
The newsletter for the Defense modeling and simulation community

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1. DIRECTOR'S CORNER -- MEET THE NEW DMSO DIRECTOR

By Col Kenneth C. Konwin
Director, DMSO

It is with great pleasure and satisfaction that I take this opportunity to welcome you to my first column as Director of the Defense Modeling and Simulation Office (DMSO). It has been a rare privilege to work

these past nine months as Deputy Director to Navy CAPT Jim Hollenbach, the now retired past Director. I join Jim's peers and the professional organizations that have recognized him with thoughtful awards for the accomplishments he led within the Department during his time at the helm of the DMSO. There were some of us that seriously questioned whether Jim, having put so much of his personal and professional energies into the mission, would be able to break away, hand over the reins to someone new, and start his next career.

However, even the seed of the solution to this challenge was evident several months ago. It is not by happenstance that Dr. Anita Jones, then Director of Defense Research and Engineering, and Jim approached me over a year ago to interview for the opportunity that I have now been entrusted with as the Director. But if you have worked closely with either of these two professionals, it shouldn't surprise you to know that they were thinking, even then, of the sustaining technologies, actions, processes, and people that would carry the Department forward in the critical application area of modeling and simulation (M&S). They knew that the basis of a strong technical foundation was already being put in place in the definition and fielding of the Common Technical Framework and associated High Level Architecture (HLA). They wanted to demonstrably show that the DMSO could understand the needs and appreciate the peculiarities within each of the Training, Analysis, and Acquisition functional domains. I hope that their trust and my recent experiences in the analysis and acquisition areas will complement an already strong team within the DMSO organization.

Many of you are wondering what a change at the helm of the DMSO means to the policies, work underway, or projects planned for the near term. Rest assured, the benefit of having flown wingman to CAPT Hollenbach's lead for this fiscal year means that you can expect stability in the goals and objectives of the organization. During the past year, the DMSO has initiated or refined processes that will help formulate responses to the existing and emerging needs of our modeling and simulation community customers. While the DMSO has been and will continue to produce world-class solutions in collaboration with our teammates in the Services and Industry to M&S needs, we will continually strive to actively listen to the voice of our customers - the Senior Department of Defense Decision-makers and Warfighters. Finally, I'd like to share with you three words that remind me of the essence of what I think is important - People, Partnerships and Pragmatism.

People: During my career, I have been blessed to work with and for some of the greatest individuals in a variety of professional settings. Once you have worked with such All-Stars, you unfortunately develop an intolerance for anything less. In recent months, the DMSO has been representing the United States in the formulation of the first NATO M&S Master Plan. During these meetings, conferences like the International Training and Education Conference (ITEC), and bilateral interactions with nations, I have met innovative and mission-driven colleagues undertaking challenging projects (many using the HLA) that present the "can do" attitude that separates potential from action. I am convinced that we in the United States must all strive to identify, develop and sustain a world-class M&S workforce - one focused on identifying and solving the very tough challenges that lie between the promise and exploitation of M&S.

Partnerships: If they ever existed, the days of solving tough problems in isolation are gone. As the Department of Defense has embraced the Integrated Product and Process Development, we must find the critical opportunities to partner with our sister Services, Industry, and allies to leverage the critical insights and talents that each community has to offer towards solving our common, toughest problems. The recent Conference on Computer Generated Forces and Behavioral Representation (7th CGF) was cosponsored by the DMSO, the Office of Naval Research, and the Army's Simulation, Training and Instrumentation Command. In both the DoD M&S Master Plan and the recent related report from the National Research Council, the modeling of human behavior was highlighted as one of the most important but toughest intellectual problems facing the expanded use of M&S.

In another arena, the M&S Acquisition Council-led Joint Task Force on Simulation Based Acquisition relies on fostering the constructive dialogue that must occur between the Department, the Services, and the "heavy" Industry. They are chartered with delivering a roadmap for planned activities that can encourage and shape the modernization process into one that defines, delivers and supports products for the warfighter faster, better and more affordably. It is only through partnerships like these that we can achieve the needed degree of interoperability that we seek across the various communities.

Pragmatism: My last assignment in the Joint Strike Fighter program office taught me a number of lessons. One is the necessity of having short, intermediate and long-range views towards solutions to problems, and crafting a program that addresses the needs of all within available resources. It is the recognition that successful strategies are formulated, or at least refined, with stakeholder involvement and must honor and

provision for the differing perspectives stakeholders have toward the accomplishment of strategic goals. I am encouraged by the quality and substance of the debate that occurs in forums such as the HLA Transition Issues Team. In this small group of DMSO and Service representatives, the knotty issues of "all simulation" definition, HLA transition intention classification, HLA waiver criteria, and associated processes were discussed, synthesized and recommendations forwarded and approved this past April by Dr. Jacques Gansler, Under Secretary of Defense for Acquisition and Technology. We are pursuing additional forums to encourage productive dialog in areas such as interoperability of manned aircraft simulators, M&S support to the Joint Staff and Atlantic Command (ACOM) for the Joint Warfighting Program, and HLA-related commercial tools marketplace requirements.

As you can see, there are a multitude of areas in which we can all continue to make significant contributions. I encourage your active participation in the definition, development, exploitation and use of the M&S within your functional areas. Seek out the opportunities to share with and learn from your colleagues in forums such as those sponsored or supported by the Defense Modeling and Simulation Office. If we can harness the professional energies of all the constituents - Together we can "Make it Happen!!"

2. INDUSTRY DAYS --

ANNUAL DOD M&S UPDATE FOR GOV'T INDUSTRY SET FOR JUNE 2-3

By Sherrel Mock and Bruce Bailey
DMSO Staff

The Defense Modeling and Simulation Office (DMSO) will host the "Seventh Annual State of Modeling and Simulation Briefing to Government and Industry," or Industry Days, on June 2-3 at the Ritz-Carlton Hotel in McLean, VA.

Dr. Jacques S. Gansler, Under Secretary of Defense for Acquisition and Technology (USD(A&T)), will provide the keynote address on Tuesday morning, June 2. He will be followed by Air Force Col. Kenneth C. Konwin, new DMSO Director, who will present the "Department of Defense (DoD) Modeling and Simulation (M&S) Update."

The rest of the day's program will be devoted to panel discussions on "Joint and Service Perspectives on M&S," "Commander-in-Chief (CINC) M&S Issues," and "M&S Program Reports." A no-host reception to honor former DMSO Director, Navy CAPT (Retired) James W. Hollenbach will begin at 6 p.m.

***SBA discussions on Day 2

The next day, June 3, emphasis will be on Simulation Based Acquisition (SBA). Dr. Patricia Sanders, Director, Test, Systems Engineering and Evaluation (DTSE&E) and Army BG Joseph L. Yakovac, Deputy for Systems Acquisition, U.S. Army Tank-Automotive and Armaments Command (TACOM), will lead a panel discussion on SBA from the DoD's perspective.

SBA from Industry's perspective will be provided in a panel discussion led by Ms. Linda K. Poole, Program Manager for the Virtual Product Development Initiative at Lockheed Martin, and Mr. Mark Gerish, President and Chief Executive Officer of M&S Automotive Specialists, Inc. A discussion of "M&S in Major Weapons System Acquisition" will follow the SBA panel sessions. The Modeling and Simulation Industry Steering Group (M&S ISG) will conclude the day's events with its annual update.

Industry Days provides an opportunity for the DoD to update industry and interested government organizations on the various programs and initiatives in M&S within the DoD. The briefing will include the status, goals and plans under the purview of the DMSO, as well as information from the DoD, Military Services, Joint Staff, Unified Combatant Commands, other government agencies, and representatives of the M&S industry. Special emphasis will be on the current and future developments and trends for M&S programs. The briefing is for industry and government/military executives, strategic planners, and senior technical management.

***Demonstrations

The DMSO will also sponsor the following demonstrations of the DoD Common Technical Framework (CTF) and supporting services:

- DoD M&S High Level Architecture (HLA). Demonstrations include Federate Compliance Testing, ModSAF and JAGER.
- Conceptual Models of the Mission Space (CMMS). See the CMMS articles, #12 and #13, below.
- Authoritative Data Sources (ADS). See the ADS article, #14, below.
- Data Verification Interactive Editor (DAVIE). See the DAVIE article, #15, below.
- Modeling and Simulation Resource Repository (MSRR). See the MSRR article, #6, below.
- Master Environmental Library (MEL).
- Synthetic Environments Data Representation and Interchange Specification (SEDRIS).
- Modeling and Simulation Operational Support Activity (MSOSA). The MSOSA will debut the new

Model and Simulation (M&S) Calendar. The new SBA Interest Area will also be featured, along with normal help desk services. See the MSOSA article, #3, below.
-- Order of Battle Data Interchange Format (OB-DIF). See the OB-DIF article, #17, below.
-- Object Model Library (OML).
-- Object Model Data Dictionary (OMDD).

Demonstrations will be located in the foyer adjacent to the General Sessions. They will be open 5-7 p.m. on Monday evening, June 1; 12:30-7:30 p.m. on Tuesday, June 2; and 7 a.m. to 5 p.m. on Wednesday, June 3.

A detailed agenda, registration information and form, and directions to the hotel are available online at <http://msis.dmsomil/docslib/briefs/indday/indday98/>. All briefings presented during Industry Days will be available at the web site beginning on June 1.

Support for Industry Days is provided by the National Training Systems Association (NTSA), an affiliate of the National Defense Industrial Association (NDIA) and the M&S ISG.

3. MSOSA DEBUTS NEW M&S CALENDAR

By Marc R. Erlandson
MSOSA Director of Operations

On June 1, the Modeling and Simulation Operational Support Activity (MSOSA) will introduce its latest new service, an online, interactive M&S calendar. This calendar is intended to be the definitive source of information on upcoming M&S related events, including conferences, exercises, work shops and meetings.

Visitors to the M&S Calendar web site can find information about events through the use of a variety of calendar views and the site's integral keyword search feature. In addition to the typical event data such as date, location, event description and point of contact information, whenever possible, calendar entries will have links to their hosting organization's web site and online registration forms. On the day of its debut, the calendar will already be populated with information on over a hundred M&S related events. All government and commercial activities are encouraged to submit information on their M&S related events by using the input form that is an integral part of the site. Be sure to check out the calendar to see what is happening in the M&S community beginning 1 June, on MSOSA's web site at <http://www.msosa.dmsomil/mscalendar/>.

The MSOSA continues to serve as the central modeling and simulation (M&S) help desk, while expanding

its efforts to provide information and services to the M&S community.

Other new MSOSA services to look for in the coming weeks are a "frequently-asked-questions" feature and expanded web-site information services. For the latest information on the popular topics of Simulation Based Acquisition (SBA) and M&S support to Operations Other Than War (OOTW), see the "Special Interest Area" feature on the MSOSA web site.

Later this summer, M&S will open a web site on the Secret Internet Protocol Router Network (SIPRNet). This site complements the MSOSA's already active Intelink site (TS/SCI high system) at http://www.dia.ic.gov/proj/model/ms_help/default.htm and its unclassified site at <http://www.msosa.dmsomil>.

The MSOSA help desk is still the first place to check for M&S advice, information and answers to specific questions. In addition to general M&S questions, the MSOSA help desk also serves as the central help desk for High Level Architecture (HLA) and Modeling and Simulation Resource Repository (MSRR) related requests for assistance.

Call the MSOSA Help Desk at (703) 998-1623, or toll free in the Continental U.S. at (800) 510-6399. International toll-free numbers are also available from several foreign countries. These numbers are listed on the MSOSA web site. Send e-mail requests for assistance to msosahelps@msosa.dmsomil.

4. NATO MSMP CLEARS ANOTHER HURDLE AT MAY MEETING,
SCHEDULED FOR FALL COMPLETION

By Kelley Neal
DMSO Staff

The North Atlantic Treaty Organization (NATO) Modeling and Simulation Master Plan (NMSMP), scheduled for Fall 1998, continues to move toward completion.

During the week of May 4-8, nation representatives of the Steering Group on Modeling and Simulation (SGMS) reviewed and agreed to Version 0.3 of the master plan. Unless one of the nations disagrees with the latest revision of the plan, it will be approved as Version 1.0 during the July SGMS meeting. From there the plan will be briefed to the NATO Research and Technology Board on Sept. 21, and to the Conference of National Armaments Directors (CNAD) and Military Committee on Nov. 5.

During the July meeting the SGMS will also review and approve the final report of SGMS activities that

resulted in the NMSMP. After the final report is approved, it along with the NMSMP, will be forwarded from the CNAD to the North Atlantic Council for approval.

The MSMP, which has taken over a year to write and develop, will provide guidance on future M&S interoperability and reuse in the Alliance.

U.S. Air Force Col. Ken Konwin, new director of the Defense Modeling and Simulation Office (DMSO), has replaced former DMSO director, U.S. Navy CAPT (Retired) James W. Hollenbach, as chairman of the SGMS.

5. CGF, BEHAVIORAL REPRESENTATION DISCUSSION DRAWS 300

By Dr. Ruth P. Willis
DMSO Staff

About 300 people attended the three-day Seventh Computer Generated Forces (CGF) and Behavioral Representation Conference, May 12-14, in Orlando, FL. Participants came from the U.S., Europe, Asia and Australia.

Sponsored by the Defense Modeling and Simulation Office (DMSO), the Office of Naval Research and the U.S. Army Simulation, Training and Instrumentation Command, the conference included general interest sessions as well as technical presentations.

During the opening Plenary Session, attendees were afforded the opportunity to hear detailed presentations on the status of the Joint Simulation System (JSIMS), the Army's OneSAF program and the Air Force's Distributed Mission Training program. The Tuesday evening Plenary Session featured an address on "CGF Development - Lessons Learned" and an overview of the DMSO-sponsored study on "Modeling Human and Organizational Behavior: Application to Military Simulations." The Wednesday evening Plenary Session was dedicated to Synthetic Theater of War '97-related developments and activities. On Thursday the conference concluded with an invited presentation on "The Future Architectural Landscape of CGF," and a panel discussion on individual Service/Agency needs for future CGF research and development.

Conference proceedings are available from the University of Central Florida's Institute for Simulation and Training, which developed and hosted the event. Visit the IST web site at <http://www.ist.ucf.edu/> or call (407) 658-5000.

Dr. Ruth P. Willis is the DMSO point of contact for Behavioral Representation at 703-824-3438 or

rpwillis@msis.dmsomil.

6. LOOKING FOR THE MSRR, CHECK THE MSOSA

By Gary L. Misch
MSRR Project Lead

The Modeling and Simulation Resource Repository (MSRR) is now a service of the Modeling and Simulation Operational Support Activity (MSOSA). The system is on the Internet at <http://www.msrr.dmsomil> and on the Secret Internet Protocol Router Network (SIPRNet) at <http://140.199.160.81>.

Additionally, there are several MSRR-related sites, either on line, or soon to be on line, operated by the Office of the Secretary of Defense (OSD), Army (<http://www.msrr.army.mil/>), Navy, Air Force (<http://afmsrr.afams.af.mil/>), Ballistic Missile Defense Organization (BMDO), and the National Ground Intelligence Center.

The unclassified system now offers both an electronic card catalog (registry) and the Ultraseek and Verity search engines. Those organizations that wish to share any resources with the DoD M&S community by putting them (or just their description) on line, contact the MSRR Registrar at (703) 998-1677, or the MSOSA Help Desk, at (800) 510-6399.

The MSRR program provides a method of sharing any reusable resource while protecting that resource from unauthorized access. The MSRR Authentication and Authorization (A&A) software permits resource owners to maintain access restrictions on an individual or group basis. A&A software is currently available for Microsoft Windows TM NT Server TM, supporting both the Netscape Enterprise Server TM and the Microsoft Internet Information Server TM. A&A offers a simple and highly reliable method of enforcing need to know, while imposing a minimal burden on both the access administrator and the user.

For information on the MSRR program contact Gary Misch, (703) 575-1094, gl@msrr.dmsomil.

The DMSO Program Manager is Army LTC Harry Thompson, (703) 998-0660, thompson@msis.dmsomil.

7. HLA TOOL DEVELOPMENT WORKSHOP --
DMSO TO MEET WITH TOOL DEVELOPERS JUNE 30

By Penelope F. Grammer
DMSO Staff

The Defense Modeling and Simulation Office (DMSO) will host a High Level Architecture (HLA) Tool Developers Workshop on June 30, 1-4 p.m., at the Institute for Defense Analyses (IDA) Conference Center, Suite 121, 2001 North Beauregard St., Alexandria, Virginia.

The purpose of the workshop is information interchange with commercial organizations who have an interest in developing and marketing automated tools to support the use of the HLA. The DMSO will provide an overview of the HLA Tool Architecture, the fundamental strategy for Data Interchange Format (DIF) management, and an overview of current DMSO-sponsored tool development projects. The meeting will focus on establishing through open discussion what actions DMSO can take to better establish a marketplace for commercial tool vendors.

The intended audience for the workshop is commercial tool development activities, however, government personnel requesting attendance will be accommodated on a space-available basis.

Because the size of the conference room limits the number of attendees for this information exchange, the DMSO will accept registrations on a first come, first served basis until the capacity of the room is reached. Only one attendee from each organization will be accommodated initially, however, as opportunity permits, requests from additional representatives from attending companies, or government agencies will be honored.

Registration is available online at the HLA web site at <http://hla.dmsso.mil>. Click on the "What's New" icon and select the "HLA Tools Workshop" item. Registrants will be given the option of indicating whether they are the primary representative, or requesting to attend in addition to the primary. Those who cannot attend the workshop, but would like to receive information provided to attendees, may also indicate their desire on the registration form.

For additional information contact Penelope F. Grammer, 703-824-3412, pgrammer@msis.dmsso.mil.

8. HLA TRAINING EVENTS SCHEDULE

Upcoming HLA Regional Training Events

Midwest	June 25-26	Wright-Patterson AFB, OH
Central	July 29-30	Ft. Leavenworth, KS
Northwest	Aug. 18-19	Seattle, WA
Southeast	Sept. 9-11	Atlanta, GA
Southwest	Oct. 20-21	San Diego, CA

Mountain Nov. 18-19 Colorado Springs, CO

Upcoming HLA Hands-On Training Events
(All sessions are conducted in Alexandria, VA)

June 8-11

June 22-25

For details on registrations, deadlines and the most current information visit the HLA web site at <http://hla.dmsomil/> and select the "HLA Education and Training" topic.

9. MSSOC SLATED FOR FIRST SESSION IN EUROPE

By Carrie D. Shaw
MSSOC Registrar

The Department of Defense (DoD) Modeling and Simulation Staff Officer Course (MSSOC) will be held at the Warrior Preparation Center (WPC), Einsiedlerhof Air Station, Germany, Aug. 3-7.

This marks the first European offering of the course. Over 200 students have completed this modeling and simulation (M&S) familiarization course for newly assigned M&S staff officers, DoD civilians and contractors supporting DoD M&S activities.

Acceptance for the MSSOC is by application only. All participants must submit an application for consideration by the Defense Modeling and Simulation Office (DMSO). Priority is given to newly assigned M&S staff officers serving in the European theater with little or no M&S experience. Space is limited to 40 students. Applications are accepted on a first come, first served basis for the first 20 applicants and on a case-by-case basis for the second 20. Applicants should apply early to ensure a seat in the class.

The MSSOC was developed to provide an overview of M&S fundamentals, organizations, policies, requirements, programs, and resources. It was designed to provide staff officers with a basic foundation of M&S knowledge across the three M&S domains: training, analysis and acquisition. Students acquire a broad understanding of DoD M&S terms, concepts, organizations and issues.

In addition to the core curriculum, students will tour the WPC. Guest speakers and participation in a panel discussion with guests holding key positions in the M&S community round out this unique M&S education experience.

The MSSOC is only one segment of the DMSO's Education Program. Future developments include an Executive Level Course for general officers, admirals, and SES's; a course for program managers and their

staffs; online availability of lesson material; and an M&S Education Library for user reference.

Online applications and further course information are available via the MSSOC web site at <http://www.dmsso.mil/SOC/>, or contact the MSSOC European point of contact, Mr. Frank Swords, Warrior Preparation Center, DSN 489-7500, or Commercial 49-631-536-7500.

The DMSO Program Manager is U.S. Army LTC Harry Thompson, (703) 998-0660, thompson@msis.dmsso.mil.

10. M&S STAFF OFFICER COURSE --
COURSES, DATES AND LOCATIONS

- MSSOC 98-6: June 15-19, Univ. of Central Florida, Orlando (for M&S educators only; educators from civilian and military institutions are encouraged to apply.)
- MSSOC 98-7: July 13-17, Arlington, VA
- MSSOC 98-8: Aug. 3-7, Warrior Preparation Center, Einsiedlerhof, Germany
- MSSOC 98-9: Sept. 21-25, Albuquerque, NM
- MSSOC 99-1: Oct. 26-30, Arlington, VA

For additional information, or to apply online visit the MSSOC web page at <http://msis.dmsso.mil/SOC/>.

11. DMSO WORKING REPRESENTATIONAL RESOURCE ISSUES,
IPT MANAGING THREE EXPERIMENTS

By Paul G. Foley
DMSO Staff

The Defense Modeling and Simulation Office (DMSO) has recently established an internal Integrated Product Team (IPT) to address issues associated with developing a data program, providing a consistent functional description of the mission space and establishing a framework to address the areas of environmental, systems, and human behavioral representations in modeling and simulation (M&S) systems.

Several Representational Resources Integration Experiments (RRIE) have been planned to define the critical integration issues relating to the interfaces among equipment characteristics and performance data, environmental data and computer generated forces.

These experiments leverage prior DMSO investments in technology required to develop a correlated view of the surf zone. An IPT process is being used to manage the experiments with team members selected from Department of Defense (DoD) laboratories, DoD system acquisition programs, and major DoD M&S

program development offices. Members serve on one of two IPT work groups.

The Simulation Specification Work Group focuses on defining procedures and resources needed during the initial planning phase of a simulation. This group will give particular attention to developing procedures for identifying and prioritizing the environmental effects associated with a specified simulation scenario.

The Data Generation and Fusion Work Group concentrates on defining procedures and resources needed during the later planning phase or actual execution of a simulation. Examples of this group's tasks are developing procedures for ensuring data consistency among the environmental domains; determining methods for multi-resolution representation; developing methods that ensure the proper coupling among the environment, systems and human behavior representations; and identification of specific production facilities.

The three experiments include:

- (1) expanding the environmental interaction within the Global War Game,
- (2) examining how the environment affects the performance of the Army's Grizzly mine plow during beach and near-shore operations, and
- (3) analyzing how the Marine Corps' Advanced Amphibious Assault Vehicle (AAAV) performs under different sea state and visibility conditions during movements-ashore operations.

The Grizzly and AAAV will be simulated using the Joint Countermine Operational Simulation software. Details of the experimentation design and results will be published when the experiments are completed in early 1999. The experiments begin with the Global War Game this summer and will end with the AAAV simulation in November 1998.

All three DoD M&S Executive Agents (MSEAs) for the Natural Environment and DMSO staff representatives responsible for system and human behavior representation are supporting the project. The MSEA for the Air and Space Natural Environment serves as the lead for project management.

12. CMMS SEEKS TO PROVIDE DIRECT LINK BETWEEN SUBJECT MATTER EXPERTS,
SIM EXPERTS FOR CREDIBLE, TRUSTED SIMS

The Defense Modeling and Simulation Office (DMSO) is leading a Department of Defense (DoD)-wide effort to provide an integrated framework and toolset for developing Conceptual Models of the Mission

Space (CMMS) as directed by the DoD Modeling and Simulation Master Plan (MSMP). CMMS provides simulation-independent warfighter descriptions of real world processes, entities, environments, implementation and relationships.

The CMMS, High Level Architecture (HLA) and Data Standards programs constitute the three major components of the DoD modeling and simulation (M&S) Common Technical Framework (CTF).

The CMMS program objective is to provide a direct link between subject matter experts (military operations, combat behavior, units, systems, environment) and simulation experts (developers and users) for credible, trusted simulations.

This link has three components:

- Actual subject matter descriptions in the form of knowledge acquisition products. Producing and maintaining these is a shared responsibility between subject matter and simulation experts. Knowledge acquisition is the responsibility of the individual M&S programs.

- A common repository for use and reuse of the subject matter descriptions. Implementing and operating this repository is a shared responsibility among DMSO, Authoritative Data Sources, and M&S programs.

- A technical framework for integration and interoperability of the knowledge acquisition products registered in the common repository.

The CMMS provides the simulation developer with support for conceptual model creation, integration, and maintenance within DoD simulation programs and interoperability across DoD simulation programs through Common Semantics and Syntax (CSS), Data Interchange Formats (DIFs), CMMS model libraries, and supporting tools and utilities.

The users of the CMMS are many and diverse and include:

- Program Sponsors use the CMMS to help describe the scope of their programs.

- Exercise developers use the CMMS to help describe the functional requirements for their training, analysis or acquisition usage as a framework for creating simulation scenarios, and as a guide for evaluating exercise results.

- Warfighters use the CMMS as a tool to create and maintain descriptions of the military operations mission space.

- Scientists and engineers use the CMMS for the selection of characteristics and performance specifications for equipment, systems and natural environment factors.

- Analysts, designers and programmers use CMMS as a guide to details of the mission space components of the simulation being developed.

-- Examiners may use the CMMS to verify and validate mission space models, and as a basis for accreditation of simulation systems.

Each of these users is supported by tailored views of the CMMS Library and associated tools which have a variety of browse, locate, export and report features to access and utilize CMMS data. The CMMS Library decomposes conceptual models into fundamental data elements so that they can be combined into views supporting diverse users and their specific analytic and programmatic needs.

The present focus of the DMSO-sponsored CMMS Library is to support the integration and interchange of conceptual modeling information from the Joint Simulation System (JSIMS) Enterprise programs and the Joint Warfare System (JWARS) program. Converters are being developed to translate JSIMS and JWARS data from their "native formats" to common CMMS Library data structures.

The CMMS Data Interchange Format (DIF) provides a standard intermediate form between heterogeneous native formats and the CMMS Library. During conversion and integration, tests for referential integrity, common semantics and syntax, and the identification of redundant entities and processes are performed on the data. Cycle one of the DMSO-sponsored CMMS toolset is in alpha testing. Beta testing will begin in the near future.

The CMMS toolset is available on the World Wide Web at <http://38.241.48.7>. For additional information about the CMMS Toolset Project, contact Jack Sheehan, Technical Director, Data Engineering Group, or Michael Loesekann, Data Engineering Group, DMSO, (703) 824-3432, mloeseka@msis.dmsomil; or Tom Johnson, (703) 318-8044, x205, tjohnson@imcva.com.

13. DMSO-SPONSORED CMMS PROJECTS IN VARIOUS STAGES OF DEVELOPMENT:
EXPERIMENTS, DICTIONARY, TOOLS

Three Defense Modeling and Simulation Office (DMSO)-sponsored Conceptual Models of the Mission Space (CMMS) projects are in various stages of development as follows:

***Prototype Experiments

The prototype experiments are coming to a close at three different sites and programs. The purpose of the experiments was to evaluate the maturity of CMMS concepts and the suitability of CMMS development plans.

-- Experiment One was hosted by the Training and Analysis Command, Fort Leavenworth, Kansas and

evaluated completing a thread from knowledge acquisition to an executing application.

-- Experiment Two was sponsored by the Applied Research Laboratories, Austin, Texas and examined the CMMS capability of representing complex fire support command and control behavior.

-- The Air Combat Environment Test and Evaluation Facility (ACETEF), Patuxent River Naval Air Station, MD hosted Experiment Three. This experiment evaluated CMMS support for engineering level of detail in Joint Strike Fighter Program simulations. Experiment Three included use and refinement of new knowledge acquisition tools and methods. Preliminary results strongly support maturity of base CMMS concepts and promise to provide useful inputs to the CMMS Technical Framework Toolset project.

***CMMS Data Dictionary

This project is a continuation of completed CMMS work, converting Common Semantics and Syntax (CSS) from a feasible concept to baseline usage by the Air Force's National Air and Space (Warfare) Model (NASM) and the Army's Warfighter 2000 Simulation (WARSIM) programs. Specific activities include:

- (1) developing and executing a formal Verification and Validation Plan for the CMMS-CSS content,
- (2) analyzing Authoritative Data Sources (ADS), the High Level Architecture (HLA) Object Model Data Dictionary (OMDD), CMMS-CSS and the DoD Data Dictionary System (DDDS) for doctrine and systems relevant to WARSIM and NASM development,
- (3) extracting suitable "nouns" and "verbs" and other semantic elements for inclusion in the OMDD and the CMMS-DD, and eventual use in WARSIM/NASM Mission Space Models and HLA Federated Object Models (FOMs)/Simulation Object Models (SOMs),
- 4) mapping and matching OMDD/CMMS-DD "nouns," "verbs" and other semantic elements to DDDS lexicons as appropriate, and
- (5) identifying new lexicon items for inclusion in the DDDS.

***Knowledge Acquisition Tools (KAT)

Knowledge Acquisition Tools (KAT) are intended to address two major problems facing simulation developers:

- mission space knowledge acquired is often incomplete or ambiguous for simulation development and
- knowledge acquired is not retained for reuse.

The KAT will be fully complementary to the Joint Exercise Management Package III suite of tools, will

provide fully integrated support for the DMSO CSS, will support the key data elements (deployed to all Commanders-in-Chief) in the CMMS Common Format Database Management System (DBMS), will import/export mission space models using the CMMS Data Interchange Format (DIF), will provide automation-assisted work flow to create, and be fully compatible with, Joint Simulation System (JSIMS) Formalized Data Products. This will be a stand-alone, run-time, royalty-free desktop application.

14. AUTHORITATIVE DATA SOURCES

The objective of the Authoritative Data Sources (ADS) project is to catalog the primary data sources within the Department of Defense (DoD) that can be used to support modeling and simulation (M&S). This catalog expedites the data search process that each M&S application or exercise development event must execute. A standard set of metadata catalogs each data production source in the ADS Library. This directory is available through the Modeling and Simulation Resource Repository (MSRR) at <http://www.msrr.dmsso.mil/>.

The ADS Library project started in April 1996 and continues to expand the DoD data source catalog. The library currently contains 756 sources. Of those, the Services and DoD Agencies have designated 246 as authoritative, 179 as approved and six as other. The library also contains information on 17 subject matter experts and 11 data producing organizations. The most recent round of designation by the DoD Components is in progress; the remaining 297 sources should be designated by the end of June. The number of additional candidates that have been identified for cataloging and subsequent inclusion in the database stands at 590 and that number grows daily. The next updates to the ADS Library are due in October and will include approximately 250 additional sources. By the end of Fiscal Year 98, the core database will contain in excess of a thousand data source entries.

The Defense Modeling and Simulation Office (DMSO) has begun coordination with the DoD Data Administration Office at the Defense Information Systems Agency (DISA) with the objective of expanding the ADS catalog across DoD, not just the M&S community. The DMSO has also provided access to the ADS Library to members of the Joint Conceptual Models of the Mission Space (JCMMS) Integrated Product Team (IPT), the Joint Warfare System (JWARS), and to others within the M&S community to ensure maximum immediate benefit from the project.

For more information contact Michael Hopkins at DMSO, (703) 824-3431, mhopkins@msis.dmsso.mil; or Dave Kendrick, (757) 825-09973. The product is also available via the World Wide Web at <http://208.145.129.4/dtwg/vvc/ads/>. Or, go to the MSRR web site at <http://www.msrr.dmsso.mil> and search for "ads".

15. DAVIE

-- GOTS SOFTWARE OFFERS "POINT AND CLICK" MEANS TO DATA QUALITY

The Defense Modeling and Simulation Office (DMSO) sponsored the development of the Data Verification Interactive Editor (DAVIE) software application. DAVIE provides a "point and click" environment for end-user/subject-matter-experts to capture complex data constraints and business rules needed to establish data quality.

DAVIE is a Government-off-the-shelf (GOTS) data quality tool used to accomplish data verification edits on existing ASCII data files or relational database tables. DAVIE can be installed at sites having an existing SQL-based Relational Database Management System (RDBMS) such as Oracle TM, IBM Database 2 TM, Ingres TM, Sybase TM, Informix TM, and many Open Data Base Connectivity (ODBC)-compliant database systems. The versatility of ODBC allows common access to many different data storage techniques (such as ASCII files, X-base databases, and RDBMSs). DAVIE operates under Windows 3.1 TM, WFW 3.11 TM, Windows 95 TM, or Windows NT 3.51 TM and later.

DAVIE uses the object-oriented PowerBuilder TM environment to verify data in an internal database or data stored in other RDBMSs on a network. It operates on data in ASCII fixed-length files, data in other ASCII file formats (such as comma-separated variable and other formats), and data stored in formats such as dBase TM, Foxpro TM and Paradox TM.

The end-user/subject-matter-expert creates rules to verify the data using the simple point-and-click method. DAVIE generates the (complex) SQL statements necessary to verify the user-specified rules. The processing of those rules against the data allows the user to see rule violations by highlighting the problem record(s). The user can then send a system-generated Data Trouble Report to the responsible agent for the data and/or make on-the-spot corrections. The user has the option to update the original data file or table and to output a report showing the changes, containing a view of the original and changed data. DAVIE can also be configured to save a historical record of verification rules and can be configured to produce

statistics showing records of problems over multiple runs.

For additional information about DAVIE and how to obtain the application, contact Bob Senko at (503) 324-5036, or msfdad@msis.dmsso.mil.

16. SELF-DEFINING TECHNOLOGY REDUCES DEVELOPMENT TIME,
NEAR-TERM EFFORTS FOCUSED ON API FOR EXISTING PROTOTYPE

Data technology researchers at Georgia Institute of Technology have developed software that makes standard data formats easier to use.

Under the direction of the Defense Modeling and Simulation Office (DMSO) Data Engineering Group, a small team of researchers in Atlanta has developed a prototype system for Data Interchange Format (DIF) interface generation.

The system is designed to consume standard DIF definitions and produce code that will automatically parse and store data that has been formatted in DIF files. This system has the potential to significantly improve the long term maintainability of DIF formatted data. The Conceptual Models of the Mission Space (CMMS) Technical Framework Toolset (TFT) project will be directly incorporating a self-defining DIF generated parser/storer. It is projected for CMMS development cycle 3.

The self-defining DIF technology uses the DIF definition to create code, which parses the interchange data, and stores the data in a relational schema. Since the code is generated directly from the DIF definition, the interface development time is dramatically reduced typically within a few staff days.

The Georgia Tech team has used the current self-defining DIF prototype for several DIFs: Federation Execution Data (FED) DIF files, Object Model Template (OMT) DIF version 1.3, the Order of Battle (OB) DIF, and the emergent Federation Execution Planning Workbook (FEPW) DIF. Code can be generated for Solaris and Windows 95/NT TM. Both implementations use ORACLE TM 7.3 as a storage mechanism. Plans are also underway to develop a self-defining CMMS DIF.

The near term development efforts are centered on providing an application programmer's interface (API) to the existing prototype. A more generalized, production system is planned the next fiscal year. Although the capability to quickly generate interface code is a significant product of this effort, the technology also promises to provide techniques for simple, straightforward translation between DIF versions. The technology not only applies to DIF definitions, but also to any type of data that is described by a context-

free, regular-expression grammar. This makes the self-defining DIF technology applicable to many types of DoD and commercial data formats.

For additional information about the self-defining DIF project, contact Michael Hopkins, DMSO, (703) 824-3431, mhopkins@msis.dmsso.mil; or Thom McLean, at (404) 894-7486, thom.mclean@gtri.gatech.edu.

17. OB-DIF PROVIDES OB INFO IN STANDARD FORMAT, ELIMINATES
NEED TO UNDERSTAND MAJOR DIFFERENCES IN OB DATA SETS

The Order of Battle Data Interchange Format (OB-DIF) project is being developed by the University of Texas Applied Research Laboratory (ARL) under sponsorship of the Defense Modeling and Simulation Office's (DMSO) Data Engineering Group.

The OB-DIF provides simulation developers access to Order of Battle (OB) information in a standard format based on Department of Defense (DoD) data standards.

OB-DIF consists of three main components. They are:

- Interchange format,
- Application Program Interface (API),
- Scenario generation tool.

The "interchange format" presents OB information from several sources (U.S. and non-U.S., unclassified and classified) in a single standardized format. This format eliminates the need for simulation developers to understand the major differences between the various U.S. Service-specific and non-U.S. OB data sets. The "application programmer's interface (API)" delivers data in the interchange format. The "scenario generation tool" features a web-based graphical interface that allows users to browse OB data, edit and view individual unit information, along with personnel and equipment Table of Organizational Equipment (TOE) information. Task forces with associated personnel and equipment information can be constructed and organized easily and quickly and the resulting data set can be retrieved in the DIF format for loading into simulations.

An additional feature of OB-DIF is the ability to perform minor manipulations to extracted data. These manipulations currently include rolling up information from subordinate units into parent units and mapping individual pieces of equipment into equipment categories. These features allow simulations to run at multiple desired unit levels (company, squadron, battalion, division, wing, etc.).

OB-DIF currently accesses classified OB information from the Conventional Forces Database (CFDB) of the Office of the Secretary of Defense (OSD) Program Analysis and Evaluation (PA&E) and the Defense Intelligence Agency's (DIA) Modernized Integrated Database (MIDB), as well as unclassified generic OB data. The extraction tool features three-tier client/server architecture. Users of OB-DIF need not host and maintain the underlying OB databases.

The tool is available over the Secret Internet Protocol Router Network (SIPRNet) at the SECRET level and at <http://obdif.arlut.utexas.edu/obdif/> at the unclassified level.

For additional information about the OB-DIF program, contact Michael Hopkins, DMSO, (703) 824-3431, mhopkins@msis.dmsomil; or Lance Obermeyer, (512) 835-3837.

18. DMSO BOOTH AND DEMONSTRATIONS SCHEDULE

The DMSO participates in a number of conferences and workshops each year with an information booth and/or demonstrations of the High Level Architecture and other elements of the DoD Common Technical

Framework and Common Services. Currently planned for participation are:

- June 2-3, DMSO Industry Days in McLean, VA
- July 21-23, SIGGRAPH Exhibition in Orlando
- Aug. 10-12, AIAA M&S Technologies Conference in Boston
- Sep. 14-18, Simulation Interoperability Workshop (SIW) in Orlando
- Oct. 21-22, International Training and Education Conference (ITEC Asia) in Singapore
- Nov. 30-Dec. 3, Industry/Interservice Training, Education and Simulation Conference (I/ITSEC) in Orlando
- April 13-15, 1999, International Training and Education Conference (ITEC Europe) in The Hague, Netherlands

Take advantage these opportunities to get the latest information and look at some of DoD's key M&S projects.

19. LOOKING FOR A DATE?

Need the dates, registration information, a point of contact, the web site for an upcoming M&S conference, but don't know where you put the brochure?

Check the new "M&S Calendar" at <http://www.msosa.dmsomil/mscalendar/>

20. ASK_DMSO

Have a question about the DMSO, its programs or DoD M&S policy, but don't know who to call? Send your query to ASK_DMSO@msis.dmsomil. We'll sort it out, send your question to the right people and get you an answer.

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Director, Defense Research and Engineering
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