Consuming info with wearables

Goal

The goal is to find ways in which users can consume information.

Motivation

At the moment Zenya is used as a source of information. One person uploads documents (e.g. PDF) and others can read them. The standard way users consume the information is to simply read the document from a digital device. Infoland want us to research AR to see if AR helps improve the workflow. So far we have found that AR glasses and other wearables like smartwatches are helpful resources for users to consume the information they need.

Research questions

Main question

In what ways can users potentially consume information?

Sub questions

- What are the potential threats/weaknesses/pain-points for each way users can consume information?
- What are the potential strengths of each way users can consume information?

Approach

The research questions will be answered by applying desktop research.
A list of wearables will be defined that can help users consume information. After that, a list of methods on how users can consume information will be put together. Potential threats/weaknesses/strengths/opportunities of these wearables and methods will be noted.

Results

General advantages/disadvantages/threats/opportunities of wearables

- **AR glasses**
  - \+ Handsfree
  - − more difficult to navigate within a UI, costs more time
  - − people with glasses might not be able to fit the AR glasses on top of their own glasses
  - − battery life is only 1-2 hours
  - − In order to use the glasses, the user needs to focus on the screen so they can't focus on/look at other things around them
  - − people might not need/want to wear AR glasses all day due to them being too heavy or getting tired eyes from staring at the screen. Where do they leave the glasses while they are not wearing them? The users might not have a suited space nearby for them to put the glasses.

- **Smartwatch**
  - \+ easy to take with you
  - \+ most people are already used to wearing a watch
  - \+ average battery life is 1 to 2 days
  - \+ handsfree
  - − some people aren't allowed to wear a watch during their work because of safety, hygiene or even privacy reasons.
  - − can't contain much information due to the small screen size.

- **Headphones/Earbuds:**
  - \+ good for noisier environments e.g. when working in a fabric
  - \+ better audio quality than smartphones
  - \+ works well with other devices like smartwatches or smartphones
  - − might be uncomfortable wearing depending on the amount of time, type of headphones/earbuds and personal preferences of each person
  - − headphones might not be possible to wear depending on the environment; construction workers who need to wear a helmet for instance, often already have headphones that protect their ears from loud noises

Ways to consume information

Audio

- **Sonification (translating data generated by the user into audio)**
  Example: a fabric worker is not allowed to run/walk above a certain speed in a warehouse, because of safety rules. With sonification his walking speed is measured, and the data can be converted into sound. If the fabric worker's speed is higher, a higher sound will be played as output so that the fabric worker knows he's going faster and will be more aware of his speed.
  - − hard to implement, only useable for specific use cases
  - + doesn't require the user to change their routine, easy interaction
- **Sound effects**
  User doesn't need to look into the glasses or any screen to know what's going on, because a sound will be played if something specific happens, e.g. a new manual gets put on the screen and a sound effect is played to indicate this.
  - + easy to implement
  - + doesn't require the user to change their routine, easy interaction

- **Narrating voice (text to speech)**
  Text gets read out loud for the user.
  - − might be annoying/boring depending on the type of voice and how long the text is that's being narrated.
  - + doesn't require the user to change their routine, easy interaction

Video

- **GIF**
  If the user needs to perform a certain, short step/action and the user needs an animation to understand what to do, a GIF can be useful.
  - − the user doesn't have much control over the GIF other than pausing it
  - − users have to partially look at their screen while they're working
  - + makes it easier for the user to understand what is expected from them
  - + easy to implement

- **MP4/Video player**
  If the user needs to perform a longer, more complicated action that requires visual instructions a video player can be useful.
  - − the user has to perform multiple actions to control the video; pause, rewind, fast forward, etc.
  - − takes up a lot of space
  - − users have to partially look at their screen while they're working
  - + makes it easier for the user to understand what is expected from them
  - + can contain loads of information for the user

Images

- **Symbols/Icons**
  Symbols/icons can inform the user of something without taking a lot of space on an interface. For instance, an arrow can inform the user where they need to look. This is better than describing the user where they need to look through text.
  - − symbols/icons can be misunderstood
  - + takes up little space on an interface

- **Bitmap/photos**
  A photo can tell a thousand words. It's best used when describing a situation to someone.
  - − the user doesn't have much control over the GIF other than pausing it
  - − users have to partially look at their screen while they're working
  - − takes up a lot of space
  - + can contains a lot of information without needing interaction

Vibration

- **Vibration patterns**
  e.g. 1 vibration means you've got a message, 3 vibrations means there's an emergency
  - − the number of patterns a user can remember is very limited, for this reason vibrations can't inform the user much.
  - + user can still feel vibrations in a noisy environment and thus consume the information

Ways to consume information with wearables

- **AR glasses**
  - Can use images, pictures, audio
- **Smartwatch**
  - can use vibration

- **Headphones/Earbuds**
  - can use audio

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Conclusion & recommendations

To answer the main research question “In what ways can users potentially consume information?”:

Users can consume information through the following general means:

- Audio
    - Sonification
    - Sound effects
    - Narrating voice (text to speech)
- Video
    - GIF
    - MP4/video player
- Images
    - Symbols/icons
    - Bitmap/photos
- Vibrations
    - Vibration patterns

The wearables

Sources

- https://kamranasghar.medium.com/how-long-does-a-smartwatch-battery-last-and-how-to-improve-it-ba5482952d1b#:~:text=The%20average%20smartwatch%20lasts%20typically,struggling%20to%20improve%20battery%20life
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