THE PAST, PRESENT, AND FUTURE OF WEARABLE AT

You have likely heard of "wearables" before, as the term and its associated products have become increasingly popular in recent years. But believe it or not, wearables are a type of assistive technology (AT) that has been around for some time now. Examples of low-tech wearables include posture braces which provide postural support to individuals with osteoporosis or other similar conditions, compression socks which are designed to relieve swollen or aching legs caused by various disabilities, and cooling vests which can help wearers who are sensitive to heat. Nowadays, with advances in wearable technologies, the concept of wearables has taken on a whole new context and meaning.

Today's High-Tech Wearables

Wearables (sometimes referred to as wearable technology or wearable tech) are devices or sensors that can be worn on or embedded in your body to assist you in performing a specific task or function. They range between low-tech, such as those mentioned above, and high-tech wearables.

High-tech wearables have exploded in popularity over the last five years, appealing to wearers of all ages. Researchers predict that by 2020, the high-tech wearable market will be worth $34 billion - and that is no surprise given that "one in five adults either owns or has used a [high-tech wearable]," according to Forrester Research.

There is a multitude of high-tech wearable options. Some are standalone products while others work in concert with software and mobile applications (apps). Below are a few major categories of high-tech wearables available on the market today:

Smartwatches
The interfaces of these watches are connected to the Internet and provide you with a myriad of iOS- and Android-based mobile app options. These wearables are typically

companions to other iOS- and Android-based items such as smartphones and tablets. Like most people, you may be familiar with Apple's Apple Watch, but Samsung, Pebble, Tag Heuer, and many other companies also create smartwatches.

Fitness Trackers

Health/fitness wearables, the vast majority of which you wear around your wrist like a bracelet, are highly successful in today's marketplace. Similar to smartwatches, there are a number of companies that manufacture various versions and styles of health/fitness wearables. Even though the features may vary from one device to the next, most health/fitness wearables include at least a step counter, a heart rate monitor, and a sleep tracker.

Headgear

Wearable headgear typically involves a pair of glasses or a head-mounted display that covers your eyes. They generally rely on virtual or augmented reality and are customarily utilized for entertainment purposes. However, users and developers alike are finding new ways that headgear can be useful for individuals with disabilities.

Smart Clothing

This item is newer to the market and includes all types of garments, but the most popular forms of smart clothing are athletic shirts and footwear that track everything from your location to your heart rate.

Jewelry

This category includes items such as modified pendants, bracelets, rings, and earrings – that can cover a wide range of purposes. For example, one item might function as a GPS, while another as a step counter or a communication aid.

The universal, inclusive design of many high-tech wearables also makes them extremely beneficial if you have a disability. Most high-tech wearables are a part of the Internet of Things (IoT) network, which is a group of products that can be automatically synced together through Internet connections. The IoT network affords you greater convenience and independence because you can exchange and make use of information on any device within the network you use at home, at work, or in other places.

Below is a sampling of newer high-tech wearables that are useful for people with various types of disabilities:

Hearing

- [ReSound Hearing Aids](#) - Hearing aids have been around since the late 1800s, and developers continue to enhance their capabilities. The ReSound hearing aid connects with a smartphone or tablet to give you custom volume control. So regardless of where you are, you can discreetly amp up the volume.
- [Versatile Extra-Sensory Transducer](#) (VEST) - If you are deaf or hard of hearing, this lightweight, noninvasive vibratory vest allows you to understand sound and communicate with others. Still in its prototyping stage, VEST helps you perceive auditory information through small vibrations on your torso.

Cognitive

- [Google Glass](#) - This pair of smart glasses is essentially a hands-free, wearable computing device that looks like a pair of eyeglasses. The lenses have an interactive smartphone-like display that allows you to take pictures, record videos, check e-mails, receive notifications, and look up information instantaneously. Its built-in accessibility features (i.e., voice activation and eye and head control) can assist you if you have limited motor functions. Google Glass can also be controlled with an external switch, keyboard, or button if you are unable to use the default control's touchscreen. Moreover, it can be modified to operate your power wheelchair if you use one.
- [Independence Day Clothing](#) - This clothing line, designed for children and young adults with Autism and other cognitive disabilities, includes a discrete GPS tracker in each garment. On the off chance that you or a family member wearing the clothes gets lost, you can determine where you are or help locate him or her using the GPS tracker.

Sight

- [Lechal Shoes](#) - These shoes offer turn-by-turn navigation to individuals with a visual impairment. Using haptic technology, Lechal Shoes sends gentle vibrations to your right or left foot - depending on which direction you have to turn - both before and at the turn. For example, if you are walking and you feel a vibration in your left shoe, it is an indication that you will have to make a left turn soon. Synced with your smartphone, Lechal Shoes can remember locations and understand certain foot gestures to guide you to your destination.
- [Dot Smartwatch](#) - Dot is an alternative to the mainstream smartwatch if you have a visual impairment. It syncs with Bluetooth technology and displays four braille characters at a time on the smartwatch's face. Rather than relying on a screen reader to interact with Dot's interface, you can read its content by touching the displayed tactile braille characters. You can also adjust the

character speed and use Dot to peruse your apps, e-mail, and other tasks anytime.

There are also numerous mobile apps that can be used with wearables. Read AbleData's guide The Accessibility and Mobile Apps Story for additional examples or search for them at Google Play or Apple's iTunes Store.

Tomorrow's High-Tech Wearables

Much progress has been and continues to be made in the field of high-tech wearables. The potential for these devices to improve the productivity and well-being of people of all ages and abilities is vast. In fact, researchers are in the beginning stages of testing the next generation of high-tech wearables: implantables.

Implantables are objects or sensors connected to the IoT that are embedded in your body. They can be used for a range of purposes, but thus far researchers are using these devices to modify the body, help with healing, or communicate with other IoT objects.

Research universities and big-name influencers like Google are creating new implantable prototypes. Some of them include smart tattoos and contact lenses that can monitor aspects of your body's chemistry, such as internal electric signals from the brain, heart, and muscles. The possibilities for implantables are endless - and field experts predict that we will see more embedded devices in the next 10 years.
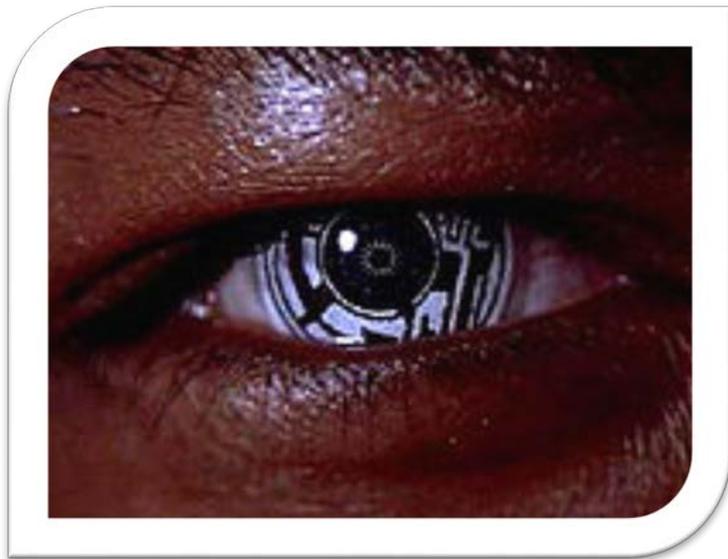
Gadi Amit, president of NewDealDesign - the group behind the design of the health/fitness wearable FitBit - believes the future of wearables "is about weaving together biology, science, medicine, electronics, a lot of interaction, and cultural wisdom." There is no telling just how much high-tech wearables and implantables will increase our independence and improve our quality of life in the years to come.

For More Information

Contact us at AbleData.

References

AssistiveWare. (n.d.). *Proloquo2Go*. Retrieved from http://www.assistiveware.com/product/proloquo2go

AssistiveWare. (n.d.). *Proloquo4Text*. Retrieved from http://www.assistiveware.com/product/proloquo4text

Beres, D. (2015, February 18). These high-tech shirts and pants can help protect kids with autism. *Huffington Post*. Retrieved from http://www.huffingtonpost.com/2015/02/18/autism-gps-device_n_6705368.html

Bolton, D. (2015, December 12). *Why 2016 will be the year of mass wearables adoption*. Retrieved from Application Resource Center from Applause Web site: https://arc.applause.com/2015/12/12/wearables-mass-adoption-2016-forrester/

Cassagnol, D. (2016, April 28). *Consumers adopting innovation: Wearables, wireless audio, connected devices experience largest ownership growth in 2016, says CTA*. Retrieved from Consumer Technology Association Web site: https://www.cta.tech/News/Press-Releases/2016/April/Consumers-Adopting-Innovation-Wearables,-Wireless.aspx

Dopacio González, Z. (2015, March 31). *Top smart hearing devices for 2015*. Retrieved from Wearable Technologies Web site: https://www.wearable-technologies.com/2015/03/top-smart-hearing-devices-for-2015/

Ehrenkranz, M. (2014, February 4). *Wearable tech for people with disabilities: How a tech specialist Is modifying Google Glass to be more accessible*. Retrieved from iDigitalTimes Web site: http://www.idigitaltimes.com/wearable-tech-people-disabilities-how-tech-specialist-modifying-google-glass-be-more-accessible

Greenberg, A. (2015, August 4). This new watch lets blind people read real-time smartphone data in braille. *Time*. Retrieved from http://time.com/3983375/smartwatch-blind-dot-braille/

Independence Day Clothing. (n.d.) *Home*. Retrieved from http://www.independencedayclothing.com/

Kosir, S. (2015, March 23). *A look at smart clothing for 2015*. Retrieved from Wearable Technologies Web site: https://www.wearable-technologies.com/2015/03/a-look-at-smartclothing-for-2015/

Lamkin, P. (2016, February 17). Wearable tech market to be worth $34 billion by 2020. *Forbes*. Retrieved from http://www.forbes.com/sites/paullamkin/2016/02/17/wearable-tech-market-to-be-worth-34-billion-by-2020/#38d60f5c3fe3

Lechal. (n.d.). *Accessibility*. Retrieved from http://www.lechal.com/accessibility.html

Medaris Miller, A. (2014, November 20). Wearable tech for people with disabilities. *U.S. News & World Report*. Retrieved from http://health.usnews.com/health-news/health-wellness/articles/2014/11/20/wearable-tech-for-people-with-disabilities

Morris, D. Z. (2015, February 10). Wearable technology is redefining what it means to be disabled. *Fortune*. Retrieved from http://fortune.com/2015/02/10/wearables-disability/

Olson, P. (2014, June 19). Wearable tech is plugging into health insurance. *Forbes*. Retrieved from

http://www.forbes.com/sites/parmyolson/2014/06/19/wearable-tech-health-insurance/#46c397075ba1

Plummer, Q. (2015, June 28). *Google smart contact lens to hit the market soon?* Retrieved from Tech Times Web site: http://www.techtimes.com/articles/63868/20150628/google-smart-contact-lens-to-hit-the-market-soon.htm

Stanton, K. (2015, January 7). *The evolution of wearables and what's coming next*. Retrieved from Consumer Technology Association Web site: https://www.cta.tech/News/Blog/Articles/2015/January/The-Evolution-of-Wearables-and-Whats-Coming-Next.aspx

Starner, T. (2013, December 17). Google Glass lead: How wearing tech on our bodies actually helps it get out of our way. *Wired*. Retrieved from http://www.wired.com/2013/12/the-paradox-of-wearables-close-to-your-body-but-keeping-tech-far-away/

Stroud, B. F. (n.d.). Google Glass. Retrieved November 10, 2016, from http://www.webopedia.com/TERM/G/google_glass.html

Sung, D. (2015, August 3). *What is wearable tech? Everything you need to know explained*. Retrieved from Wearable Web site: http://www.wareable.com/wearable-tech/what-is-wearable-tech-753

Tsukayama, H. (2014, February 27). Everything you need to know about Google Glass. Retrieved November 10, 2016, from https://www.washingtonpost.com/news/the-switch/wp/2014/02/27/everything-you-need-to-know-about-google-glass/

Wilson, M. (2014, October 1). *From the designers of Fitbit, a digital tattoo implanted under your skin*. Retrieved from Fast Company Web site: http://www.fastcodesign.com/3036175/from-the-designers-of-fitbit-a-digital-tattoo-implanted-under-your-skin