



The Computerworld Honors Program

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Final Copy of Case Study

Year:

2013

Status:

Laureate

Organization Name:

Defense Information System Agency (DISA), Modeling and Simulation Division, Enterprise Analysis Branch (EE44)

Organization URL:

<http://www.disa.mil/Services/Enterprise-Engineering/JCSS>

Project Name:

Joint Communication Simulation System (JCSS)

Please select the category in which you are submitting your entry.

Collaboration

Please provide an overview of the nominated project. Describe the problem it was intended to solve, the technology or approach used, how it was innovative and any technical or other challenges that had to be overcome for successful implementation and adoption. (In 300 words or less.)

IT superiority gives our warfighters unprecedented advantage over our adversaries, allowing them to take the battle directly to the enemy while minimizing casualties. There have been significant advances in how warfighters communicate through the development of advanced tactical communication systems, state-of-the-art supply chain logistics enabled by the deployment of CAISI (Combat Service Support Automated Information Systems Interface), and real-time battlefield situation awareness achieved by live video beamed back from predator drones. Behind all these technological advancements, the DoD has relied on advanced modeling and simulation (M&S) capabilities to develop and

analyze systems prior to deployment. M&S is a cost-effective way to analyze large systems without having to build a prototype or deploy large numbers of network devices to test a system's performance. M&S tools can accurately represent communications networks as simulation models and reduce the time required to analyze complex systems. There has been very little M&S collaboration among various DoD agencies, resulting in duplication of effort and no channel to share simulation models. This has resulted in the development of disparate network systems that were not interoperable and didn't meet performance requirements. There was a need for a joint simulation capability that could not only represent the core, strategic, and tactical networks but also provide a platform through which capabilities like simulation models could be shared to conduct detailed engineering analyses of various DoD systems. The DISA Enterprise Engineering (EE) Division developed and fielded the Joint Communication Simulation System (JCSS) to solve these challenges. JCSS serves as the model library for the DoD, providing a database of Joint communication equipment models that ensures studies are consistent throughout the Unified Combatant Commands, Services, and others within the Command, Control, Communications, and Computer Systems (C4) community.

When was this project implemented or last updated? (Please specify month and year.) Has it incorporated new technologies and/or other innovations since its initial deployment? (In 300 words or less.)

JCSS was first released in 2001; a new version of the software has been released every year.

Is implementation of the project complete? If no, please describe the project's phases and which phase the project is now in. (In 300 words or less.)

Project implementation is complete.

Please provide at least one example of how the technology project has benefited a specific individual or organization. Feel free to include personal quotes from individuals who have directly benefited from the work. (In 300 words or less.)

Collaboration of Modeling and Simulation capabilities among various DoD agencies, enabled through JCSS, has resulted in quicker prototyping, analysis and deployment of network services critical to warfighter success. JCSS has helped the U.S. ARMY improve supply chain logistic through deployment of CAISI that allows combat service support (CSS) automation systems to electronically exchange information with logistical support areas with no prior communication infrastructure. Previously, soldiers had to manually extract and

carry logistic data on a disk that would then be analyzed and processed; this was especially challenging in areas like Afghanistan where the terrain is hazardous. The CBM (Condition Based Maintenance) system that encompassed CAISI allows for rapid capture and flow of logistic information, enabling quicker and accurate replacement of various system components. This prevents deployment of malfunctioning equipment in the field. Engineers use JCSS to quickly study various deployment strategies for CAISI in the battlefield, assuring warfighters that their equipment will function as intended. Similarly, unmanned aircrafts have improved the situation awareness capability of the military. DISA plays a vital role in disseminating tactical unmanned aerial vehicle (UAV) video to command centers and other deployed warfighters. To accomplish this, it relies on its SATCOM capabilities and the DISN (Defense Information System Network), which provides long-haul information transfer services for all DoD activities. DISA used JCSS to design and study the impact of various multicast implementation strategy that would allow for UAV video dissemination among various services and agencies. Having instantaneous battlefield situational awareness has led to improve collaboration and better decision-making. Superior IT is key to helping warfighters win battles decisively while avoiding casualties. With the looming DoD budget cuts, increased JCSS-enabled collaboration and information sharing will ensure our warfighters continue to have access to mission-critical services.

Would this project be considered an innovation, a best practice or other notable advancement that could be adopted by or tailored for other organizations and uses? If yes, please describe that here. (In 300 words or less.)

Best Practice: The JCSS software can be tailored to study any types of network system needed to provide force protection against a wide variety of threats in any theater of operation.

If there are any other details that the judges should know about this project, please note them here. (In 300 words or less.)

The JCSS software provides enhanced modeling and simulation capability that enables rapid prototyping, development and fielding of network systems. These capabilities have shaped modern warfare resulting in a superior combat force, thereby saving U.S. forces from injury and death. JCSS has enabled unprecedented collaboration among disparate M&S working groups within the DoD by providing a common simulation environment where models can be shared and applied as needed. This enabled various DoD systems to be analyzed from the information producer to the consumer, ensuring interoperability and the system performance meets the requirements. Numerous communication systems, including many that are being fielded today like IP-based interoperable radios, logistic support and SATCOM Systems, have been analyzed using JCSS,



which has resulted in improved efficiencies and effectiveness in the acquisition process. The DoD community relies on JCSS to conduct network engineering studies by leveraging the shared simulation models developed by others within the community. This collaboration directly benefits the DoD, as it reduces the cost to analyze and field advanced systems while ensuring continuous delivery of innovative technology to the warfighters.