ENTERPRISE AND INDUSTRIAL XR TRAINING

KEY FINDINGS

Industrial sectors are known for high complexity: supply chains, product, processes, maintenance, scheduling, management, etc., and have been quickly moving toward digitization across their operations.

Augmented Reality (AR) and Virtual Reality (VR) are an increasingly common element of this digitization, helping to address these difficulties. Three main use cases have emerged from successful Extended Reality (XR) implementations: training, step-by-step instruction, and remote assistance.

INDUSTRIAL XR MARKET

AR and VR have seen slow but steady growth in the industrial enterprise. False starts with dying XR hype in 2017 to 2018 and investment hesitation spawned from COVID-19 delaying potential again in 2020 and 2021. AR devices led adoption early, primarily enabling remote assistance and step-by-step instruction use cases. Training is a more recent use case leader, as VR becomes more common in the industrial sector, and Mixed Reality (MR) smart glasses decline in price and rise in user acceptance. Big company impacts are included here, such as from Apple and Meta. These device are included in this forecast and represent an inflection point in 2024. Greater VR momentum may be seen depending on market opinion about these new products.

INDUSTRIAL METAVERSE AND XR

XR and the industrial metaverse are not the same, but do play together. Today, metaverse is more of a catch-all term for immersive technology, but over time, the metaverse solidifies into a supporting network for all device types. Training is a major component of the Industrial XR market, and thus the industrial metaverse market. High-fidelity visuals and real-time data can be provided by a metaverse platform. Digital twins and simulation are a more mature component of the industrial metaverse, and can empower XR training through data connections, real-time updates, and persistent experiences.

KEY USE CASES

EMPLOYEE TRAINING

Using AR and VR in employee training is among the most mature and widely adopted use cases in enterprise verticals. XR helps employees with realistic and interactive experiences, helping employees gain a deeper understanding of complex/abstract concepts, apply knowledge, and practice skills in secure environments.

AR/VR training solutions have gained momentum due to both cost savings and efficacy improvements over existing training methods.

VR training simulations are more suitable when employees need to be familiar with handling hazardous material and reacting to complicated scenarios, such as how to react in a fire. AR is more effective in scenarios when employees need to practice technical skills. Both tools are suitable for practicing soft skills; however, at the current stage, VR solutions are more efficient and mature for practicing public speaking or problem-solving skills.

WHY USE AR/VR FOR EMPLOYEE TRAINING?

- Both AR and VR are cost-efficient training methods that allow organizations to train multiple employees without consuming actual sources and materials, and without unnecessary traveling. Thanks to the "see what I see" feature in AR, instructors can share content with multiple attendees and record the session. AR (and VR) solutions can ensure that all trainees have access to the same content/view.

- AR/VR training can save thousands of dollars per employee in comparison with traditional training that includes costs for materials, traveling, and instructors. VR training has proven to be 1.5X faster than e-learning platforms and 4X faster than classroom learning.

- AR/VR training applications enable employees to train under realistic conditions, while ensuring safety. Practice under realistic conditions contributes to better understanding and knowledge retention for the long term.

- AR/VR training applications collect and analyze data regarding a trainee's performance, allowing instructors to provide immediate feedback and predict performance rates.

- Both AR and VR solutions provide the option of developing personalized training content, assisting trainees with improving their weak areas, and practicing skills in accordance with their job's tasks.

- Both AR and VR are interactive and engaging, which increases a trainee's encouragement and motivation.

Among industrial verticals, training is most prevalent in manufacturing and logistics. Both realize especially high value through XR training thanks to complex workflows and environments, high downtime costs, and importance of knowledge share.

AR Smart Glasses Usage Training

(Source: ABI Research)
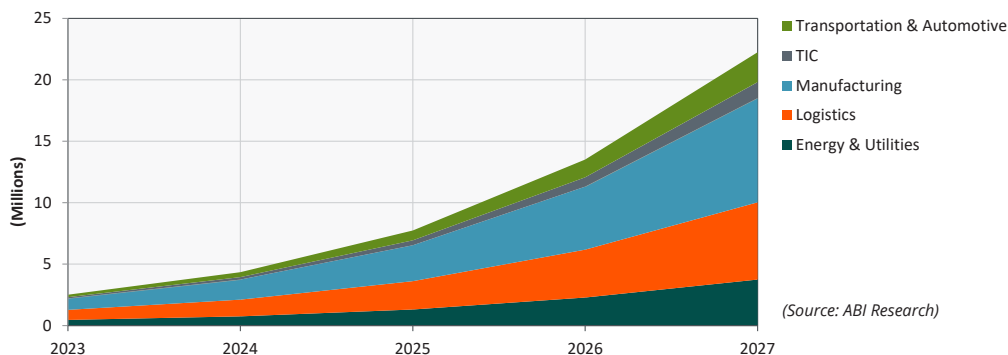
KEY BENEFITS

Industrial workflows tend to favor hard skills where training is most valuable. XR is well suited to hard skill training thanks to interactivity and immersive visuals, especially VR. Knowledge capture is equally important to training—real-time capture with AR and later training with AR and/or VR can maximize value. XR training is proven both upstream and downstream. Bundling product training with an installation is increasingly popular.

Benefits include:

EFFICACY, RETENTION, AND RECALL

- Humans are visual and hands-on learners most commonly

- Better trainee experience, both in efficacy and engagement with content. One-week retention rate can top 90% with VR, versus 75% average for traditional learning (Source: University of Maryland)

USAGE FLEXIBILITY

- Enabling off-site training to save on travel costs and time

- Enabling in situ (real-time) training for instant ramp-up

- More flexibility in training time and location, improving worker experience
Hop in/hop out when necessary

SAFETY

- Off-site training for hazardous environments

- Familiarity with environments through interaction and spatial visualization

- Training for unexpected events, such as emergency situations, is infinitely repeatable and scalable

CUSTOMIZATION

- Digital environments and workflows can tailor to any training need, even down to specific users

- Content is easily created and customized with common tools (e.g., Unity) and plugins. Existing content can be reused (CAD, 3D models)

- Leveraging existing platforms (PLM, IoT, device management, etc.) in training content, either real time or preloaded, enhances value of not only the XR solutions, but also other integration solutions

METRICS AND REPEATABILITY

- Valuable data collected—location, heatmaps, interaction areas, success/failure, time to complete

- Integration of training content and outcomes into digital platforms enables better and more powerful knowledge sharing capabilities

- Significant cost savings around training content creation and distribution. Create content once, train infinite times