AT A GLANCE

WHAT IS IT?
A web-based immersive content creation and training delivery tool that can be used on any device from any location and does not require specialized AR/VR equipment, software, or skills to generate or access training content.

HOW DOES IT WORK?
Leverages QSI’s unique sustainment and maintenance Digital Twin to enable the creation of comprehensive training scenarios based on inherent system cause-effect relationships that more accurately represent actual system behavior and resemble real-world troubleshooting experiences.

For students: Guides learners in isolating and correcting the root causes of system failure, combining just-in-time, just-in-place on-the-job training with a set of immersive experiences and a continuously improvable content authoring pipeline.

For instructors: Streamlines the creation of effective immersive training content while balancing content generation with instructor expertise to ensure optimal training.

Will integrate with USMC Learning Management Systems (LMS) and Learning Record Stores (LRS) to provide the means to structure learning curriculum for students and provide standardized measurement of learning metrics.

WHAT WILL IT ACCOMPLISH?
Increases training completion rates and improves building and sustainment of necessary KSAs. The results? Fewer technicians performing a wider variety of maintenance tasks, saving time and reducing task errors.

OBJECTIVE:
Develop an enterprise maintenance training framework that employs Digital Twin-enabled immersive content, combined with intelligent guided troubleshooting and training, to provide Marine Corps students and field maintainers with up-to-date operational maintenance and training.

RESEARCH CHALLENGES AND OPPORTUNITIES:
- Address Marine Corps Deliberate-Urgent Needs Statement (D-UNS) for “Enterprise Level Maintenance Simulation Training Simulator”
- Develop tools to support operational maintenance and training
- Build a content creation pipeline to convert legacy content into 3D content
- Deliver immersive training accessible over a network
- Ensure training is available in a variety of modalities (laptops, tablets, smartphones)
- Incorporate an efficient and continuous improvement process through capture of operational maintenance data and technician feedback to improve schoolhouse training
- Provide maintenance training that is adaptive to the knowledge, skills, and abilities (KSAs) of maintenance trainees

Maintenance Operations and Training is an integral part of life-cycle management of the Department of Defense’s (DoD) fleet of equipment. However, marine maintainers currently lack access to modern training capabilities that provide up-to-date knowledge and expertise to successfully maintain systems and outsourcing training content generation is expensive and time-consuming. There is also a need to centralize management of maintenance training devices and simulations, so schoolhouses and other training venues do not have to seek information from various program offices and outside sources to find updated technical information and equipment on which to train.

Qualtech Systems, Inc. is addressing these challenges with MTOT, a web-based immersive content creation and training delivery tool that seamlessly bridges the gap between training environments and field maintenance operations. MTOT uses QSI’s reasoner-guided AR to achieve the DoD’s strategic goal of training technicians to be more efficient maintainers. MTOT generates adaptive training content (in LMS such as Moodle) that adjusts training content to student performance. MTOT incorporates learning standards (such as xAPI) to log analytics of student learning exercises to LRS, thus providing a standardized set of learning metrics and visualization capabilities. MTOT supports distributed and distant learning via on-demand shareable web-content.

When complete, MTOT’s will ensure students are taught up-to-date technical information on up-to-date equipment, better preparing them for field maintenance operations and improving overall DoD maintenance training effectiveness.