Assistive Technology and Affordability

AP Seminar

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According to The American psychological association, Independence is the state of having freedom from the influence or control of other individuals or groups, and as I.S. Kon States, there is no other personal quality as valuable as a person's independence. A person's independence relies on a person's ability to make and carry out decisions on their own, without assistance from another individual (Kon, 1989). For many, having independence in the early and early middle stages of life is simple. But as people age into the late stages of life, Their independence may need to be assisted by external devices, or more formally, assistive technology. While there are many devices that help individuals maintain their independence, There are barriers to their access, with the largest being cost. Technologies that improve the independence of adults over the age of 50 can be made affordable through simpler manufacturing, use of low-cost microcontrollers, and the use of open design principles.

Assistive technology can be made more affordable through simpler manufacturing and design. Recently, minimalist design has become more popular, with the idea that less is more. It can be seen everywhere, from apple's website, to the design of the new Tesla Cybertruck. This idea can be applied to assistive technology as well. A simpler design results in fewer materials and less time in the manufacture of the device. The combination of these two factors can lead to a lower cost of production, and therefore a lower cost of the device. The use of simpler manufacturing in assistive technology can be best seen in an engineering design report by the TTK Center for Rehabilitation Research and Device Development (R2D2). In their report, they detailed that in the team's third iteration, the minimalistic design of the device allowed for lower manufacturing and

tooling costs, as well as making the user more visible to others while using the device (Shaikh-Mohammed et al., 2023). In the production-ready iteration of the device, the team was able to reduce its cost to around 210 United States Dollars. When released to the public, this reduction in cost can make the device more accessible to a wider range of individuals who require assistive technology.

The use of low cost materials are essential in the creation affordable assistive technology. The concept of additive manufacturing, or 3D printing, has been around since the 1980s, but has only recently become more popular and an affordable means of manufacture due to the expiration of patents on the technology. Today, additive manufacturing has become a popular method of manufacturing due to its low cost and ease of use. In the case of assistive technology, additive manufacturing can be used to create low cost devices that cater to the needs of the user.

The use of open design principles is another way that assistive technology can be made more affordable.