

XR TECHNOLOGY & MANUFACTURING



WHAT IS THE XR ASSOCIATION?

The XR Association promotes the dynamic growth of the XR industry. We convene and educate policymakers, thought leaders, researchers, developers, civil society, and the public on XR's infinite potential and serve as the premiere resource for anyone interested in learning about the applications of immersive technologies. Our members—Oculus from Facebook, Google, HTC VIVE, Microsoft, and Sony Interactive Entertainment—are united in our mission to champion the responsible development and thoughtful advancement of XR solutions that foster positive societal outcomes. Let us help you explore the endless potential of XR.

WHAT IS XR TECHNOLOGY?

XR is an umbrella term encompassing virtual, augmented, and mixed reality technology as well as other forms of alternate, expanded, or immersive reality applications, including those not yet invented.



Virtual Reality (VR)

VR replaces or occludes a user's reality with a new virtual reality. This new reality can be fantastical, like a faraway galaxy, or practical, like a training warehouse.



Augmented Reality (AR)

AR layers virtual content, such as digital objects or information, onto real-world images captured from a device's camera.



Mixed Reality (MR)

MR blends the digital and physical worlds, empowering users to interact with both in real time.

XR is changing the way we learn, do business, and provide essential human services. By delivering efficiencies in manufacturing, enhancing workplace safety, accelerating learning and job training, providing risk-free first responder training, improving healthcare and medical services, and providing rich experiences to individuals living with disabilities, XR is poised to become a part of daily life for users across the globe. XR is the technology of the future—today.

XR IS IMPROVING QUALITY, EFFICIENCY, AND SAFETY IN MANUFACTURING

XR is rapidly gaining traction in the manufacturing sector, where it allows engineers to practice various "what-if" scenarios in virtual space - ultimately enhancing safety, delivering cost savings, and improving speed and accuracy. With respect to product design, VR improves manufacturers' approach to predictive analytics, helping find design flaws in a matter of minutes rather than months. AR is similarly improving engineers' speed and accuracy as they work on complex assembly projects, saving time and money.

MANUFACTURING QUALITY AND EFFICIENCY



Product Design

VR can spare manufacturers from developing countless physical prototypes by allowing the creation of interactive virtual models. [Ford Motor company is working with Gravity Sketch](#), a 3D VR tool that enables designers to create more human-centric vehicle designs - obviating the need for the 2D design stage and speeding the product design process from weeks to hours. Shifting to a VR design model could revolutionize the entire process by drastically reducing development time and allowing for more 3D representations in the evaluation stage.



Complex Assembly

Engineers at Lockheed Martin no longer need years of training to be ready to assemble F-35 aircrafts. By wearing AR glasses that overlay images onto their real working environments, engineers can see renderings of cables, bolts, parts, part numbers, and instructions on how to assemble a particular component. This new method has been shown to increase engineers' accuracy to 96% while increasing their speed by 30%. As the lead contractor for [NASA's Orion spacecraft](#), [Lockheed Martin is also using AR to increase production efficiency and quality](#): rather than spending a week on a complex assembly process, technicians wearing AR glasses can finish the same process, with fewer errors, in less than one day.



Streamlined Logistics

Logistics company DHL successfully carried out a pilot project in which AR was used to implement '[vision picking' in warehousing operations](#). Staff were guided through the warehouse by graphics displayed on AR smart glass to speed up the picking process and reduce errors. The pilot resulted in a 25% increase in efficiency. DHL has announced plans to expand efforts in advanced technologies including AR at 350 of its facilities in North America. With exponential growth in e-commerce, the company plans to make a staggering \$300 million investment.

WORKER TRAINING AND SAFETY



Upskilling for the 21st Century Economy

Rather than rely on a single skillset, workers are increasingly expected to [upgrade their skills quickly and efficiently throughout their careers](#), particularly in industries where generations of technology outpace generations of workers. Case in point, auto mechanics are being trained to service and maintain fully electric vehicles through VR. [Engineering giant Bosch and auto giant Ford have teamed up to develop applications where auto technicians use VR to "go inside" an electric vehicle](#), navigate through various modules as if they were walking through rooms, identify problems, and make repairs.



Enhancing Worker Safety

Whether on the factory floor of a manufacturing plant, at a construction site, or on an offshore oil rig, safety is paramount. Introducing workers to new industrial environments with unfamiliar protocols and potentially dangerous equipment is often a recipe for injury. [With XR applications, inexperienced personnel can be trained in low-risk environments without the need for expensive additional resources](#). What's more, by digitally simulating production processes, dangerous maneuvers can be identified in advance for even the most experienced individuals. Success stories include Tyson Foods, where 89% of workers said they felt more prepared for their jobs after VR training, and Ford Motor Company, which reduced the injury rate for its more than 50,000 U.S. "industrial athletes" by 70% using VR training.