

Live-Streamed Instructor-Led Remote Augmented Reality Training Demonstration

Project Summary
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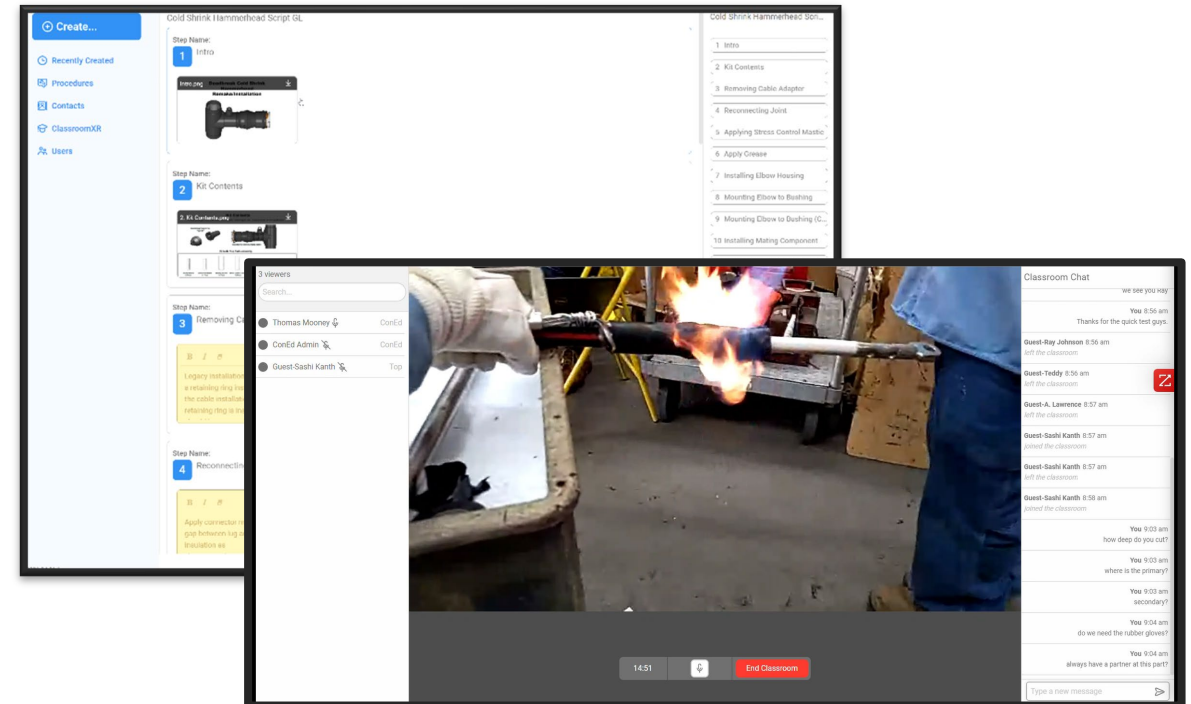


Company Overview



Design Interactive is a woman-owned small business specializing in augmented and virtual reality training and operations software. **For more than 20 years**, DI has provided human performance research and training system development for industrial customers and various agencies across the Department of Defense.

DI's flagship product, **XR Mentor™ is an instructor led and self-guided SaaS training platform, enhanced by augmented reality.** XR Mentor™ is ideal for meeting today's post-COVID training and operational challenges and is available on the HoloLens 2, Android, iOS, and web platforms.



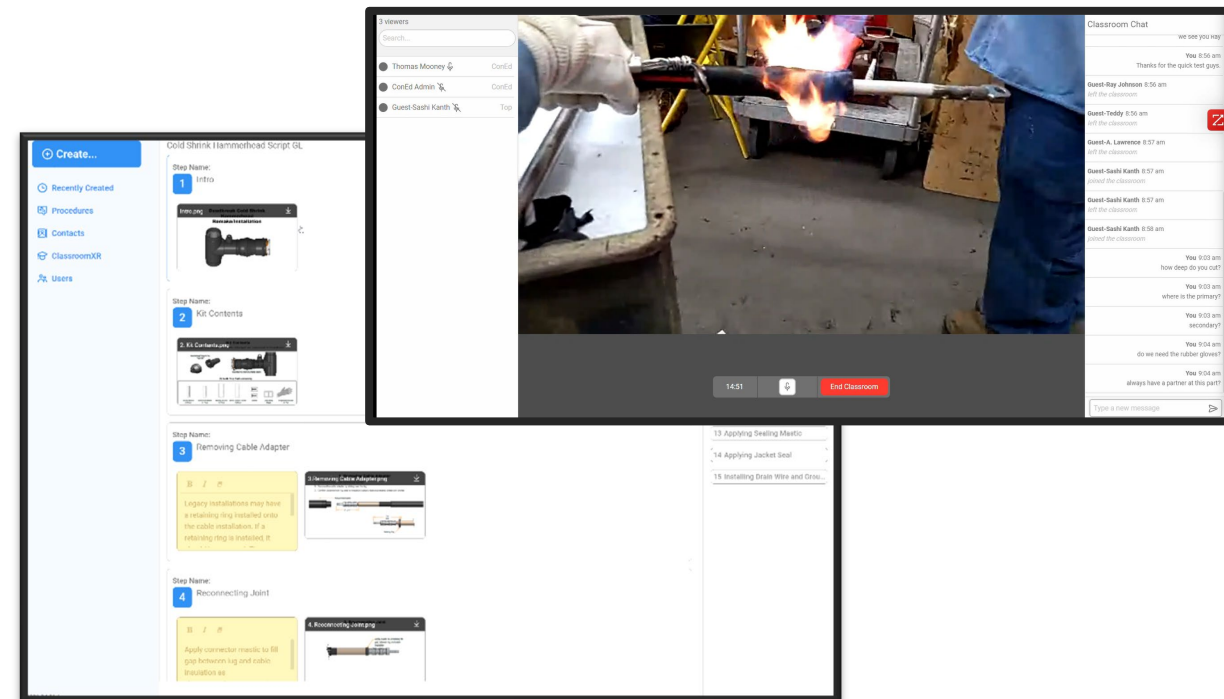
About the Opportunity

1. Limited ability to train live in large groups (cost, COVID)
2. Video conferencing lacks engagement with content
3. Integrating webcams and other camera solutions is difficult
4. Hard to provide proper point of view (i.e., first person)

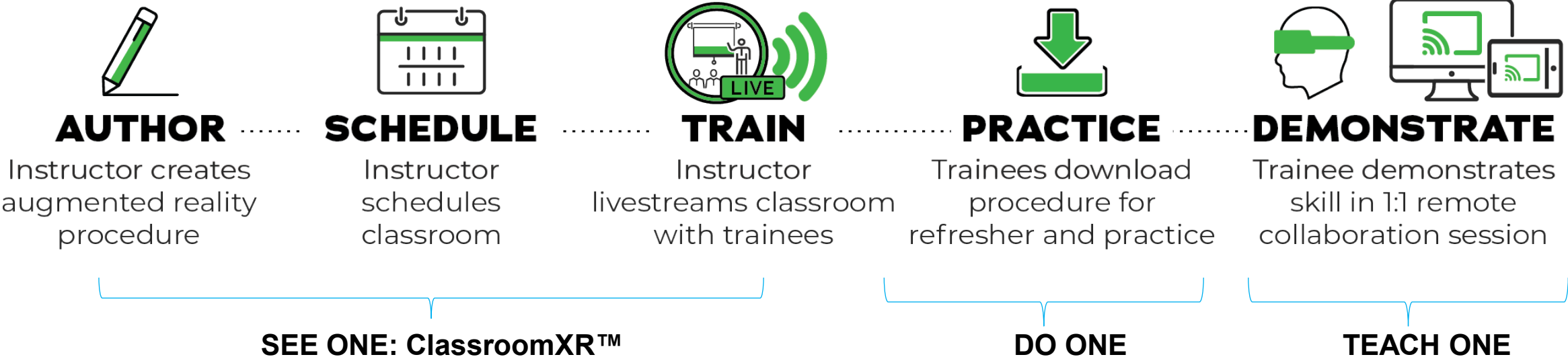
What is the need?

1. Reduce time to create new training
2. Reduce travel time by moving knowledge not students
3. Rapidly deploy instructor led training at scale

Con Edison used DI's XR Mentor™ platform to create a training module and remotely deliver it to underground distribution network splicers and field mechanics by live streaming a first-person perspective from the Microsoft HoloLens 2.



Instructor Led and Self-Guided Training Platform enhanced by augmented reality



Provides step by step guidance to technicians and on demand video collaboration with experts

About the Technology – ClassroomXR™

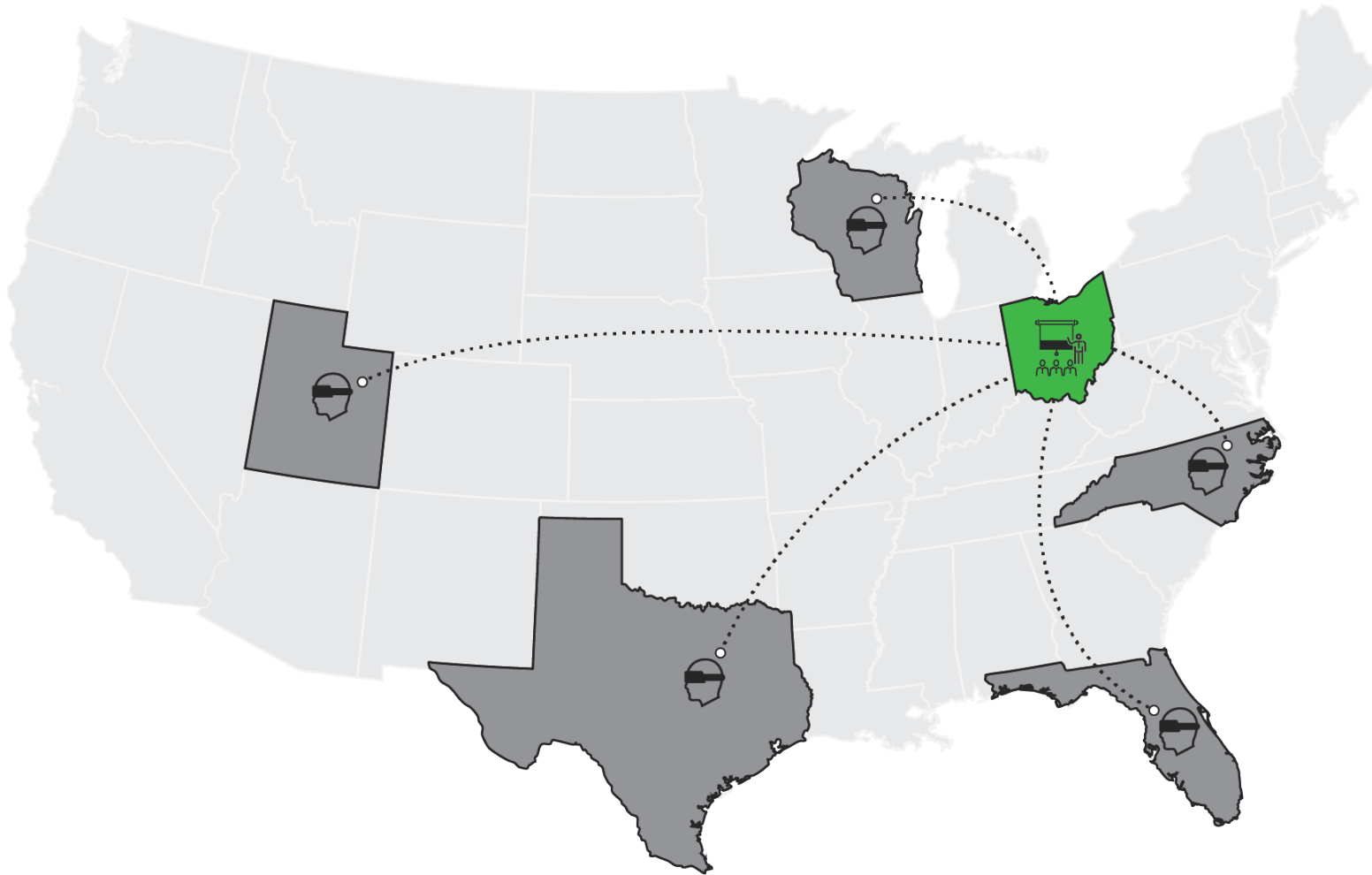
Live-streamed instructor-led training enhanced by Augmented Reality

1. Instructor live-streams AR enhanced lesson from HoloLens 2 (HL2) to a website
2. Remote Trainees observe live from Chrome browser
3. Remote Trainees chat in real time with instructor
4. Video can be saved for refresher training

The screenshot displays the ClassroomXR interface. On the left, a sidebar shows a list of viewers: Thomas Mooney (ConEd), ConEd Admin (ConEd), and Guest-Sashi Kanth (Top). A search bar is at the top of this sidebar. The main area is a live video stream of a welding process, with a blue circle labeled '1' indicating the live stream. On the right, a 'Classroom Chat' window shows a list of messages, with a blue circle labeled '3' indicating the chat. At the bottom of the video stream, there is a timestamp '14:51', a download icon, and a red button labeled 'End Classroom'. The chat window has a text input field at the bottom labeled 'Type a new message' and a send button.

Why start with ClassroomXR™?

Addresses workforce training challenges exacerbated by COVID-19



- Instructor in central location, trainees in remote locations
- Livestream from to **ALL TRAINEES AT ONCE**
- First person perspective allows all trainees see a viewpoint they can't get in an in-person class
- Only one headset (HoloLens 2) required, and trainees watch from remote location on existing devices
- Train a handful of instructors to use the software, not an entire workforce

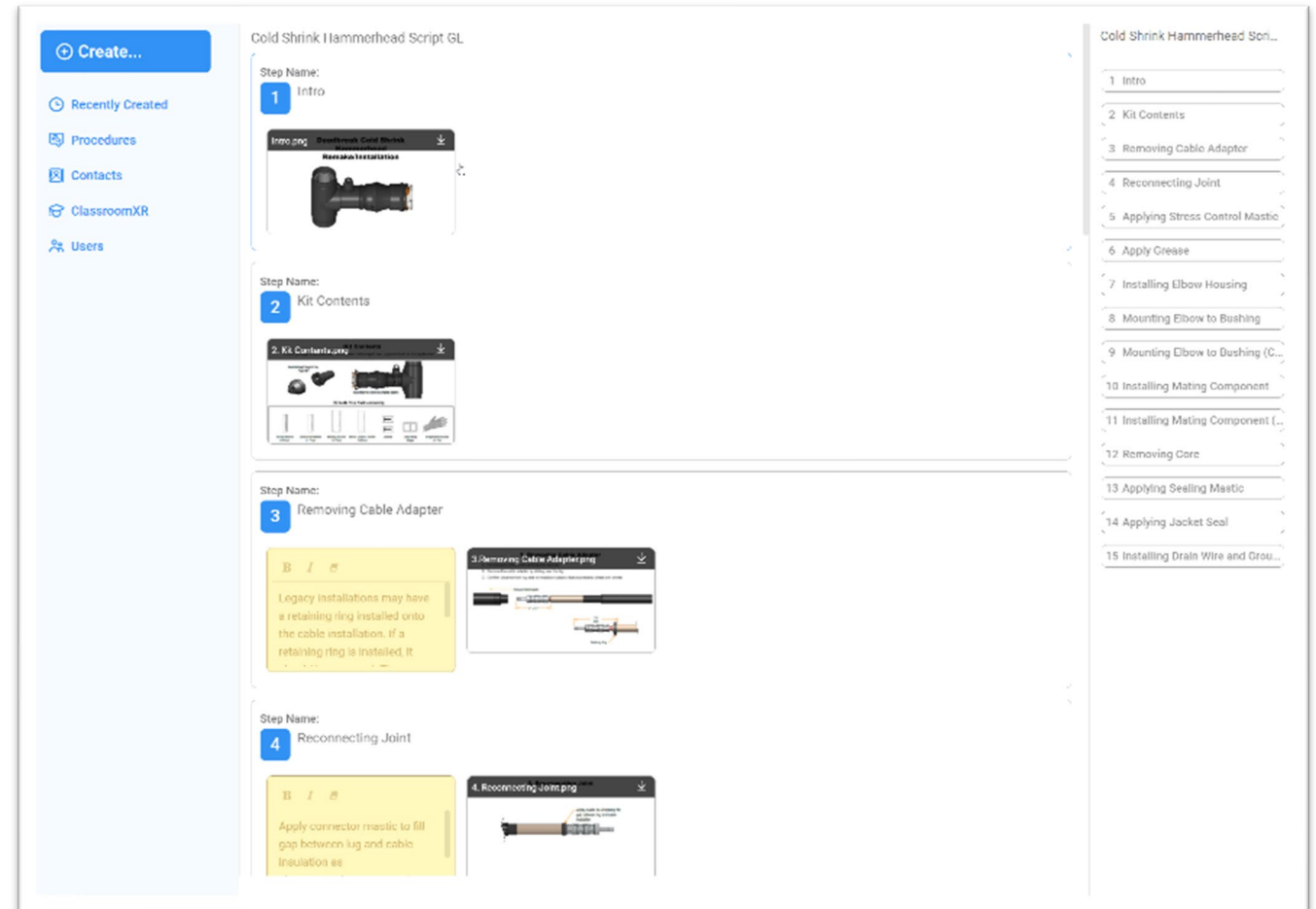
How is training content created?

Training modules are created at an easy-to-use website.

- Instructors can create stepwise procedures from scratch or use existing materials like:
- PowerPoint slides
- Videos
- Pictures
- 3D CAD models

No special skills required. The software was inspired by basic features of commonly used computer programs.

“If you can attach files to an email, you have all the skill you need...”



Project Objectives

Exploring a new software tool to make training & education for a hands on experience have greater efficacy for learners

1. Assess the efficacy of **XR Mentor™** in a practical demonstration as asset to make hands on experience learning a positive activity
2. Assess the cost of using the **XR Mentor™** platform in lieu of conventional training methods
3. Survey project participants on the quality of the learning engagement and experience

Project Scope

Product Training

DI provides train the trainer training to ConEd personnel and implements on/around IT network

- 2 day onsite workshop on HoloLens 2 basics and content authoring
- Provide best practices and create an instructor led module
- Practice live streaming and continuous improvement of training module

Demonstration

ConEdison runs a live, 1 hour training session with remote trainees using a MiFi off network

- 2 instructors run a live stream from Microsoft HoloLens 2
- 16 remote trainees join classroom from windows 10 device
- Train hammerhead cold shrink process

Evaluation

Team gathers feedback from administration, instructors and trainees on user experience.

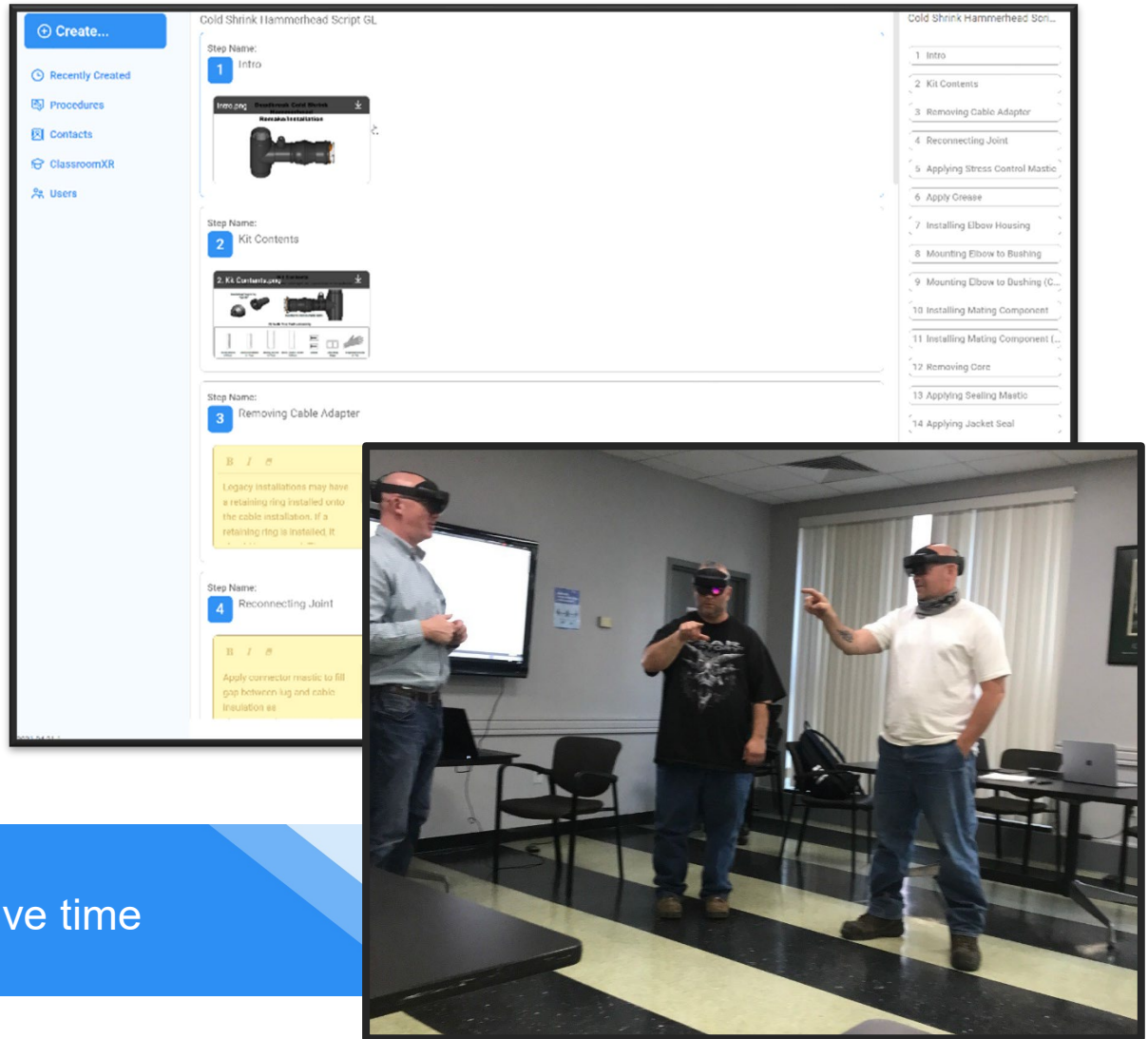
- ConEd admin/leadership gathers easy of use information from instructors
- ConEd admin/leadership gathers subjective evaluation on learning experience from trainees
- Team evaluates cost of adoption compared to traditional training methods

Note: XRMentor™ is cloud based. This demonstration was conducted using MiFi. The XRMentor™ software was not accessed through ConEdison's IT network. It is highly recommended that IT staff for prospective customers are engaged early in any project and onboard process.

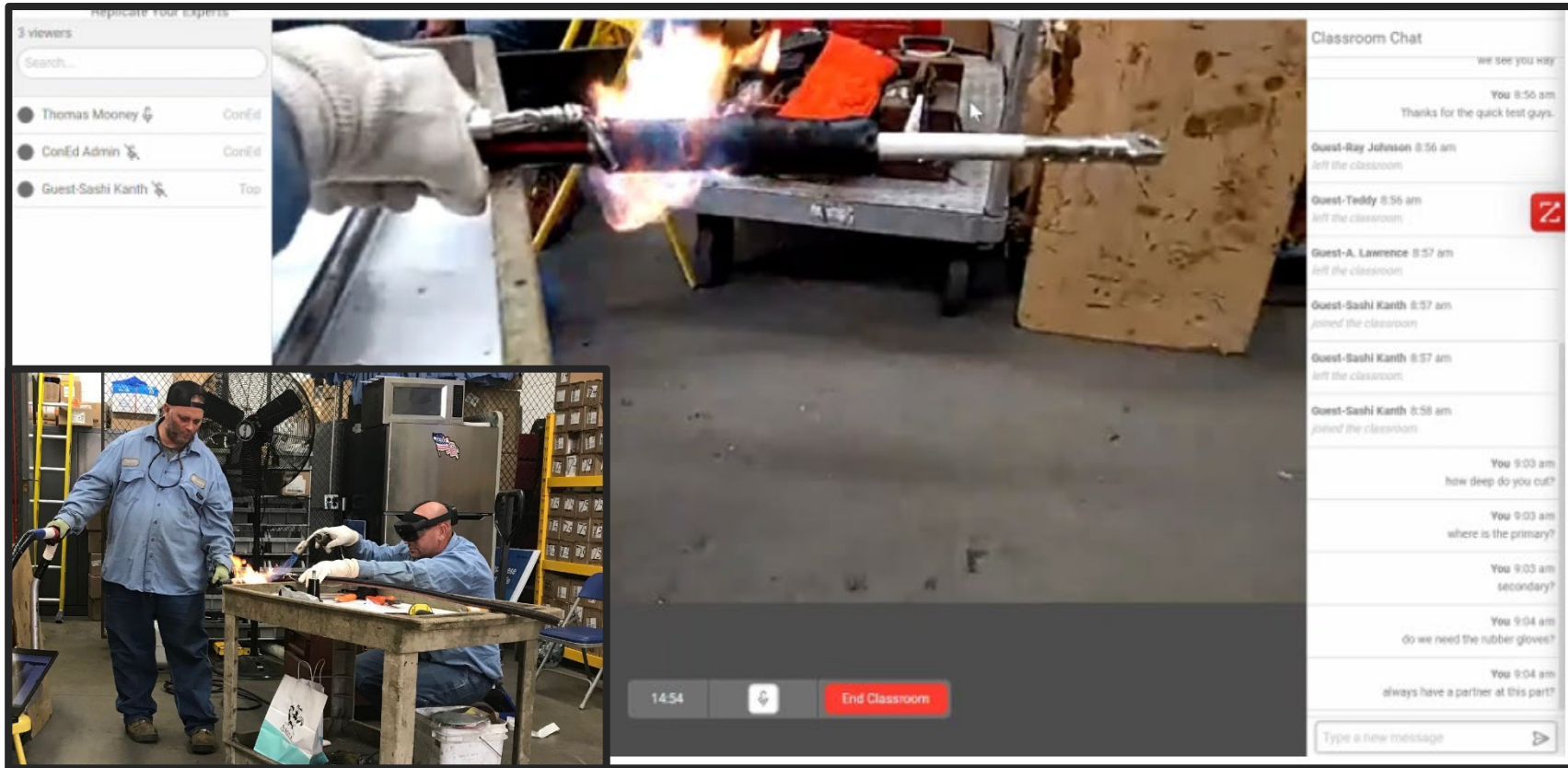
Practical Demonstration – Creating Training Modules

- ✓ Instructors received 1.5 days of “train the trainer”, learning to create training modules at XRMentor™ website
- ✓ Received best practice guidance and 1 on 1 sessions with implementation manager weekly
- ✓ Collaborated on a lesson plan and determined required content for training module and tested use of notes, pictures and 3D models
- ✓ XRMentor™ platform determined to be very easy to use

Instructors were able to learn to create training content using XRMentor™ and live stream in less than 2 weeks of cumulative time



Practical Demonstration – Live Streaming



- ✓ Demonstration was performed off corporate network
- ✓ Instructors able to live stream from HoloLens after less than 2 days of hands-on training
- ✓ Live streamed a 1 hour training class to ~16 remote trainees through the XR Mentor™ platform
- ✓ Successfully sent chat messages and interacted with the instructor

Instructors with no prior experience were proficient at live streaming within 1 day of introduction to the platform

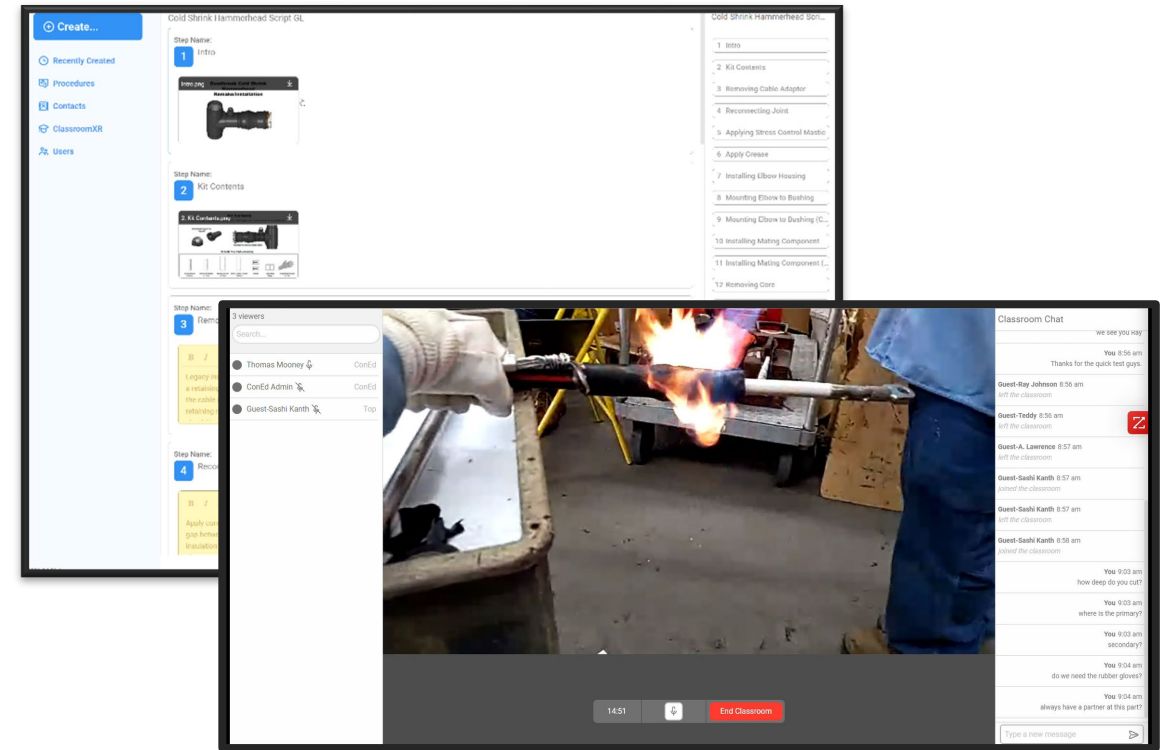
Cost Considerations

Considerations in Creating Content and Using XRMentor™

- ✓ Industry standard is it takes 40-50 hours for an instructional designer to create 1 hour of traditional, stand-up instructor led training
- ✓ It took ConEd utility employees (not instruction experts), 40 hours to create training and approximately another 40 to be proficient in live streaming training
- ✓ Instructor led feature requires no end user training for trainees
- ✓ Consider the time and cost of IT personnel to enable streaming on corporate networks

How does licensing work and what hardware is required?

- ✓ Annual license for software
- ✓ Price dependent on number of end users
- ✓ Require 1 HoloLens 2, recommend 2



Utility employees able to create 1 hour of training in same amount of time it takes expert instructional designers

Lessons Learned and Conclusions

▪ Lessons Learned

- ✓ Utility workers can learn to use XRMentor™ and become proficient instructors in 40-80 hours
- ✓ Learning curve is steep but short
- ✓ Does not require expert instructors or instructional systems designers to get value
- ✓ Important to include IT department early to address network and cybersecurity requirements

▪ Next Steps

- ✓ Considered for use by GridEd
- ✓ Recommend running an on network test with ConEdison

▪ Conclusions

- ✓ XRMentor™ and augmented reality have great efficacy for remote learning
 - ✓ Trainees are satisfied with the delivery method
 - ✓ First person perspective provides great value compared to 3rd person video
 - ✓ Promises to increase trainee throughput as instructor led training can be performed at scale
- ✓ Involve IT early as ConEdison was unable to test the software on network

Recommendations: Utility companies should explore the use of XRMentor™ to reduce cost of instructor led training and to increase throughput

Frequently Asked Questions

1. How long does it take to create 1 hour of instructor led training? It takes approximately 40 hours for an untrained user to become proficient and create 1 hour of training, which is similar to traditional training methods.
2. Are any special skills required to create augmented reality training? No. XRMentor™ includes an easy to use authoring website that requires no coding, no past experience with training software.
3. How long does it take to learn to use the HoloLens 2? The HoloLens comes with a 10-15 minute self guided instruction. DI offers a 2 day, train the trainer class that includes HL2 instruction. A new user, with practice, will be proficient in less than a week.
4. What services does DI provide to help us get started? Every license includes a 2 day train the trainer event. We also perform goal setting exercises, create content or help create training modules, run training events, analyze ROI and roadmap future feature adoption. We will customize the onboarding process to your needs.
5. Do I need to download XRMentor™ on my computer? No. XRMentor's authoring website resides in the cloud along with all data and content you create. The XRMentor™ application is also available in Google Marketplace and the Apple AppStore, along with Microsoft's marketplace on the HoloLens.
6. Does XRMentor™ include single sign on and multifactor authentication? Yes. And we will work with your IT department to onboard and test integration with your authentication standards.
7. Does XRMentor™ include data storage? Yes. Data storage for training modules including photos, videos, CAD models and other content you add and create is included in the annual license?
8. How does pricing work? XRMentor™ is sold as an annual license and the price depends on the number of end users. End users are any user with a log in and includes instructors and trainees.
9. Is the HoloLens the only device XRMentor™ is on? No. XRMentor™'s self guided procedures, remote collaboration and authoring features are also available in the web and on iOS and Android devices. You only need a HoloLens to live stream instructor led training. Monitor our website and social media as we add more hardware devices.
10. Why is it important to involve my IT department? XRMentor™ is cloudbased and supports livestreaming of video content. Some IT networks throttle or even prevent this content from passing between devices to prevent misuse or for security reasons. Further, like any software application, the IT department likely must approve it for use and make sure it meets basic cybersecurity requirements.

How to Contact the Team



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