Bridging the Disability Employment Gap

Introduction

Around one billion of the 1.3 billion people living with disabilities worldwide are of working age. However, they face significant challenges in gaining employment, which not only impacts their quality of life but also harms the economy by excluding a significant portion of the workforce. For instance, in 2019, the U.S. alone spent $145 billion on disability insurance. Moreover, only 40% of working-age people with disabilities are employed, compared to almost 80% of their non-disabled counterparts. Closing this employment gap could have a significant positive impact on the economy and society as a whole.

Fortunately, the emergence of Industry 4.0 technologies, including projected work instructions (also called Projected Augmented Reality or Projected AR), is helping to address this issue by reducing physical and cognitive barriers. These technologies make work more accessible for people with disabilities by automating many of the small decisions, thus lowering the amount of mental effort required. It's akin to a GPS system that provides step-by-step guidance for drivers, allowing them to focus on the road ahead rather than worrying about making wrong turns.

The positive impact of these technologies goes beyond just empowering people with disabilities to participate in the workforce. By increasing the size of the labor pool, they reduce the need for government subsidies for those who are unable to work. Additionally, as more people with disabilities join the workforce, they help break down the stigma associated with hiring them. In turn, this encourages more employers to consider people with disabilities for their job openings, further reducing the employment gap.

In summary, projected work instructions and other Industry 4.0 technologies are revolutionizing the workplace by bridging the disability employment gap. By reducing the physical and cognitive barriers that prevent many people with disabilities from working, these technologies create a more inclusive and prosperous society.

Figure 1: Real-world deployment of Pathfinder at a factory which has disabled workers as 50% or more of its workforce

Augmented reality on the factory floor

Retrocausal and other forms of AR

Augmented Reality (AR) is a cutting-edge technology that overlays computer-generated images onto the real world, providing users with a composite view. There are several form factors of AR, including projector-based, wearables, tablets, and spotlights, each with its own unique features and applications. However, the biggest demand for AR lies within the industry, where it is transforming the way work is performed.

AR technology offers numerous benefits to industry workers, including the ability to display work instructions directly on a part, making it easier for workers to understand what needs to be done. This helps to reduce errors, improve efficiency, and enhance safety in the workplace. AR can also be used to train workers more easily by providing step-by-step instructions on how to perform a

task. By using AR technology, workers can learn in a hands-on, immersive environment, allowing them to gain practical experience without the risk of injury or damage to equipment.

One of the most popular forms of AR in the industry is projector-based technology. This is where Retrocausal comes in, as the leading provider of projector-based AR work instructions on the market. Using projectors, Retrocausal ensures the most intuitive and accessible work instructions, requiring little to no alteration of a worker's job steps. This helps to ensure that workers can quickly and easily understand the instructions and perform their tasks with greater accuracy and efficiency.

AR technology is revolutionizing the industry by providing workers with real-time guidance and feedback, helping to reduce errors, improve safety, and enhance productivity. With the continued development of AR technology and the increasing demand for more intuitive and accessible work instructions, Retrocausal and other AR providers are poised to play a critical role in shaping the future of industry.

Projected Work Instructions Empower Disabled Workers in the Workplace

Projected Work Instructions can be a game-changer in enabling people with disabilities to work, especially for those with cognitive disabilities. While physical disabilities can be addressed with good work design and assistive technology, cognitive disabilities often require more support. One of the ways in which AR can help is by reducing the role of memory in work, which frees up cognitive bandwidth for operators. Traditionally, paper or monitor-based work instructions have been used in manufacturing, which requires operators to remember the exact steps of the procedure every time they perform the work. This can be a significant challenge for operators, particularly when they rotate around the plant. By displaying the right work instructions at the right location and time, AR eliminates the need for memory, ensuring that the operator can do the job correctly every time.

AR also helps to focus the worker's attention on the work at hand by providing highly visual and intuitive projected work instructions that guide the worker through each step of the process. In this way, AR technology ensures that the worker can perform the job more effectively and efficiently. Furthermore, AR technology can assist in enforcing good work design by keeping the work within the "golden zone" of the operator, which is the optimal area for humans to do work. For workers with physical disabilities, AR can assist in physical job tasks such as lifting, pinching, or hammering. Emerging technology such as collaborative robots, exoskeletons, and gloves that apply force are also being developed to help those with physical disabilities.

Overall, AR technology has the potential to create a more inclusive and accessible workforce by reducing barriers to work for people with disabilities. By enhancing the abilities of disabled workers, AR technology can increase the size of the labor pool and decrease the number of

government subsidies required. This is not only a moral imperative, but it also makes economic sense by creating more value for companies and the economy as a whole.

Global Implications

Incorporating more accessible work environments through technology can increase the demand for hiring individuals with disabilities, which benefits not only the disabled population but also businesses and taxpayers. For individuals with disabilities, finding work can often be challenging, and having more job opportunities can provide a sense of pride and purpose. Moreover, businesses can benefit from a larger labor pool and gain access to skilled workers who can contribute to the company's growth. In many countries, a significant percentage of working-age people with disabilities are unemployed, and technology can help lower this number, offering new employment opportunities for both individuals and businesses.

By providing individuals with disabilities the chance to work, this can also decrease the need for government subsidization of this population. In the United States, for example, the government spends $145 billion on disability insurance. When more people can gainfully work, they may not have to rely solely on subsidies, which reduces tax expenditures and enables the government to allocate funding elsewhere. The individuals with disabilities can also spend their earnings, which can further boost the economy. All of these benefits make it clear that creating more accessible work environments is not only beneficial for individuals with disabilities but for society as a whole.

Conclusion

In today's rapidly advancing technological landscape, our approach to work is changing. The emergence of new technologies is creating new opportunities for individuals with disabilities, enabling them to work collaboratively with the help of innovative tools like Pathfinder. This shift towards disability inclusion is not only socially beneficial, but also economically advantageous for all parties involved. By providing disabled individuals with the opportunity to work, we are empowering them to experience a greater sense of fulfillment and financial independence. Moreover, we are expanding the labor force and reducing the need for government subsidies. As we move towards Industry 4.0, it's important to recognize the value of proven AR technologies like Pathfinder, which blend human intelligence with cutting-edge tools to create sustainable and inclusive job opportunities for everyone.