

# Imran Ahson

Blog

Web & User Experience Design

This blog series examines how the idea of employment is changing in the digital age, with a focus on the Web & UX sector. It examines the relationship between wearable technology and behaviour modification, including usability, accessibility, ethical considerations, and potential future directions.

For Web/UX/Digital designers, wearables are becoming more and more important since they make tasks easier to do. According to Jiang, et al (2024), 'Moreover, with the development of automated machines, by replacing low-level work tasks, it is beneficial for enterprises to save production and operation costs, bringing about an output scale expansion effect' By this allusion, it is implied that companies may gain from using machines as they are less expensive than hiring employees and do tasks more effectively. This approach saves time and reduces stress, often utilizing data and sensors to help users understand their behaviours and facilitate behaviour changes. Designers of such devices must grasp key emerging concepts. 'With the wide application of deep cognitive learning, image recognition, haptic perception, and other technologies in the automation field, the flexibility, precision, and intelligence of intelligent robots have been greatly improved' Jiang, et al (2024). This indicates machines surpass us in many areas, handling our workload and more.

Because wearables are worn on the body, there are ethical questions raised, particularly with relation to safety. Web/UX designers need to handle important privacy and security challenges brought up by tracking movement, location, and behavioural data. ‘Wearable technology can also pose health risks, such as skin irritation and allergic reactions caused by the materials used in the device.’ (Rue 2023)

An antivirus company said that ‘Smart watches create vulnerabilities on business networks’. Smart watches have plenty of business applications, from taking calls to taking notes. Norton (2018). This puts businesses at risk as data can be recorded and tracked by third parties. They also have said that ‘most common problem was insufficient user authentication’ Norton (2018). Meaning that cyber attacks are very easy to implement and therefore, can put users and businesses in danger.

For example CNN investigated use cases where the U.S. Department of Health and Human Services Food and Drug Administration stated that ‘The use of these devices can lead to inaccurate measurements of blood glucose, also known as blood sugar, and errors in diabetes management that can be life-threatening, the agency warned.’ (Cheng 2024) Devices such as these can lead to the danger of lives as inaccurate data can be lethal as some people may depend their lives on it to live. Therefore UX researchers have to take into account the drawbacks of these issues when designing a prototype.

Wearable devices also raise concerns regarding privacy and how well protected they are as they take a lot of our personal information in. 'Among those who use smartwatches or fitness trackers, 40% say they are concerned about the privacy of the data that their device collects' (Deloitte Insights)

There has been some abuse of personal data. One example is Apple. A news article on the guardian by Johana Bhuiyan says that 'Apple receives thousands of law enforcement requests for user data a year' Johana Bhuiyan, (2022) and that they cooperate without problems with law enforcement. 'Apple received 7,122 law enforcement requests in the US for the account data of 22,427 people. According to the company's most recent transparency report, Apple handed over some level of data in response to 90% of the requests.' (Johana Bhuiyan 2022). This raises some concerns about if this is ethically right or wrong as this is being done without consent or done without the knowledge of the public.

Furthermore, such actions raise broader concerns about the balance between national security interests and individual privacy rights. While law enforcement agencies argue that access to user data is vital for investigations and maintaining public safety, critics argue that it sets a dangerous precedent for unchecked surveillance and erosion of privacy rights.

However, there are incidents where wearable devices have saved lives such as a newborn baby that had wearable defibrillator 'which detected her irregular heart pattern and administered a shock treatment that saved her life.' (Jan-Lunter, 2023). Wearable devices

play a crucial role in providing quick alerts, potentially preventing fatal situations. However, alongside recognizing their benefits, UX researchers must address moral and legal issues, particularly regarding data security and privacy. Balancing wearable technology's advantages with user privacy requires proactive steps from regulatory agencies and technology companies.

A psychology experiment was carried out by Tiffanie Wen in her attempt to test and break her habits using electric shocks using a device called 'Pavlock'. The nature of this product is to for example if you are using phone before bed then '– they will begin to associate the behaviour with unpleasantness and enjoy it less, reducing the amount they do it.' (Wen, 2017) The unpleasant would be tapping the wristband known as Pavlock to give them a shock. Tiffanie Wen says doing this 'helped them break habits like nail biting or eating candy.' (ibid).

The task was that they had to 'instructed to make a response based on the polarity of brief trains of click sounds simultaneously presented to both ears. The polarity was drawn randomly on each trial. If subjects heard more click sounds in the right ear, they pressed the right Command key with the right index finger. If they heard more click sounds in the left ear, they pressed the left Command key with the left index finger' (Kubanek, Snyder and Abrams, 2015)

What's interesting about this task is that it demonstrates the brain's ability to process and respond to auditory stimuli in real time. By instructing participants to respond based on the polarity of brief trains of click sounds presented to both ears, researchers are

essentially probing how the brain processes and integrates information from both auditory channels.

They found that ‘a reward led to a repetition of the previous choice, whereas a penalty led to an avoidance of the previous choice.’ (Kubaneck, Snyder and Abrams, 2015). This implies that the participants adjusted their behaviour in response to the outcomes reward or punishment. The Fogg behaviour change model may have been used to induce this type of outcome as the participants were given a reward thus creating a motivation to continue the experiment. ‘three elements must converge at the same moment for a behaviour to occur: Motivation, Ability, and a Prompt’ Fogg (2022).

In summary, UX researchers should prioritise ethics, user safety, data privacy, and user control must come first in the design of wearable experiences and user interfaces going forward. Through the use of ethical design principles, data privacy protection, user independence, safety and health assurance, risk assessment, and benefit balance, designers may produce wearable devices that improve user experiences while promoting trust and well-being.