Evolving tactical and logistical operations for U.S. military and civilian agencies with MaEVA

By Steven Toth

Technology is a force multiplier, but technology is also disruptive. Federal agencies spanning the military branches and the civilian sector know this all too well, as the technologies that streamline operations, increase efficiencies and sharpen data accuracy also complicate integration and interconnection.

Military operations in contested environments raise difficult problems in logistical support. Meanwhile, the proliferation of commercial off-the-shelf (COTS) and government off-the-shelf (GOTS) systems across agencies complicates joint operations.

Geographic, security and technological considerations drive a nebulous and shifting calculus in globalized logistical operations. Cost—not just in dollars, but also in downtime, response time and the movement or availability of skilled technicians and experts—adds a further layer of complexity to the equation.

CGI's Maintenance and Expertise Video Assisted (MaEVA) solution affords a technologically advanced, operationally proven and secure set of capabilities to overcome multiple problems and equip military services, law enforcement, security and intelligence agencies, and other organizations with decisive advantages.



Proven technology for the federal government

Through our collaboration with CGI, Inc.'s strategic business unit serving France, MaEVA is being made available to U.S. federal customers.

MaEVA is a highly adaptive and secure video-assisted collaborative technology solution that combines several tools into a single common operating picture with integrated real-time response– one that affords powerful capabilities for multiple military and civilian agency use cases.

At its core, MaEVA enhances collaboration through remote support and expertise sharing. The solution is much more powerful, feature-rich and secure than familiar commercial collaboration and conferencing platforms.

The system supports multiple video feeds to facilitate the sharing of diverse data and technical instructions in real time, with artificial intelligence and augmented reality features that allow maintainers, experts and field personnel to collaborate in real time.

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MaEVA empowers its users with automated workflows, recording and records management, and the ability to integrate a wide range of tools and sensors. Ready to be tailored to meet the needs of any specific agency or circumstance, it provides a common operating environment across geographies, with a staggering range of adaptive capabilities.

MaEVA leverages a modular open systems architecture that provides secure and rapid integration of a wide range of COTS and GOTS systems and devices, providing powerful joint operations capability. MaEVA can operate from any approved and integrated computer, tablet, smart phone or other device. Leveraging peer-to-peer architecture and AES256 encryption with secure file sharing, MaEVA is deployable on agency premises or in a secured government cloud environment.

Expanding reality

MaEVA is fully interactive with any user from any connected point and device. With accessories such as augmented reality glasses, it can bridge thousands of miles between personnel in the field and experts at a base or office. AR enables personnel in the field to be the virtual eyes of the experts at home, channeling visual input and critical data across the distance.

MaEVA's architecture supports the integration of multiple drones, robotics and sensor platforms into the same data feed. It bridges gaps in systems and tools, overcoming barriers such as software and hardware compatibility.

With this powerful data integration blending multiple streams of input, coupled with AI features, MaEVA is a technological force multiplier ideal for a variety of use cases.

Let's examine some of these:

Defense logistics: Remote maintenance and expertise solutions

Globally, CGI uses MaEVA in partnerships with multiple aircraft manufacturers and airline operators, and with the air force of a NATO nation. The solution has proven its ability to provide remote maintenance, troubleshooting and expertise support to field maintenance personnel and operators.

Operations in contested environments may limit the ability of specialized support engineers and technicians to deploy forward to where they are needed or prevent this movement altogether. Lack of funding and other logistical limitations can also prohibit or delay the ability of support teams to reach locations with equipment in need of repair.

MaEVA's real-time collaborative space and tools allow us to overcome these issues.

When an aircraft maintainer comes across a difficult issue, perhaps one that isn't covered in the maintenance manual or the maintainer's training, they can use MaEVA's collaborative tools and environment to contact higher level technicians or support engineers for real-time consultation.



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Using MaEVA-equipped devices, field maintainers and higher-echelon maintainers or engineers can share visual, textual and diagnostic data, and communicate collaboratively in real time. Completely cross-platform capable, MaEVA integrates with a wide array of advanced tools, such as scanning and measurement devices, digital borescopes and more. The personnel working directly on the aircraft can share everything they see and all data gathered from their tools and equipment with supporting engineers and experts.

The supporting experts can point in the maintainer's field of view to areas of interest where field personnel need to take a closer AR-powered look. They can then share technical information on screen and in field of view—including repair procedures and design schematics—and guide field personnel through the repair.

Moreover, because MaEVA enables engineers and technicians to provide their expertise without deploying to remote locations, it enables organizations to avoid travel costs and downtime.

Even when the experts can be on-site, MaEVA's powerful tools and collaborative space enhance work for complex operations because of its unparalleled ability to share and overlay technical data, facilitating diagnostics and repairs from all technicians' field of view.

MaEVA's collaborative tools and interface also improve and expedite diagnostics and troubleshooting with an optional technical maintenance/troubleshooting cockpit suite and other tools. When fully equipped, MaEVA allows for direct remote support and monitoring of maintenance and troubleshooting.

This proven ability makes MaEVA the ideal choice to support U.S. military and civilian federal agencies in their maintenance operations in a global environment, overcoming challenges due to logistical limitations and hostile powers.

Intelligence and law enforcement: Crime scene analysis

Law enforcement and intelligence/counter-intelligence operations and methods have evolved greatly over the last couple of decades, but many challenges remain. Crime scene analysis remains one of the most frustrating processes in any investigation, and it can make or break a case.



Crime scenes abound with challenges, including: Finding, identifying, preserving and cataloging evidence; controlling access and preventing contamination or transcribing and preserving accurate crime scene notes from investigators, responding officers, and witness testimony.

In complex cases involving multiple jurisdictions spanning several layers of government, which often involve several geographic locations, investigators and their supporting crime labs and other facilities are effectively separated and isolated. This only adds to an already-difficult task.

Prosecutions fail more often than we would like because investigators miss important evidence, or it gets lost or contaminated before trial, or jurisdictions don't communicate and share their findings well enough. Moreover, witness statements may change over time and quick-short-hand notes taken during a field interview may inadvertently omit critical details.

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MaEVA brings an intuitive, user-friendly, technology-based solution to this process. On the cutting edge of investigative collaboration tools, MaEVA allows the entire investigative enterprise to collaborate and mitigate some of the most common issues that frustrate these critical phases of an investigation.

Let's dive into a fictitious, but all too plausible, example:

Scenario: In the aftermath of terror attack, a joint task force raids two identified safehouses for the terror cell. There is reason to think a second attack may be imminent.

The attack occurred in New York, but the two safe houses are in two other states, New Jersey and Pennsylvania. Some of the suspected terrorists are apprehended, but several are unaccounted for.

In this scenario, you have three crime scenes—the attack site and both safe houses—multiple state jurisdictions as well as federal and potentially local departments, and an ongoing manhunt. If that weren't enough, there is a ticking clock to prevent a second bombing. Coordinating the investigative effort, to say nothing of the command and control required for the incident response, is a familiar but extensive challenge. Each of the multiple agencies involved will have its own set of equipment and configurations. Communications may take place over radios or mobile phones, in voice or text, or email. Each team of crime scene investigators is effectively operating in isolation until they have information to share, and sharing is rarely straightforward.

MaEVA-equipped agencies and investigative teams radically change this paradigm. Investigators and crime scene technicians have the following capabilities:



Real-time collaboration with full data and video sharing: MaEVA can securely connect every investigative team and agency working on the case, regardless of geography, as they search their crime scenes and interview witnesses.



Automated transcription and data logging: Through MaEVA, teams can automatically record and transcribe verbal and electronic crime scene notes, on-scene interviews and all crime scene recordings. The system provides video and image cataloging and sharing, and transcription of hand-written or printed notes.



Integrated AI and Augmented Reality features: MaEVA offers AI-automated workflows for records management, and optional AI visual modeling and analysis features. Users can connect integrated sensors and scanners to provide precise measurements and enhanced detection capability for anomalies or items of interest—even details too small for the naked eye to see. AR overlays can project sensor imagery and allow interactive collaboration within an investigator's field of view to anyone else with connected AR-glasses, a smart device, or a computer.

MaEVA ensures every crime scene team and receiving lab or evidence processing center can be connected in real-time with full data sharing and collaborative capability. Evidence technicians or other investigators can point out items of interest in the field of view of other investigators who are viewing the scene through AR glasses. An expert investigator in New York, for example, may recognize bomb-making materials when a tech at the Pennsylvania safe house looks at them. An investigator in New Jersey interviews a witness, and the automatically transcribed and logged file is immediately available to other investigators; a witness statement at one site may lead to a critical discovery on another site.

MaEVA's collaborative environment also helps reduce risk of crime scene contamination. With MaEVA, it is possible to dramatically reduce the number of personnel who need to go into a crime scene. With fewer people on the scene, but relaying data and video to others at remote locations, there are fewer opportunities for contamination.

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Healthcare: Advanced telemedicine and remote surgical support

MaEVA's collaborative space, tools and augmented reality capabilities make it an ideal choice for supporting a broad spectrum of medical applications. The same features that support remote maintenance apply similarly to medical operations.

Just as it does with technical engineers, MaEVA can extend the operational reach of surgeons and medical teams. Enabling collaboration and real-time cooperative consultation between multiple providers and specialists, while allowing real-time access, sharing and analysis of records and imaging, allows doctors to provide their experience and skill across the miles.

A forward medical facility in a disaster area, remote location or military operation may not have certain specialists or specialized surgeons on staff. With MaEVA teams in these operating environments can connect in real-time, share and overlay imagery and diagnostic data, and receive surgical guidance from the needed specialists.

This same capability lets field medics, first responders and advanced medical teams connect to doctors and other support immediately and on location – enhancing triage capabilities, improving and expediting exchange of patient/ treatment information, and accelerating access to critical life-saving care.



Defense, intelligence and first responders: Joint operations and crisis management

The crime scene investigation scenario above is just one example of the joint operations activities that local, state and federal agencies must undertake. Increasingly common in military, intelligence, law enforcement and emergency response, joint operations pose unique challenges that are different with each new combination of organizations—and their mismatched COTS and GOTS systems, surveillance platforms, communications infrastructure and other mission support tools.

All this disparity creates an operating environment in which overcoming some challenges often creates other challenges. Compatibility issues create artificial barriers and necessitate workarounds while forcing delays in operational coordination and execution.

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MaEVA is a proven solution that solves many tactical and technical integration problems. It also provides a single-screen solution allowing all agencies and operational elements to share a unified common operating picture with total data transparency.

MaEVA has already proven successful in chemical, biological, radiological and nuclear (CBRN) response exercises conducted by a NATO military unit coordinating with local law enforcement and emergency response units. MaEVA provided operationally secure real-time communications, coordination, support and decision-making capability. This exercise involved multiple staff, support and field teams, vehicles and drones, including sensors and sampling capabilities.

By engaging MaEVA's collaborative space and modular integration capabilities, all operators and points of control were able to communicate, coordinate and share data in a single 360° command and control space. The various teams shared recordings, remote video, still images, sample measurements and real-time geolocation data to coordinate their response. Field operators using connected augmented reality glasses and tablet computers received the same data views and information, enabling multiple experts across all levels of the responders to evaluate the same information.

This capability can be leveraged and translated into effectively any scenario involving a similar array of response layers, such as border security and crisis response. MaEVA's capabilities can be adapted and configured to connect agencies, departments and individual experts as needed to address any situation.

Conclusion

MaEVA is a proven, mature, off-the-shelf technology solution capable of addressing a broad range of use cases. It is a powerful video-assisted solution designed to support, accelerate and help secure federal operations from anywhere at any time. Equipped with a rich suite of collaborative digital and augmented reality tools, MaEVA enables agencies to enhance operational efficiency, responsiveness and precision across geographically distributed teams.

About the Author

Steven Toth is a Director of Consulting Services at CGI Federal, responsible for aviation, air defense and life cycle logistics management programs for the company's Army and Other Defense Agencies sector within the Defense, Intelligence and Space business unit. He has more than 24 years of military and civil aviation experience and additional background supporting international military, aeromedical evacuation, law enforcement and joint-security operations, and foreign military sales programs. He is a leading subject matter expert specializing in reliability, predictive analytics and systems analysis programs, maintenance program development, data driven decision making, and AI integration.

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