Transforming Training for the Deskless Workforce with AR-enabled Work Instructions

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To operate safely, efficiently, and productively, organizations reliant on a deskless workforce must ensure they have robust learning and development plans and capabilities in place to ensure their employees are adequately trained. Employee skill sets must remain up to date and at a level to do their jobs competently. Yet, challenges abound. Equipment, vehicles, systems, and workplaces are growing in complexity. Traditional training approaches fail to keep up with the pace of change while a skills gap often develops within in many workplaces as experienced workers retire, and younger employees enter the workforce less equipped. AR-enabled work instructions offer a flexible and modern tool for implementing an agile and effective training system and methodology to ensure workforce proficiency.

Deskless Workers Require More Training

Often working in hazardous and regulated environments with complicated machines and systems, deskless workers must acquire specialized skills and knowledge including technical skills, safety protocols, equipment operation & other job-specific competencies to perform their tasks safely, effectively, and efficiently. So, training has long been essential to enable organizations to achieve their desired efficiency, growth, and ultimate overall success. But current macro trends in the global labor market are demanding a better, more efficient approach to training that will transfer knowledge faster and help decrease the time to productivity for all workers. Some of the bigger trends include:

A Workforce Transformation

Organizations are faced with an aging workforce and are losing key subject matter experts to retirement. Often these workers have specialized knowledge that has taken decades to be developed and acquired. When they leave, their expertise is lost forever. This creates two significant challenges – a decrease or lack of competent workers and an increased burden on the remaining experienced workers to become the primary "trainers" for new employees. And even with mentoring and assistance, the less experienced workers are slower to ramp up their productivity and are inherently less efficient and productive until they gain competency.

A Skills Gap

Exacerbating this skills gap is the growing complexity of operating and maintaining equipment. Technical innovation promises increased productivity but typically requires workers to be proficient on increasingly complicated technology, systems, and machines. And businesses pressures often lead to extending the useful life of existing machines and vehicles requiring workers to have the skills to operate and maintain a rainbow of different equipment to perform their jobs successfully. Further, many organizations have had to increase the number of products and SKUs produced and maintained to stay competitive – requiring workers to understand an even larger number of operational procedures.

Persistent Pursuit of Efficiency

The business environment continues to pressure many organizations to deliver more while minimizing expenses. Doing more with less - -the concept of efficiency - is often emphasized in business management and operations as it allows companies to increase their profitability, competitiveness, and sustainability by making the most effective use of their available resources. For the deskless workforce, this often means less employees which demands maximizing productivity from every worker - requiring them to be skilled and proficient on more equipment and procedures.

Employee Engagement and Retention

So, with a potentially smaller workforce and likely a less experienced workforce, organizations are reliant on a strong employee engagement and retention strategy. They need systems to build skills and solutions to retain skilled employees. Younger workers want to be engaged with the latest tools and technology. Many want to learn new skills and build a path for long term career development and success. Workers at all levels want to develop the skills required to help them master their current and future jobs so they tend to value access to training and are likely to matriculate less if they have access to engaging and interesting training opportunities.

Deskless Workforces Need More Effective Training

More training is needed but training the deskless workforce is fraught with challenges. And traditional methods are not keeping pace with both the rate of demand and rate of change. Embracing modern tools will be the only way to help workers gain more skills quickly, safely, and effectively. Some of the common challenges include:

Inefficient Classrooms

Many organizations still use a very traditional approach with an instructor and a classroom. Instructor availability, a dispersed workforce, and the ability to realistically simulate work environments limit this approach. Furthermore, students want to learn at their speed, based on their experience level. And lots of data suggests a more hands-on methodology - one that emphasizes doing and learning vs attending and listening - drives higher comprehension & retention rates.

Insufficient Training Time and Hands-on Experience

Industrial training programs are often limited in time for a variety of reasons, which can make it difficult for students to absorb all the necessary information and skills. Also, many training programs may not provide enough practical training, which can limit the student's exposure to real-world

Outdated Equipment and Technology

Some industrial training programs may use outdated equipment and technology because up-to-date equipment needs to stay in production. The result is training may not reflect current industry practices or standards and training may not occur with the machines that workers will use in their jobs.

Safety Concerns

Industrial training can involve exposure to dangerous environments and equipment, which can pose safety risks for the trainees so access and time in these environments are limited, and training is reliant on simulation and theoretical approaches.

Communication Barriers

Training may require working with people from different backgrounds, which can create language and cultural barriers that can impede learning.

Inadequate Evaluation

Training programs may not provide adequate evaluation methods to assess trainees' progress and performance on a timely basis, which can make it challenging to identify areas for immediate and ongoing improvement. Training may tend to be episodic as well and not provide ongoing and regular assessments frequently enough.

Inefficient and Inconsistent 1:1 Mentoring & Job-shadowing

This approach can work well but is challenging when there are limited subject matter experts (SMEs) available. It can also be slower and decrease the productivity of the SMEs which can significantly impact a business (especially in an environment where turnover is high and regular onboarding and training is required). Training also tends to be less standardized and can be very inconsistent across different SMEs.

AR-Enabled Work Instructions Provide an Agile Training Tool

Augmented training, based on AR-enabled work instructions, will fundamentally change training for the deskless workforce while driving efficiency, consistency, and effectiveness for organization. This methodology promotes a self-led, personalized, hands-on training experience that increases comprehension and retention and lowers time to competence. And it can be done virtually anywhere including in an industrial work environment, in the field and other remote locations, or within a safe, non-hazardous, and out of the way location. It provides many enhancements and improvements over traditional training methods in many meaningful ways including:

Just-in-Time Training

Training no longer needs to be aligned with a schedule dictated by the trainer or equipment availability or as part of a structured calendar. Students can follow instructions and learn when they need to – before operating a new machine or when preparing to complete a procedure infrequently used. Training can occur much more frequently until a student becomes confident or much less frequently when students only need a refresher.

Personalized but Consistent Learning:

Standardized instruction and guidance can be developed for specific procedures, equipment, and protocols but individual students can follow at their own pace. Detailed context and content can be used to augment instructions, but students can selectively choose to review based on their individual experience. Dynamic workflows can be followed based on specific student selections and other personalized criteria such as roles and familiarity of equipment.

Enhanced Hands-on Training

Leveraging AR, training material can be spatially anchored over real-world equipment or virtually over 3D models and digital twins. Either way, students learn by following step-by-step directions that require hands-on actions including submitting completion evidence that can be assessed for accuracy or completeness. Learning is done by doing a job or procedure as opposed to reading or watching how it is done.

Relevant and Accurate Training Material

Using AR-enabled work instructions as a platform training presents an opportunity to leverage internal SME and "tribal knowledge" to create training material that reflects reality. Experts can be filmed doing work. Their knowledge, often developed over years or decades, provides a superior approach relative to instruction manuals and formal SOPs. Capture and document how work is actually done successfully and efficiently and then use that as a baseline to develop training procedures.

Virtual Access to Machines and Equipment

Augmented training can provide hands-on experience without the need for actual equipment or machines, which can reduce costs and safety risks while improving the learning experience. It can also expedite training by eliminating a reliance on availability of machines (which could also minimize downtime and disruption to operations from training).

Immersive and More Realistic Simulations

Augmented training can create realistic and immersive simulations that can simulate complex industrial environments, scenarios, and procedures that may not be possible in traditional training environments, giving students practical experience in a safe and controlled environment.

Real-time Feedback

Augmented training can provide real-time feedback to trainees in many ways. Feedback can be provided based on the results of a previous step, an answer to a question, real-time IoT data, hypothetical conditions, or even remote instructor assistance. This data and guidance can help identify areas for improvement and enable immediate corrective action, enabling trainees to adjust their approach and improve their skills on the spot.

Remote Training

The flexibility of virtual machines and remote collaboration capabilities means that training can occur anywhere in the world without the need for physical travel, reducing costs, increasing accessibility and availability.
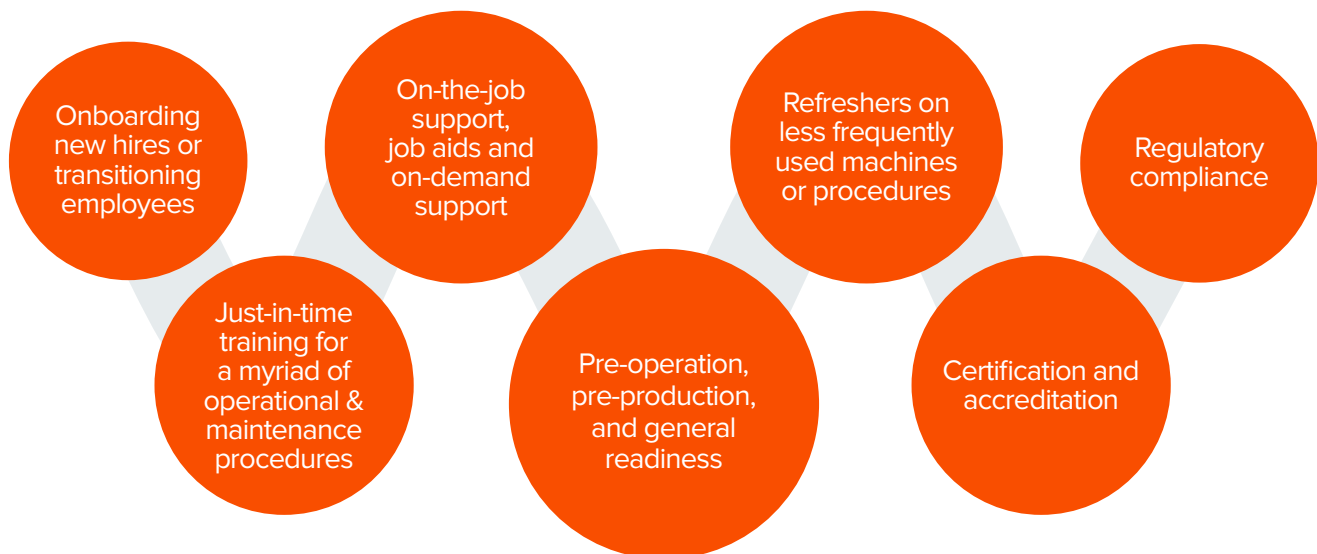
These attributes combine to make training safer, more cost-effective, quicker, and more effective. Augmented training can provide a safe environment for trainees to practice industrial skills without putting themselves or others at risk. It can reduce the costs associated with traditional industrial training programs, as it eliminates the need for expensive physical equipment and materials as well as travel. Providing a more efficient and effective learning experience enables trainees to acquire the necessary skills in less time. And the hands-on nature of augmented training tends to increase the retention of these skills over time relative to traditional methods.

Training Anytime and Anywhere Supports a Culture of Continuous Improvement

A good training program plays a crucial role in supporting a culture of continuous improvement within any organization. It provides employees with the knowledge, skills, and resources necessary to enhance their performance, grow their abilities, and contribute to the overall improvement of the company. Augmented training further enables this culture by making training content more readily available any time or anywhere it is needed.

It provides the basis for organizations to move away from approaching training and development as a series of unconnected, point events and rather offer it as an ever-present, flexible continuum that can be used as often as workers desire.

Augmented training can also be leveraged in many ways to support the organization including:

Onboarding new hires or transitioning employees

On-the-job support, job aids and on-demand support

Refreshers on less frequently used machines or procedures

Regulatory compliance

Just-in-time training for a myriad of operational & maintenance procedures

Pre-operation, pre-production, and general readiness

Certification and accreditation

Effective and Flexible Training made easy with the Manifest Solution

Manifest is the leading augmented reality (AR) work instructions solution that helps capture knowledge to train your deskless workforce and help them perform procedural tasks flawlessly, wherever they may be. Manfiest can be used for both an effective training tool as well as an on-the-job aid to help workers perform their jobs consistently and error-free. Companies around the world and in a variety of industries leverage Manifest to capture their tribal knowledge and expertise, create digitized training material and drive skill acquisition for less experienced workers to ultimately decrease their onboarding and training times and speed time to competence.

Manifest has and can been used to train workers on a diverse set of equipment, vehicles and procedures including those outlined below:

Functional Area	Procedural Examples
Inspections and Quality Assurance	Safety inspections Pre-operation of machine and vehicles inspections Regulatory audits Quality control Preventative maintenance inspections Process for efficiency auditing End of line (discrete mfging) part inspection Compliance audits (internal, industry standards, regulatory)
Maintenance and Repair	Preventative and condition-based MRO Corrective or break/fix Scheduled and phased Predictive Flight-line
Operations	Broad uses from assembly to production Commissioning/decommissioning
Safety and Certification	Safe machine and equipment operation Hazardous material handling Emergency response protocols Compliance data collection

Manifest can support a wide variety of training uses due to its flexible architecture and ease of use. Its unique set of capabilities make it a flexible, user-friendly, and engaging solution.

Easy to Deploy and Manage

Manifest is a SAAS solution that doesn't require any local infrastructure or resources beyond internet connectivity. Deploying and maintaining it for an organization is quick and straightforward. Manifest is cloud agnostic - it is optimized for Microsoft's Azure but can be deployed and used in other public, private and hybrid clouds including those with advanced 5G edge components. A Docker option is available to deploy fully on-premise for secure use in protected environments. And it can also be used fully offline when training needs to occur in disconnected locations.

Supports the Devices Widely in Use Today

Manifest's support for a broad set of devices is key to helping workers get their jobs done efficiently. It runs on devices already in use and already familiar to the workforce as well as on many of the most innovative, leading-edge AR devices. As such, Manifest supports the latest head mounted devices, tablets, phones, and PCs. And Manifest content is adaptive to each device type. So, training material can be created once and used everywhere, and content fidelity will automatically adjust depending on specific device type.

Flexible, Simple Knowledge Capture & Content Creation

Manifest's simple interface for creating and maintaining training material doesn't require any programming or special skills — even when creating specialized AR and spatially anchored content. Capturing expertise and documenting procedures for training can be as easy as videoing an expert performing a job and transforming that video into step-by-step instructions. Digitized manuals, media, SOPs, and other existing documentation can be leveraged to enhance training procedures.

And content is modular to customize, personalize, and facilitate updates and iteration and support micro-learning. Reuse is common. Build once and use it on different devices, at different locations and an unlimited number of times. It's always available to be used as an on-the-job aids even when training is completed. At the same time, user-access can be managed ensuring the right content is consumed by the right set of learners & it is consumed in a specific order.

Engaging, Immersive and Personalized

Manifest presents an immersive and engaging training experience that can be personalized for individual learners. Younger workers value its innovative technology that exposes them to the next compute platform while older workers embrace the familiarity of its interface when running on devices they may already be using at work or at home such as the iPad. The hands-on approach helps workers learn by doing.

Manifest's step-by-step instructions provide a structured approach that enables consistency in training and process across individuals, teams, and locations. It can provide real-time feedback after every step and ensures that steps are followed in the right order and completed before trainees can progress.

Manifest's flexible AR capabilities embedded in all training material can be overlayed on top of real-world equipment or virtual machines when equipment is not available or unsafe to use. Support for 3D animated models and spatially anchored content help trainees comprehend the most technically challenging procedures and training content. Animated models might show an assembly or disassembly sequence while spatially anchored content could direct workers to very specific locations on equipment or in workplaces to complete training.

Integrated Remote Spatial Collaboration

Built into Manifest is a set of collaboration and communication capabilities that enable advanced remote collaboration. Video and text chats provide the fundamentals but features like sharing see-what-I-see videos, real-time AR annotation, and holographic, "wayfinding" directional arrows unlock new ways to train, mentor, and guide. SMEs can provide ad-hoc or scheduled 1:1 mentoring without being physically in the same spot as a trainee.

They could also provide feedback on a student's work or progress and suggest corrective actions or identify areas for improvement and specific training modules to review — all in real-time rather than in more formal structured, scheduled, and slow traditional ways.

Training becomes more agile, more immediate, and more efficient while minimizing reliance on experts and eliminating travel costs and constraints.

Transforming Learning and Development for the Deskless Workforce with AR

AR-work instructions are a modern training tool that will transform how deskless workers learn. Just-in-time, immersive, engaging, hands-on, and personalized, this new approach makes training more agile, interesting, and effective. Augmented training is a crucial investment for organizations that addresses many of the common challenges with training the deskless workforce and can significantly transform learning and change the impact of training programs in meaningful ways.

Here are some of the positive changes expected after implementing an augmented training program.

Training Metric	Impact from Incorporating AR in Training Programs
Training Completion Rate	Completion rates increase as trainees are more engaged by the immersive AR experience, hands-on approach, and personalized content. Younger, less experience workers that often need more training gravitate to AR and innovative tech and increase their commitment to training.
Knowledge and Skills Acquisition	Acquisition rates increase and at a faster pace as learning by doing outperforms traditional methods. Real-time feedback, personalized approach, and superior 3D and AR content drive higher comprehension and retention.
Performance improvement	Personalized content, just-in-time training, and continued on-the-job guidance helps workers do their jobs better resulting in higher performance ratings.
Time to Competence	Workers become proficient much faster. Training can focus on the specific equipment, jobs, and procedures with which they are tasks. Training is immediate and hands-on. And workers can learn while they are performing a procedure.
Compliance and Safety	Higher compliance rates and fewer incident reports are achieved when safety protocols can be reviewed within a work environment, at a specific machine, just before a piece of equipment is used, and a procedure is performed. Spatially anchored content can be used to specifically point out safety risks to operators before using equipment.
Employee Retention and Turnover	Retention is increased as employees perform at higher levels due to better, more engaging training and on-the-job aids.

More Resources to Explore

To learn a little more about augmented reality training for deskless workers

- Augmented Reality Training for Advanced Manufacturing
- Augmented Reality ROI for Manufacturing Machine Operator Training
- Augmented Reality in Hands on Learning Environment
- Pharma Laboratory Augmented Reality Safety Training with HoloLens
- Pharma Laboratory Training with Augmented Reality using Manifest, Magic Leap, & HoloLens
- Industrial Equipment Training and Demonstration with Augmented Reality
- Augmented Reality Training Software for Industrial Machine Maintenance
- US Navy Shipboard Maintenance and Training with Manifest Augmented Reality Software
- Boeing 737 Pilot Training with Augmented Reality

To learn a little more about AR-enabled work instructions:

- Exploring Augmented Reality Digital Work Instructions
- Building Great AR-enabled Work Instructions
- Assessing the State of your Digitized Procedures and Work Instructions
- Why iPads are a Great Choice for Scaling AR-enabled Work Instructions
- How to Design a Successful Augmented Reality Work Instructions Pilot Program

About Taqtile

The job is our job. Everything we do, every product or technological innovation we make, exists to empower, and equip people with the tools they need to complete their job flawlessly, accurately, and to completion every time.

We create the tools of tomorrow to improve processes and workflows, train the next generation of hands-on workers, & eliminate the barriers between machine and operator, location, and time.

We don't spend time contemplating what the future might look like: the future of the deskless workforce is already here. We're just putting the right tools into the hands of those who truly benefit from them.

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