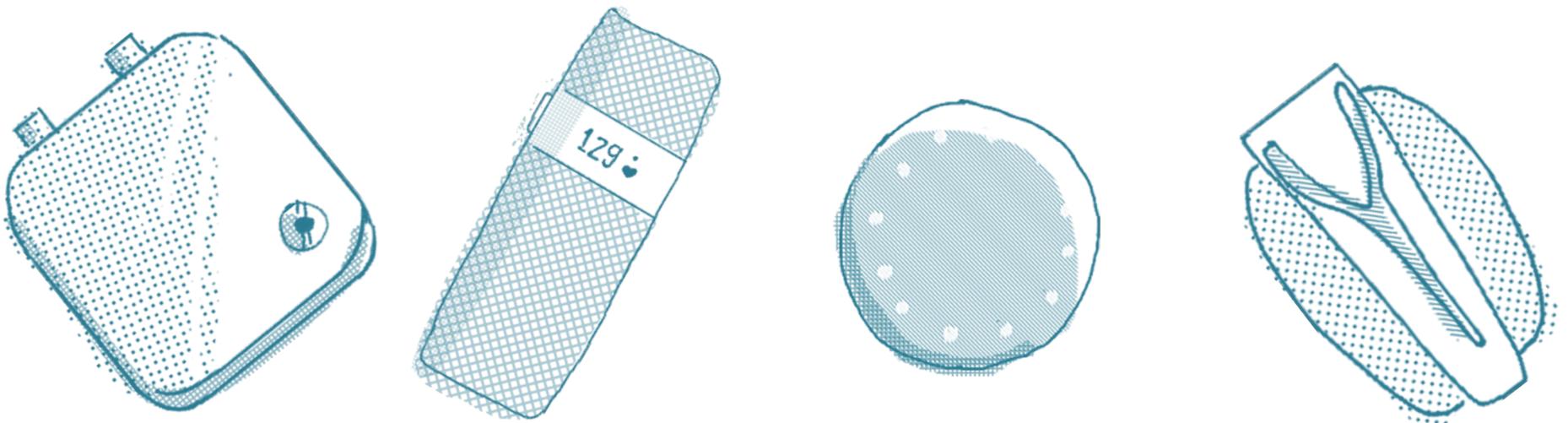
Our Process

Before arriving at any wearable design recommendations, we first needed to analyze wearables currently on the market to see what works and what doesn't. Our team at Fuzzy Math took on this challenge by adopting a wearable and using it for three months — each participant was responsible for utilizing and assessing the experience of one device (see for more on the devices analyzed). We kept notes of our experiences throughout, tracking anything that was enjoyable, difficult, surprising, or otherwise impacting our utilization of the device. This sort of diary study gave us longitudinal insight into how a wearable can (or can't) become part of our lives, from the initial excitement of unboxing a new product to getting acclimated with it and eventually to familiar use or abandonment. We met periodically to discuss our experiences and record, as a group, our expectations, goals, and hopes for our devices moving forward.

At the end of our three-month trial, we reviewed our individual experiences with our devices and pulled out common themes shared across users of different devices. Digging into these shared experiences uncovered the underlying factors that create joy or frustration while using a wearable device, which are reflected in the design principles you see here.

More on our blog

Want to learn more about our research, and how we got to these design principles? Check out our full series for weareables content on our blog at http://blog.fuzzymath.com/category/technology-ux/wearables/

Types of Wearables

As part of our research, we identified three types of wearables that are prominent in the market: devices that track and motivate users' activity, devices that promote awareness, and devices that log sleep patterns. In some cases, devices might offer features across multiple groups (see for more on the devices analyzed).
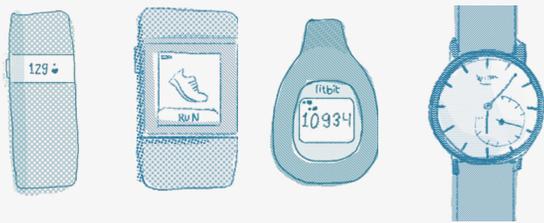

ACTIVITY

All participants of our wearables study—regardless of which group they chose—are active. Most walk or bike to and from work, play recreational sports, work out, or are otherwise out and about. However, the activity group was solely focused on the ability of their wearables to record and alter their performance. From the steps they took to get into the office all the way to the inclines they experienced on their walk home, activity trackers had one thing on their mind: movement. This group integrated social components as a motivation to compete for who would come out to be the most active each week or weekend. In the end, all members of the activity group tracked their movement and tested their personal commitment to action.

AWARENESS

The group called awareness evolved out of a common thread of personal recognition and self awareness. Devices in this group range from tracking stress to capturing experiences visually. The question at hand for the awareness group was, "How can I pro-actively improve my ability to be aware and present in order to prevent issues that might stem from a lack of mindfulness?" Ultimately, the awareness group developed a unique experiment to gauge attention and perception.

SLEEP

The concept of sleep is pretty cut and dry. Surprisingly, that was the assumption of the sleep group when they first formed their troop. Over time, the sleep group has learned that sleep might be the most complicated concept to measure and track, as there is no conscious recollection of the event with which to compare results. Participants in the sleep group used devices overnight to measure the hours they slept and other sleep-related measures (such as restlessness and time awake). Their results have been fascinating.

Design Principles

Want to design an awesome, engaging, easy-to-use wearable? Follow these principle to ensure your device maximizes usability.

1 Data must be accurate and easily understood

2 Ensure privacy is transparent and configurable

3 Clarify the source of the data

4 Use context to drive insight

5 Compensate commitment

6 Encourage through storytelling

7 Personalize without distracting

8 Less obligation, more automation

9 Enhance without distracting

10 Withstand the elements
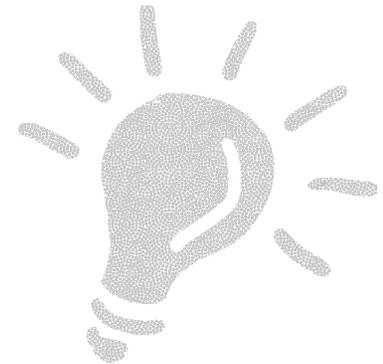
1 Data must be accurate and easily understood

Data is at the core of wearables, and is typically the reason a user will choose to buy a device. As a result, the data collected and any associated outputs are the key value points which will affect user satisfaction with the device. First and foremost, the data must be accurate. Allow users to flag and modify data when they spot inaccuracies, so they're not stuck with data they know to be false. Once you have accurate, trusted data, it needs to be easy to understand. Avoid using complicated jargon; focus instead on friendly, familiar language, and clearly explain important concepts to users throughout the beginning of their journey with the device.
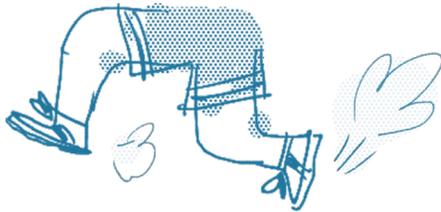
ACTIVITY

Activity wearables should be smart enough to know when you are waving your arm or putting the device on, so as not to track that as activity and skew the data.

AWARENESS

Awareness is a subjective phenomenon. Data should be translated into easily understood metrics that can be easily interpreted and tied to related behaviors and environmental factors by all users.

SLEEP

Sleep is tricky. Take care to differentiate between someone lying down to watch Netflix, someone trying and failing to sleep, and someone deep in dreams.

2 Ensure privacy is transparent and configurable

For any wearable device, and especially ones with active data tracking, ensure that users have a clear understanding of what data is being captured, where it's going, whether or not it's visible to others, and if so, to whom it's visible. Provide easily accessible controls for changing privacy settings to ensure that users can decide what to share, and whom to share with. Consider the intimacy of the data when creating defaults, and wherever questionable, default to greater privacy — it's much easier to share something later than it is to unshare once it's out in the wild. Beyond smart defaults, include guidance on privacy as part of the user onboarding process, ensuring they're not only oriented to the social capabilities of the device but also aware and in control of their data from the very start.
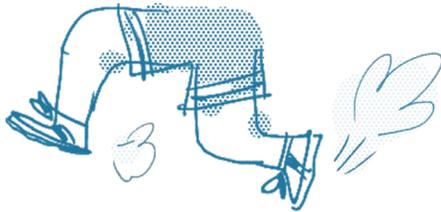
ACTIVITY

Allowing users to share data and compete against one another is great, but ensure users have control over what's shared, especially where body data and GPS location are concerned.

AWARENESS

Devices which capture health data, or information about a user's surroundings, should be especially careful about sharing data. Never share without consent.

SLEEP

Acknowledge that sleep is an intimate behavior. If offering sharing features, ensure there is a clearly defined benefit to the user.

3 Clarify the source of the data

Be upfront about how the device is gleaning information. If a user doesn't understand where the data is coming from, they're less likely to trust the output. This applies not only at the raw data level, but also where data calculations are concerned. Understandably, you may not want to divulge your exact algorithms, but at least explain to users at a general level how you're arriving at any conclusions. For instance, if you claim to track when a user is asleep, explaining that you compare movement tracking against scientific data from specific sleep studies will help instill feelings that the device is a trusted source of knowledge.
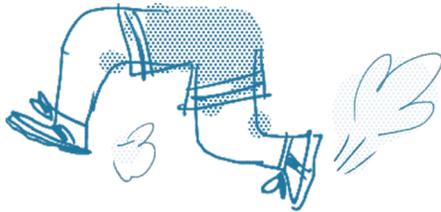
ACTIVITY

If the data collected isn't presented back to users in units they understand (e.g. steps, miles, etc.), make it clear how the metric is being calculated. For example "points" aren't valuable to someone who really wants to see miles walked.

AWARENESS

The data captured by a device targeting awareness should be measured in a way that aids the user in understanding the degree to which their surroundings and/or response to environmental factors impacts their behavior.

SLEEP

Sleep is complicated, and difficult to track. Help users understand types of sleep, and how the device is tracking both overall sleep and any specific sleep qualities.

4 Use context to drive insight

Pro-actively integrate data from other sources (e.g. location, calendar, similar users in the network) to create meaningful connections and deeper insight. Whenever possible, utilize environmental factors to derive more accurate behavioral data. Overall, the device should require as little direct input from the user as possible while consuming any available, relevant data; having to manually track information is a chore.
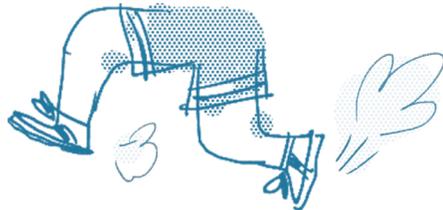
ACTIVITY

Until wearables are perfectly accurate, allowing users to edit recorded data would allow for greater control over the usefulness/accuracy of the device's outputs.

AWARENESS

Awareness sensors should provide all the data with no input from users.

SLEEP

Tracking sleep accurately is difficult. Use any available sources to help discern when sleep is actually happening, versus when someone is simply lying down to watch Netflix.

5 Compensate commitment

Give users the power to track their data over an extended period of time to enable longitudinal insights. Motivate users to continue tracking by learning about and reinforcing their personal goals. If the data shows a change in trends, make sure to let them know — if the change shows they're moving toward their goals, cheer them on and ensure they can easily see the progress they've made. If users start slipping in their goals, provide encouragement and clear steps they can take to get back on track.

ACTIVITY

Tracking activity data over time is one thing. Letting users know that they are on or off track to hitting their goals or are creating positive change creates a deeper connection, ultimately providing more value to the user.

AWARENESS

Tangibly demonstrate how awareness is positively impacting their lives.

6 Encourage through storytelling

Remind users why the data matters and what they can achieve by showing how others have benefited from using the device. Provide insights and information about the subject being tracked — beyond the user's own data — to help users form a comprehensive understanding of the subject. Show how the behavior being tracked can impact other behaviors and drive additional positive changes to the user's life.
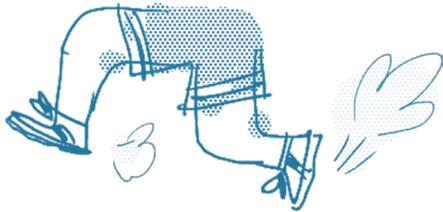
ACTIVITY

While the long-term story and activity history is important, also ensure to tell the day-to-day story. Highlight key moments of activity throughout a day, and tie daily activity back to long-term trends to provide context.

SLEEP

It's hard to observe your own sleep. Wearables should help bridge this gap, providing a compelling story of what's happening while a user sleeps, and why their sleep was better or worse than the night before.

7 Personalize without distracting

Wearables provide a direct connection between people and technology, and it's crucial that the device provides an experience tailored to the person wearing it. This means not only learning about user goals, but also who the user is — whatever metrics might drive specific, relevant insights related to their data.
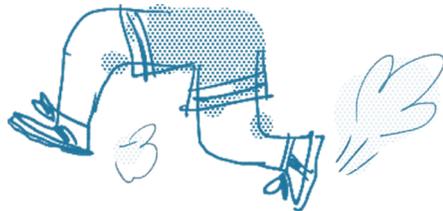
ACTIVITY

Many activity wearables track more than one thing and the ability to customize what is tracked/displayed is an important feature. Activity wearables are not a one-size-fits all device and should prioritize personalization and configuration.

AWARENESS

Some awareness wearables utilize sensors to capture data about the user's physiological state such as breathing patterns and activity level. Metrics such as body weight, height, and age help increase the accuracy of the data collected.


SLEEP

Learn about the user to help improve the accuracy of data. If the device knows they often sleep next to a partner (or pet), take extra care to track only the user's sleep.

8 Less obligation, more automation

The device must be dead simple to use. Ideally, users should never worry about if it needs to be charged, if it's collecting data, or if it'll survive your restless night of sleep. All you have to do is wear it. The device should, to the greatest extent possible, act autonomously; it should be aware of what it needs to track and shouldn't burden the user with any unnecessary interaction. Every point at which users have to manually start or stop tracking a session, or otherwise input data themselves, is a moment when the device is not providing full value as a wearable.
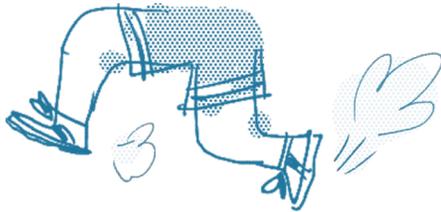
ACTIVITY

It should be clear when the user is actually being active and when they are not. Current activity wearables track things like arm movement to record activity levels. This measurement is susceptible to error and lowers trust about the accuracy of the device.

AWARENESS

When the user takes the wearable device off, wearable sensors should be automatically disabled.

SLEEP

Remembering to stop a sleep tracking program is not the first thing most people want to do in the morning. Use data, trends, and other insights to automatically sense when sleep starts and ends.

9 Enhance without distracting

Wearable devices should complement the lifestyle and image of the user, while prioritizing comfort and effectiveness. The aesthetic appearance should enhance the experience of wearing the device, and the form factor should be functional and unobtrusive. Finally, the wearable device should not demand the attention of the user or cause unwanted distraction.
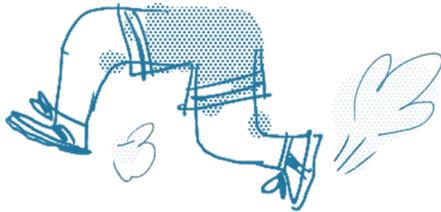
ACTIVITY

The device needs to seamlessly fit into the lifestyle of the user, taking care not to distract from the user's activities and adapting to fit a desired aesthetic.

AWARENESS

The difference between "awareness" and "distraction" can be tricky. Devices should primarily exist in the background, focusing attention when initiated by the user.

SLEEP

While some distraction during the day might be OK, distraction during sleep is unacceptable. People want to be awoken on their own terms; helping achieve that is great, waking someone up unintentionally is not.

10 Withstand the elements

Humans are physically capable of many things. As an extension of the human body, wearables need to withstand physical demands beyond most other hardware. Consider both the context of wear (Will it be worn on the wrist? ...thrown in a pocket? ...stuffed in an armband?) and the context of use (Will users wear this while running? ... while tossing and turning in bed? ...while diving in the ocean?). While sweat and friction may be heightened concerns for activity trackers, a more passive ride in a hot subway car might generate similar physical concerns.
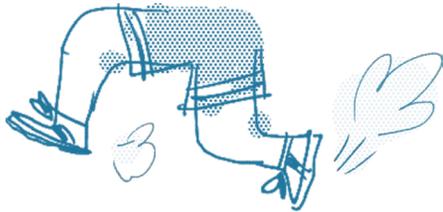
ACTIVITY

When the sole function of a device is to integrate into an active lifestyle, it must be both flexible (especially in how it is worn) as well as durable to stand up to the rigors of physical activity.

SLEEP

Sleep can often be an active endeavor, tossing, turning, and trying to find the comfort sweet spot. Ensure the device can withstand being bumped against a nightstand and be worn comfortably in a variety of sleeping positions.

Devices Covered

Our research covered a cross-section of devices available in Spring 2015. Each device covers one or more of the wearable groups we focused on: devices that track and motivate activity, devices that promote awareness, and devices that log sleep patterns (see for more on these groups)

	Fitbit Charge HR	Fitbut Surge	Fitbit Zip	Misfit Shine	Narrative clip	Spire	Withings Active Pop	Withings Pulse O2
Activity	X	X	X	X			X	
Awareness					X	X		
Sleep	X			X			X	X
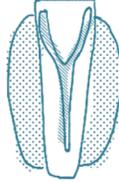
About us

Fuzzy Math is a user-experience design, strategy, and innovation firm dedicated to improving the product and service experiences of a diverse range of clients. Through research and design, we help our clients make their users happy.

Our user-centered design process solves complex problems through user research, expert analysis, prototyping, and collaborative co-design with stakeholders and users. Our engagements include training and workshops, innovation and strategy, research and evaluation, and interface design and delivery.

FOR MORE INFORMATION

Find us at www.fuzzymath.com or drop us a line at hello@fuzzymath.com — we'd love to hear from you!

Read more about wearables on our blog:
http://blog.fuzzymath.com/category/technology-ux/wearables/

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