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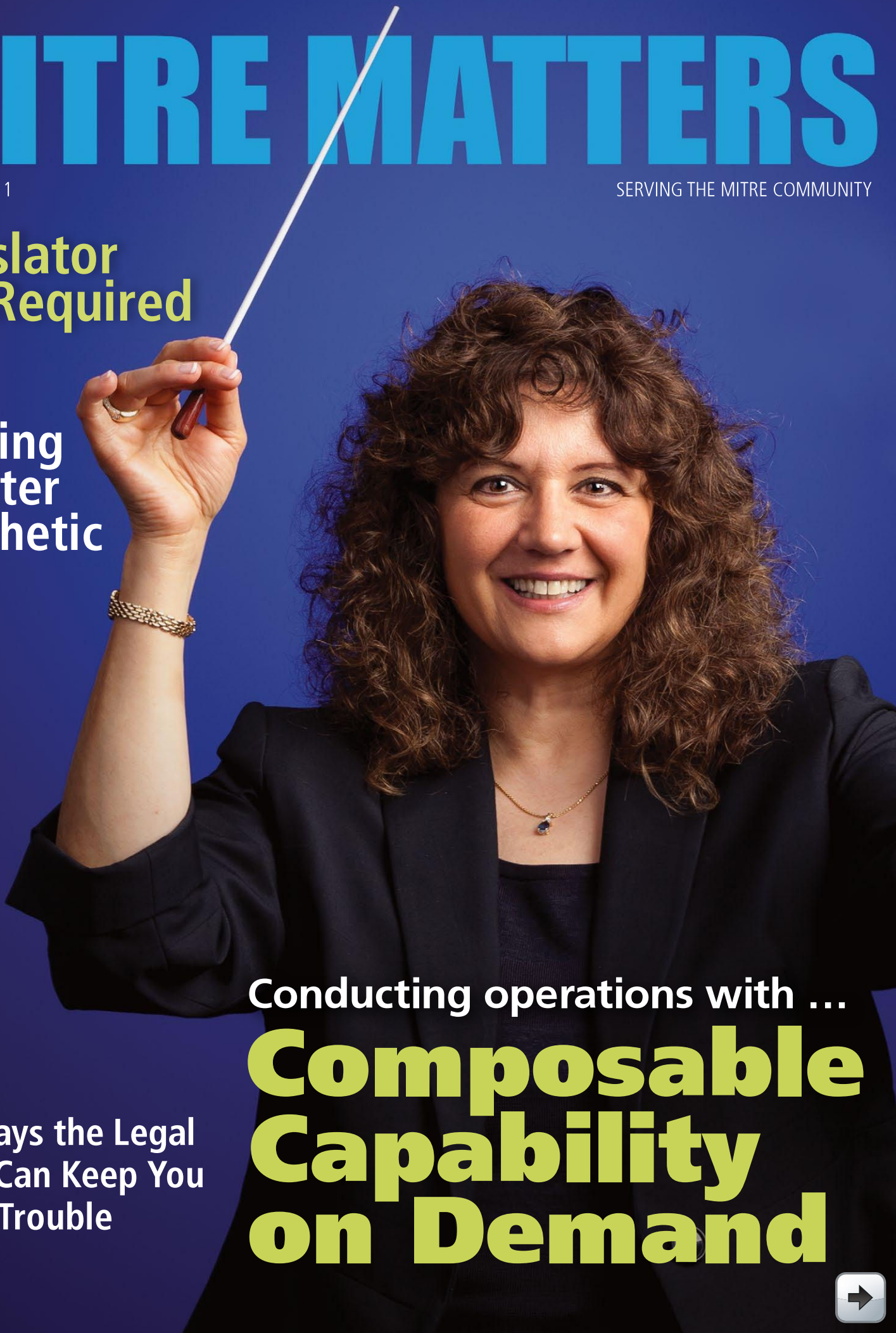

Conducting operations with …

Composable Capability on Demand

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QUITE CAPABLE, INDEED

A DIVERSE SET OF TECHNICAL RESOURCES, COLLECTIVELY KNOWN AS "COMPOSABLE CAPABILITY ON DEMAND," OFFERS A NEW MODEL FOR COMMAND AND CONTROL.

Tom Gannon explains a specific command and control capability during a demonstration in the ACME lab on the Bedford campus.

In the weeks following the earthquake that struck Haiti on January 12, 2010, dozens of relief organizations arrived in the capital city of Port-au-Prince. Amid rubble-strewn streets and crumbling infrastructure, the existing communications channels and equipment provided only spotty coverage at best. The devastating earthquake and its aftermath offer a dramatic example of the challenges facing military and civil organizations in coordinating response and relief efforts.

To help support timely situation assessment in a highly fluid situation, a MITRE research program is working on ways to bring adaptive, responsive command and control systems to the field. The wide-ranging research program is called Composable Capability on Demand, or CCOD®.

As a concept, CCOD promotes a new approach to the design and development of an information technology-based command and control capability, and how users employ it.

The key objective of CCOD is to empower users—the warfighter, first responder, or others—to adapt to dynamically-changing mission by exploiting information as required to enhance situational awareness, collaboration, and decision support. "CCOD allows its users to connect different technologies as necessary for the task at hand," says Julie DelVecchio Savage, chief engineer in MITRE's Command and Control Center.

In a larger sense, CCOD also offers a new and more agile acquisition paradigm. By fielding infrastructure, components, and a method to employ them, CCOD enables a more rapid evolution of capability than what is feasible with today's acquisition processes.

Fielding new technology

CCOD follows principles similar to commercial information technology development. This means combining data and services to create "new" command and control capabilities, often in the form of Web or mobile services or applications that are integrated as needed. To provide this versatile capability to users, CCOD relies on mashup editors, application stores, virtualization, cloud computing, mobile computing, and other existing technologies. It also introduces and tests new technology solutions.

Ultimately, CCOD is designed to provide an adaptive and robust environment that allows its users to configure, create, and display information in virtually any domain as well as provide the necessary computing and network resources. This requires the seamless employment of a variety of enabling technologies.

Rethinking command and control

"Command and control" is traditionally associated with combat operations, but the same capabilities are needed in a wide range of new roles, including peacekeeping operations, training security forces, and providing essential local services during disaster relief. Whether establishing a command center on the battlefield or during a natural disaster, CCOD offers a new model based on applicable and ready IT-based solutions.

"Our strategic environment has fundamentally changed," says DelVecchio Savage. She cautions that we must consider the nature of current and evolving threats to U.S. security and our strategic interests, explore lessons learned from recent and ongoing conflicts and natural disasters, and respond by developing command and control capabilities that will be effective across the widest possible spectrum of conflicts and crisis situations that we are likely to face in the future. "It is no longer sufficient to rely on military doctrine and command and control systems designed for conventional full-scale warfare and phased operations," she adds.

Build and test

Last September, a dozen or so onlookers watched a demonstration in the ACME lab in Bedford, where researchers integrated command and control capabilities as part of a series of three vignettes based on a devastating earthquake disaster scenario. It was the third in a series of year-long "build and test" events that moved along a continuum from technical problem resolution to solving operational issues.

"These events reflect a progression from individual project innovations toward achieving integrated build and test of CCOD

principles—establishing a MITRE-developed CCOD platform—and demonstrating how CCOD enables effective command and control in situations that require a response to dynamically changing mission needs and cross-boundary information sharing and action," says DelVecchio Savage.

As the first demonstration to showcase every project in the CCOD portfolio, the September event proved to be a turning point for CCOD and the MITRE Innovation Program. "We wanted to show the value of the capabilities that the CCOD research projects could bring to such a situation," explains DelVecchio Savage. "MITRE is investing significantly in the possibilities that CCOD offers to a wide range of our customers."

This integrated build and test approach is underway again this year, and will culminate in August with an experiment involving the U.S. Marine Corps.

Engaging users

Recently a CCOD team visited U.S. Army Europe (USAREUR) and provided an integrated demonstration of six projects during one of their command post-exercises. The well-received demonstration resulted in an invitation to participate in a bigger exercise in Germany called Austere Challenge '11. MITRE plans to transition the capability as part of USAREUR's permanent tool suite available for their contingency command post. The team is also scheduled to demonstrate CCOD to European Command (EUCOM) and Africa Command (AFRICOM) headquarters, United States Air Forces in Europe (USAFE), and U.S. Army AFRICOM (USARAF).

CCOD also plays a key role for homeland security. A 2010 mobilization exercise conducted by the Federal Emergency Management Agency and the Los Angeles Fire Department included CCOD tools and techniques to reconstitute a tactical communications network and rapidly integrate data. An upcoming collaborative effort between U. S. Northern Command, the U.S. Coast Guard, and other organizations focused on harbor security will also include CCOD participation.

"There's still work to be done to develop and test the CCOD technologies, engage industry, and develop the supporting business strategy, and we are working on all of these fronts," says DelVecchio Savage. "But recent demonstrations with a wide range of users confirm that what we are doing is helping to shape the future of command and control."

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Learn more about CCOD at MITRE.