The SIMCI OIPT: A Systematic Approach to Solving C4I/M&S Interoperability

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ABSTRACT: *C4I to M&S interoperability is currently facilitated by software interfaces established between specific systems. The development of C4I to M&S interfaces has not been considered one of the primary design requirements for either type of system. This has led to systemic problems in using M&S systems to support C4I system testing, training & experimentation.*

The Army is addressing these interoperability issues through the Simulation-to-C4I Interoperability (SIMCI) Overarching Integrated Product Team (OIPT). The SIMCI OIPT was established in November 1999 by the Deputy Under Secretary of the Army for Operations Research (DUSA(OR)) and the Director of Information Systems for Command, Control, Communications, and Computers (DISC4) to address the lack of interoperability between Army M&S and C4I Systems. The SIMCI OIPT is Co-Chaired by US Army Simulation, Training, and Instrumentation Command (STRICOM), PM Digitized Training and Program Executive Office, Command, Control and Communications Tactical (PEO-C3T) Readiness Engineering Office (REO), and has a formal charter signed by the DUSA(OR) & the DISC4 April 2000. It reports to the Army Model and Simulation Executive Council (AMSEC). This paper provides an overview of the OIPT's Mission, Organization, Technical Vision and Programs.

In addition to describing the SIMCI OIPT Organization, this paper also investigates the factors that led to the formation of such an organization. These factors include the need to develop coordinated technical solutions that are acceptable to both the C4I & M&S communities. However, other factors, not commonly acknowledged, are in the area of Policy & Procedure – such as Certification Procedures and Coordination of Requirements. The number of systems involved is another factor, and one that the Army is attempting to deal with via such initiatives as Unit Set Fielding and Software Blocking. While SIMCI deals primarily with the Army Tactical C4I Systems, the System-of Systems context is much broader, including Weapons Systems, Communications Systems and Army Enterprise Systems.

In order to solve the problems identified above, the SIMCI OIPT has developed a strategic plan for FY03-FY09, that is based on several Reference Models and Analyses. The working assumption of the OIPT is that complete interoperability can only be addressed by consideration of several different aspects such as Standards, Architectures, Data Models and Processes.

1. Introduction

1.1 The Problem

Many Army Simulations need to interoperate with C4I Systems, such as the Army's Tactical C4I Systems, the Army Battle Command Systems (ABCS). Simulations are increasingly used to drive training and test events as well as being integrated into operational C4I systems for Embedded Training, Course of Action Analysis (COAA), and Mission Rehearsal applications.

C4I to M&S interoperability is currently facilitated by software interfaces established between specific systems. The development of C4I to M&S interfaces has not been considered one of the primary design requirements for either type of system. Most of the existing C4I interfaces to M&S have been developed as a separate component, added on after initial M&S development. Existing interfaces typically handle a small subset of the messages or data necessary for interoperability, requiring significant human intervention to achieve realism for the training audience in an exercise. M&S systems, for instance, rarely handle free text messages or consider how a message is carried (communication effects). C4I systems have been subject to different design constraints than M&S systems, resulting in different standards, message formats and protocols. Since any interface between the systems must align these differences, the interface can become quite complex. Maintenance costs for sustaining these interfaces rapidly escalate without common solutions. Interoperability and simulation infrastructure must be improved to support the Army Transformation to the Objective Force.

The problems associated with interfacing Simulations to C4I systems are well documented [2,3,6,12,15,16,27] and are not unique to the Army. Experience with the Defense Modeling Simulation Office's Modular Reconfigurable C4I Interface [11] and Data Standards [10, 13, 19, 33, 34, 35] led the Army Simulation Community to look at why it was so difficult to develop C4I/M&S Interfaces. It was found that there are intractable problems that stem from a lack of awareness of the "other" communities' approach. For example, simulations that would drive Army C4I Systems, were being developed without knowledge of C4I Data Standards [10]. Other problems resulted from inconsistent or the absence of requirements.

Thus, while the problem is manifested in software interfaces, it stems from a fundamental lack of interoperability throughout internal designs, and can only be solved by approaching the problem simultaneously in both the Simulation & C4I communities

This paper describes how the Army is dealing with this interoperability problem. As will be described, a crucial aspect of the problem is identification of all the factors required to be addressed to solve the problem. Much of the rest of the paper is devoted to this effort.

1.2 Why an Overarching Integrated Product Team?

The problem described so far cannot be solved by developing better interfaces or software products. It was recognized that there must be coordination and cooperation between the C4I and Simulation Communities, and between the various development organizations. While the cooperation between organizations could be addressed by an Integrated Product Team, two factors led to a larger organization – an "Overarching Integrated Product Team". The first was that the organization would have to bring together groups from both the C4I and Simulation Communities. The second was that the area was so broad that there might be IPTs working in conjunction with the OIPT that focused on only one aspect of interoperability. One such IPT is the AMSO-chartered Environmental Data Base IPT working on issues relating to Terrain Data Bases and Environmental Representations in M&S & C4I systems.

In November of 1999 the DUSA(OR) & DISC4 signed an "Integration of Army M&S and C4I Systems" Memo that established the SIMCI OIPT. That year, the SIMCI OIPT oversaw approximately 35 projects related to all aspects of interoperability. This was the first organization of its kind in the Simulation Community, that brought together interface developers and the C4I development Community. The unique SIMCI Organization is described later in Section 3.

The Army has strongly supported the SIMCI OIPT since 1999 and has funded it each year at approximately the same level of resources. The SIMCI OIPT has, in turn, progressively developed 3 year, 5 year and then 7 year plans that have enabled the SIMCI requirements to be considered for the Army Budget.

1.3 Roadmap to the rest of the paper

The remainder of this paper is organized as follows: Section 2 gives the Charter of the SIMCI OIPT. Section 3 describes the SIMCI OIPT Organization. Section 4 discusses the strategic plans and technical vision of SIMCI OIPT; Section 5 has a brief status of selected SIMCI initiatives; and Section 6 concludes with a discussion of the challenges that the SIMCI Organization faces as well as opportunities that are appearing.

2. The SIMCI OIPT Charter

The following three sections are from the SIMCI OIPT charter, giving the OIPT's Mission, Objectives & Functions [21].

2.1 Mission

The mission of the SIMCI OIPT is to provide recommendations on Army level policy to the Army Model and Simulation Executive Council (AMSEC) for improving interoperability between the Models and Simulations (M&S) and Command, Control, Communications, Computers, and Intelligence (C4I) Domains.

2.2 Objectives

- Seamless interoperability between M&S and C4I systems.
- Alignment of M&S and C4I standards, architectures, and common C4I components.
- Identification of requirements for simulations and C4I to support interoperability

2.3 Functions

The SIMCI OIPT:

1. Oversees development of Army SIMCI policies, plans, programs, publications, and procedures.

2. Encourages improved communication and coordination among SIMCI activities.

3. Identifies investments that have high value return in fulfilling the Army's interoperability requirements, or that fill gaps in current SIMCI capabilities. Based upon this analysis, the OIPT recommends SIMCI goals, objectives, and an investment strategy and plan to achieve them.

4. Promotes joint and cooperative research, development, acquisition, and operation of SIMCI systems, technologies, and capabilities among Army components.

5. Recommends organizations for designation as SIMCI Development Agents for general use M&S or C4I applications, as needed.

6. Fosters programs to develop and, where applicable, implement SIMCI interoperability Architectures, Standards and Interface Products.

7. Recommend Processes to Synchronize Requirements between Modeling and Simulation and C4I Systems.

3. How the SIMCI OIPT is organized

When the SIMCI OIPT was established, it was recognized that the organizational structure needed to address the involvement of two communities – C4I and M&S. This is reflected in having two chairs of the OIPT, one from each community. Both of the Chairs are from Material Developer organizations – STRICOM for Simulations & PEO-C3T for C4I. There are approximately 20 member organizations from various Army Commands, primarily dealing with simulations. This reflects a perception that C4I/M&S interoperability is currently more of an issue for the Simulation community. The SIMCI Organizational Structure is shown in Figure 1. As noted, the member organizations cover all of the different simulation domains – Training Exercises and Military Operations (TEMO), Research, Development, and Acquisition (RDA) & Advanced Concepts & Requirements (ACR). There are also other member organizations from the Army Staff. The organization's abbreviations and contact information are available on the SIMCI OIPT WWW site [21].

There are three aspects of the SIMCI OIPT that make it unique and facilitate its success. The first aspect is that collaborative nature of the SIMCI OIPT. Through OIPT Meetings and functions, it offers excellent opportunities for the member organizations to share their interoperability challenges, successes, and goals with others who are pursuing similar solutions. Another aspect is the SIMCI Council of Architects, a team of senior subject matter experts described below. The last aspect is the establishment and facilitation of selected SIMCI initiatives, such as the Certification of C4I/M&S Interfaces, and a Consortium of C4I/M&S Interfaces.

An essential component of the SIMCI OIPT organization is the Council of Architects. The Council of Architects provides the OIPT's technical direction consisting of dedicated engineering experts. They develop the strategic planning, technical vision and work with each project to ensure that SIMCI goals are being addressed. The Architect Team functions as a working group of the OIPT reporting to the SIMCI Executive, is the day-to-day manager of the SIMCI OIPT operations.

When the SIMCI OIPT was first formulated there was a deliberate effort to balance short-term efforts with long-term R&D. The result was that approximately two thirds of the SIMCI funding went to projects based on current interfaces and one third of the SIMCI funding went to R&D efforts.

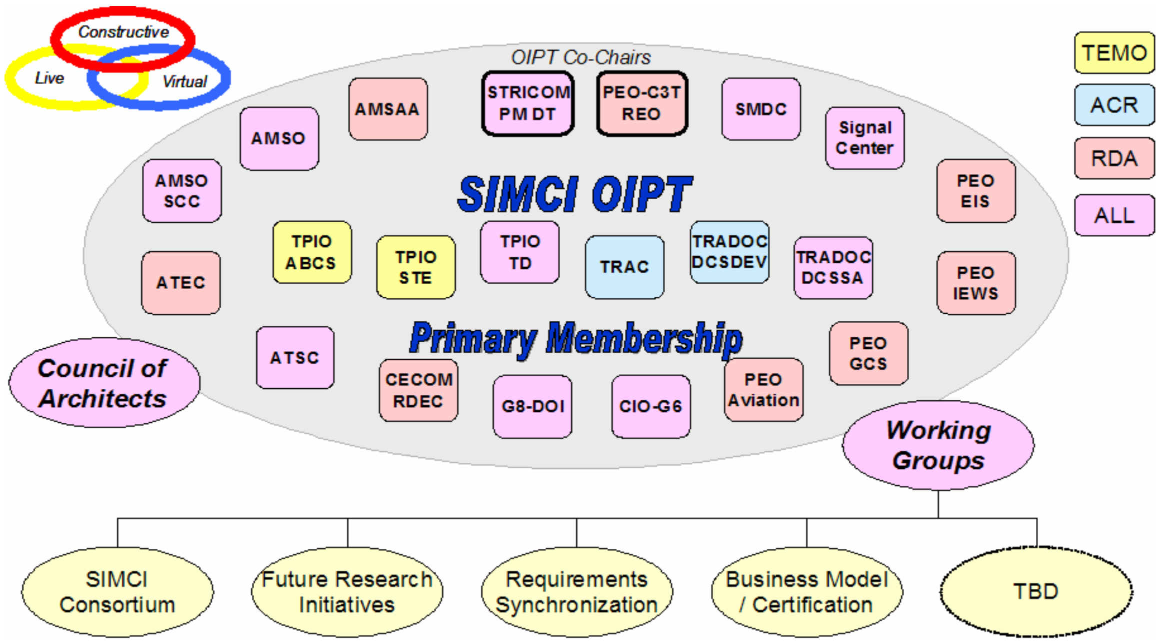

Figure 1: SIMCI OIPT Organization Chart

While the SIMCI mission is to look forward, the current interfaces must be migrated to common components and standards in order to improve interoperability. R&D efforts must be developed from an experience base, or they can easily go astray.

Shortly thereafter, a third component was added – Process. There is a recognition that if SIMCI was not involved in the on-going processes in the C4I domain, that any solutions developed would rapidly go out of synchronization. Examples of this are requirements that need to be developed and then synchronized in various programs as well as software certification procedures (very important to the C4I Community).

4. The SIMCI OIPT Vision

Much effort has been devoted to developing plans for achieving C4I/M&S interoperability. There is general agreement on the Strategic level, but the development of a detailed Technical Vision to implement the Strategic plan has been an ongoing effort as detailed below.

4.1 Strategic Plan

Figure 2 shows how the SIMCI OIPT plans to transition to a seamless interface. SIMCI has moved to the Mid-Term block of the plan. The end goal may change to more of an embedded interface in the future.

4.1.1 Software Blocking

In a broader context, the US Army is currently undergoing a Transformation to an Objective Force. One of the key initiatives complementary to the SIMCI OIPT is the Software Blocking Initiative to achieve interoperability in the C4I Community.

Achieving the goal of an integrated and interoperable war fighting capability is hampered by independent and disjointed process threads extending from requirements to fielding across individual System Developers and programs. The lack of cohesion is a result of individual system requirements that are not integrated; cost benefit analysis, testing and evaluation that are system-specific; and system developments that are program-centric.

To further complicate the already challenging system acquisition environment, the systems are getting more and more software intensive. Because of this, an Army Program Manager can not simply field his new system or system improvement to the warfighter without assessing the impact on interoperability with other systems that the warfighter may have or anticipate getting. This has been a lesson "experienced" by the Army as we have fielded digital Command & Control Systems to the 4th Infantry Division. The Army is hoping to "Learn" from the experience and transform the way that we acquire, test, certify and operationally evaluate system of systems for the warfighter – through the Army's newest Policy, Federation of Systems Software Blocking.

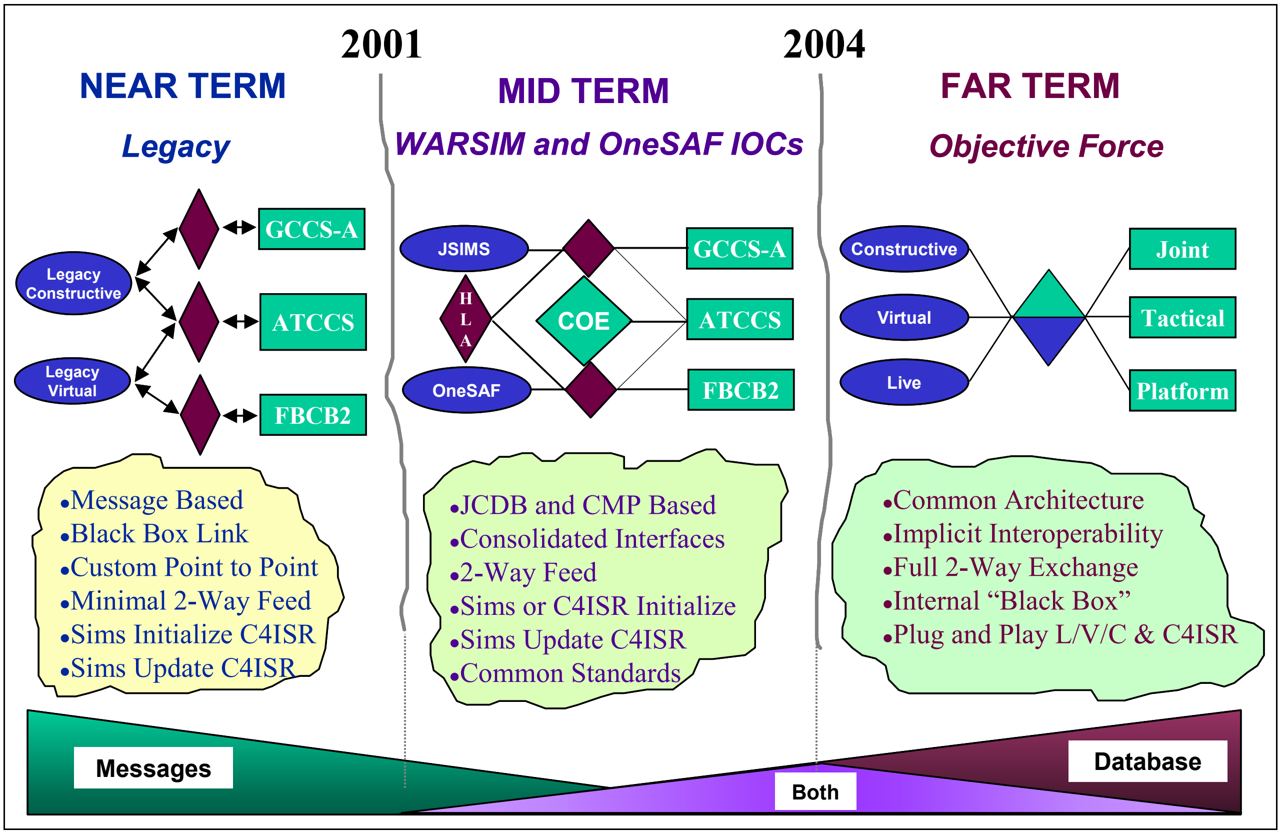

Figure 2: SIMCI OIPT Roadmap

The Army will implement Software Blocking as a means to manage the dependencies between individual system programs. Software Blocking focuses on requirement determination/prioritization, development, certification, and evaluation of an integrated System of Systems capability increment. The software blocking process complements the Unit Set Fielding process.

Software Blocking is charged with attaining schedule harmonization while ensuring interoperability among systems participating in the Block. Block 1 is comprised of 54 systems divided in three groups based upon the criteria established within the policy thus establishing the systems' need for certification and evaluation. The first group of 23 systems, Core Systems, requires interoperability testing and an operational evaluation. These systems are the focus of Block 1 management oversight during the execution phase. The 12 systems in the second group, Enabling Systems, are key to supporting interoperability of core systems. They will require certification but may or may not be required to participate in the block operational evaluation. The third group of 19 Interfacing Systems provides significant capability and receives the same oversight as the core systems. These systems are required to undergo certification, but are not required to undergo operational evaluation as a part of Block 1.

4.1.2 Strategic Context

The SIMCI OIPT exists in a context where interoperability is not only desired but required of future systems in the Army. Thus SIMCI is participating in the Software Blocking Initiative described above. However, there is an even larger context at the DOD & International level that is only being addressed by standards organizations such as the Simulation Interoperability Standards Organization (SISO). There needs to be more involvement by other "SIMCI-like" organizations in the other Services and at the Joint Level, in order for SIMCI to ultimately succeed.

4.2 Technical Vision

The technical vision is based on several constructs including a Technical Reference Model [6] and a general "House Chart" giving the elements of interoperability in the SIMCI domain.

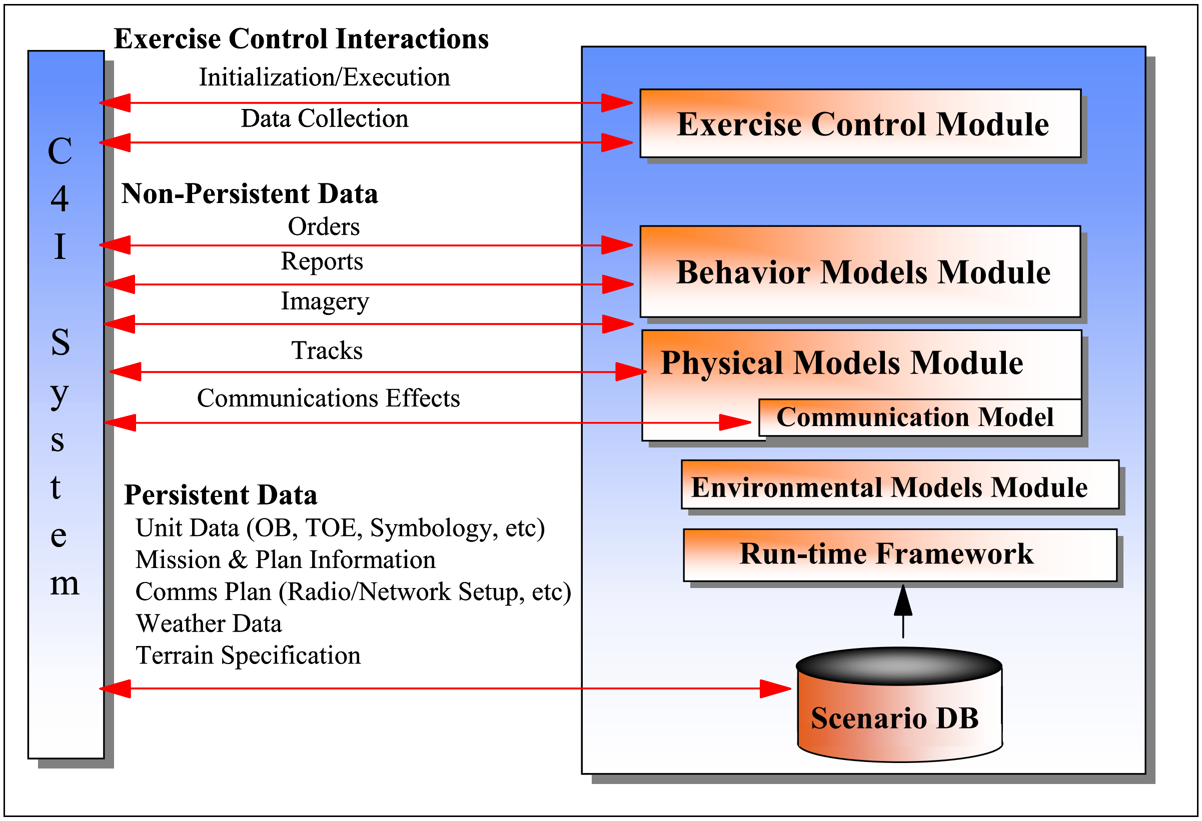

Figure 3: Technical Reference Model for C4I/M&S Interoperability

4.2.1 Technical Reference Model

Figure 3 identifies three broad classes of information containing required elements that, if satisfied, would result in full data interoperability:

Persistent Data refers to the class of information that is stored during the operation of the simulation. Information in this class is typically initialized prior to execution and changes less frequently than Non-Persistent Data.

Non-Persistent Data refers to the class of information that is transient, corresponding to interactions – during execution – between entities or objects in the simulation or C4I database, or updates to an entity's state.

A third class of information necessary for a complete interface is Exercise Control. Simulations typically have a set of protocols that allow an operator to control their execution and synchronize their operation with other simulations. Current C4I systems do not have protocols that correspond to these, however future C4I systems must have such protocols to enable them to be fully interoperable with simulations.

This Technical Reference Model and other subsequent Models are more fully described in [6,9,16,20].

4.2.2 House Chart

The SIMCI OIPT's "House Chart" is a comprehensive view of a focused effort to achieve interoperability between C4I and M&S systems. Each of these blocks is comprised of ongoing projects that strive to solve interoperability issues between Modeling & Simulation programs and C4I tactical systems.

4.2.2.1 The Processes for Alignment Block

The SIMCI OIPT's process for alignment includes managing the operational activities of the SIMCI OIPT; providing technical direction in aligning data models, architectures, and policies to increase interoperability; providing the infrastructure for Modeling & Simulation to Army C4I interoperability integration; and ensuring SIMCI requirements are synchronized

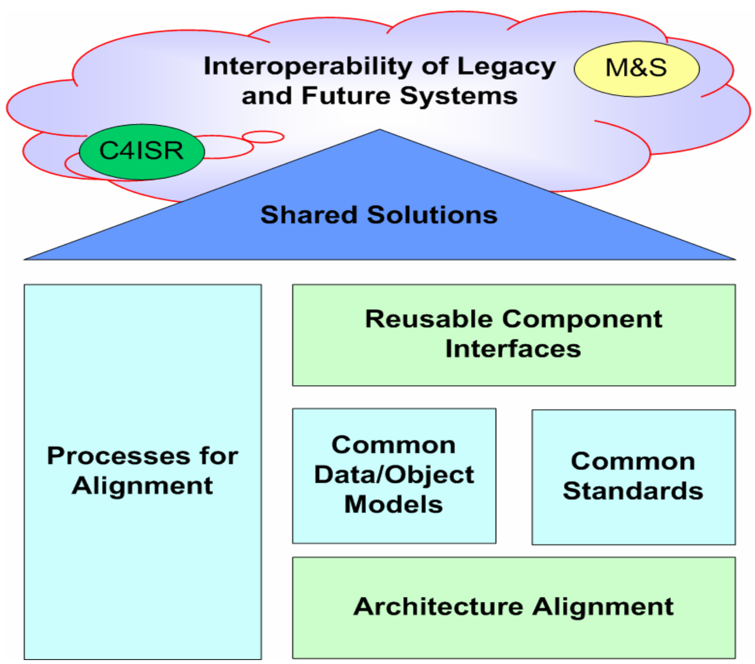

Figure 4: "House" Interoperability Chart

4.2.2.2 The Architecture Alignment Block

The SIMCI OIPT's architecture alignment effort recognizes that interoperability among multiple systems and multiple system types will require common architecture methods and solutions. The C4I community (Defense Information Systems Agency - DISA) has developed the Common Operating Environment (COE) Architecture. The simulation community has the HLA. These architectures directly impact the technical basis upon which C4I and simulation systems are built, but approach the issue from different directions.

The COE provides a framework of components organized into a layered software architecture and seeks to standardize the use of common components among COE Mission applications.

The HLA acknowledges the disparity of existing simulation systems and approaches interoperability from an ad-hoc perspective. Data and messaging exchange is built as part of the Federation Execution Process and includes semantic and syntactic translation software development for each federation.

The SIMCI Component Architecture builds upon the COE concept to combine the common components among simulation and C4I systems. The success of the SIMCI Component Architecture depends on the success of the SIMCI and Army efforts focusing in the Common Data and Standards Blocks of the House Chart. Building on such standards enables the concept of common applications and then demands an architecture within which to use those applications.

The US Army is following the lead of US businesses in using business process engineering by establishing the US Army Operational Architecture. The Operational Architecture is a business process view of the way the Army prosecutes combat operations. Since computers and communications support business processes, the Operational Architecture establishes the basis for building the computing infrastructure used by C4I systems. Since the Army spends much more time preparing for and recovering from combat actions than executing them, SIMCI is initiating a thrust to incorporate activity models of M&S supported activities of the US Army daily at work in the ACR, RDA and TEMO domains. A holistic perspective of the Operational Architecture view incorporates activity models that support before, during and after combat operations. Supporting the introduction of activity models of the Army at work for the entire spectrum of operations sets the stage for incorporating M&S *as an integral part of the Army's information systems (IS) architecture.* M&S must become part of the Army's IS architecture if it is ever to reach its' full potential in providing the Army full spectrum support before, during and after combat operations.

Consistent with the nature of architectures, executing the Alignment of Architectures block sets the stage for future M&S and C4I systems. In those future systems interoperability problems are no longer the issue.

The majority of effort will be expended increasing the power of C4I systems to harness information faster and with more lethality than all the enemies faced by US forces. Enhancing C4I systems with simulation capability together in a common architecture will play a major role in improving the information dominance of tomorrow's C4I systems.

4.2.2.3 The Common Data/Object Models Block

The SIMCI OIPT's vision of data representation strongly enforces common data representation with regard to data and object modeling. The SIMCI OIPT's oversight of this initiative allows M&S and C4I developers to use common reusable representations. The SIMCI OIPT's development oversight provides reference object models of units and material fully attributed and aligned with the data elements used by tactical C4I system developers. Another initiative develops a ("battle management") language and methodology for directly commanding and controlling simulations and future robotic Future Combat System elements utilizing a force's organic C4I equipment.

4.2.2.4 The Common Standards Block

The SIMCI investment strategy identifies a broad range of products and services that are crucial to achieving the interoperability goals of the OIPT. Key to the success of the SIMCI OIPT's long term vision is the standardization and enforcement of it's initiatives for widespread use across the Army and with the other Services.

In the current SIMCI Investment Strategy there are fifteen areas identified for standardization efforts. Some examples of the types of products and services that are planned for standardization efforts include:

- UML Object Model for M&S Developers that is aligned to the C4I Standard Tactical Data Models
- Battle Management Language
- Unit Order of Battle Data Interchange Format in ABCS 7.0
- Naming Convention for Unit Names and Equipment for M&S
- Data Collection in the COE
- M&S Elements for the Common Operating Picture (COP)
- Communications Effect Methodology and Data Elements
- Common Scenario Generation Methodology
- Simulation Inputs to the Operational Architecture
- Set of Simulation Services for the COE

Common standards are critical to meeting the interoperability goals of the SIMCI OIPT and as such are explicitly identified as a block in the House Chart. As can be seen from the sample efforts, the SIMCI OIPT will be executing standardization tasks in models, languages, methodologies, and services. The tasks conducted within the common standards House Chart block will focus primarily on standardization of these results that will have been developed and prototyped under other SIMCI tasks. Standardization tasks are intended to bring consensus among the SIMCI community and foster sharing and adoption of the technical advances achieved. Standardization efforts will be the glue that brings together the house chart components and enables shared solutions to be implemented by both the C4I and M&S communities.

4.2.2.5 The Reusable Component Interfaces Block

The SIMCI OIPT sponsors a consortium of Interfaces and Simulations in a collaboration effort to develop and share common solutions for interoperability. This effort falls under the Reusable Component Interfaces block of the House Chart.

The SIMCI Consortium is currently comprised of the Run Time Manager (RTM, an interface to Corps Battle Simulation), the Eagle Model and its associated simulation interfaces, the Command Control and Communications Driver (C3 Driver), the OneSAF Objective System (OOS), the Data Collection Module (DCM) and major components of the Digital Battlestaff Sustainment Trainer (DBST): Janus, the Extended Air Defense Simulation (EADSIM), the Fire Support Simulation XXI (FIRESIM XXI), the Enhanced Tactical Simulation Interface Unit (eTSIU), the Enhanced Protocol Interface Unit (ePIU), and the SimC4I Interchange Module for Plans, Logistics, & Exercises (SIMPLE).

The Consortium is taking the approach of integrating ABCS components into Simulation Interfaces to improve interoperability. Called "Foundation Products", these components are part of the DISA's COE. Components used by the Consortium include: the Common Message Processor (CMP), the Command and Control Registry (C2R), and the Ground Tactical Communication Server (CommServer) [28].

Consortium members are also integrating the Joint Common Database (JCDB) into their interfaces. By using Application Program Interfaces (API) to the JCDB they have been able to stimulate ABCS systems by inserting data directly into the JCDB and allowing ABCS Foundation Products' own data replication processes such as Subscribe and Receive (SR) and the Wireless Distribution System (WDS) promulgate the data within the ABCS systems contained inside and between Army Tactical Operation Centers (TOC).

Consortium member systems using these integrated solutions are currently supporting major Army training events where ABCS is being used such as; the Digital Capstone Exercise (DCX) I & II, Prairie Warrior, Millennium Challenge 02, and various National Training Center (NTC) rotations by elements of the U.S. Army's 3rd Corps (III Corps).

5. Status of Selected SIMCI Initiatives

SIMCI sponsors many different projects. Two of the projects are highlighted below: A long-term research effort to define a Component Architecture and a short-term data modeling project designed to improve M&S interfacing to the current version of ABCS.

SIMCI has developed a SIMCI Component Architecture (SCA) and is continuing to refine this Architecture [23]. First, a single component of the SCA is to be explored with a project on common Scenario Generation for simulation and C4I systems. Second the SCA will be further detailed with multiple analyses whose purpose is to define the uses, component interfaces and allocation of functionality of the constituent components.

Scenario Generation is currently executed in C4I and simulations in support of training exercises throughout the US Army. The difficulty in developing and implementing training plans lies in no small part with the tremendous amount of data manually entered, checked and corrected as part of training scenarios associated with multiple sets of simulations, interfaces and C4I systems. Multiple data sets accompany different configurations, hampering the exchange of scenarios between training events. SIMCI's Scenario Generation project seeks to identify methods for synchronizing data in today's training events as well as providing a perspective on how to homogenize the data between future simulation-enhanced C4I systems supporting Course of Action (COA) development. FY 2002's efforts will fix community direction on this subject to support FY 2003 projects intended to define and prototype methods for using single source data for both C4I and Simulation Systems.

The SCA will be further developed to better guide future efforts in components common to both C4I and simulation systems. This effort will utilize the Object-Oriented based analysis method developed in FY 2001 [23]. Once completed, the SCA provides a basis for other components to be built that are required to enable the simulation-enhanced C4I systems of the future. The SCA development accounts for both embedded and umbilical simulation support of C4I systems.

For the short term project in FY02, the SIMCI Consortium in conjunction with Systems Engineers from the Central Technical Support Facility (CTSF), Ft. Hood, TX and engineers from the Defense Modeling and Simulation Office (DMSO) are developing the Repository of ABCS Data (ROAD). ROAD will be used to initialize both ABCS systems and Army simulation systems. As a first step the ROAD will initialize these systems with data elements that are common to all, such as, Unit (ex. UTO, unit associations, unit initial conditions, personnel types, personnel quantities and material) and Communications Structure data. Within ABCS systems, these data elements will be used to initialize the JCDB, the Force XXI Battle Command, Brigade and Below (FBCB2) database and the Lightweight Directory Access Protocol (LDAP) Data Interchange Format (LDIF). Simulation systems will also be part of ROAD and two have been chosen to be the stimulators for the upcoming Maneuver Control System (MCS) / FBCB2 / Integrated Systems Control (ISYSCON) V4 Initial Operational Test and Evaluation (IOT&E). The use of ROAD during this event is the final deliverable of this years work program.

6. Conclusions

We conclude with a discussion of SIMCI's Outreach efforts and identify some of the major challenges that SIMCI will face in the future.

6.1 SIMCI Outreach

SIMCI has made a conscious effort to widely publish its findings and influence other programs and organizations to adopt the standards it has developed.

The majority of the papers in the References [Section 8] were sponsored by SIMCI. Projects sponsored by SIMCI are requested to prepare reports on their programs, and publish their results when they have reached an appropriate point. Publication is considered when evaluating programs for renewal.

In addition to encouraging distribution of results by publication, SIMCI co-sponsors a Semi-Annual Technical Exchange to ensure current awareness of the work done by the SIMCI community. These have proved to be very valuable in the Army Interface Community in both ensuring that programs stay current and also to motivate programs to adopt SIMCI standards.

6.2 Challenges

The Army faces many challenges in the future in the area of C4I/M&S Interoperability. Three are identified here. The first is bounding the problem space. SIMCI was established to deal with the problems of interfacing to Tactical Army C4I Systems. But the problems in this area cannot be completely solved without working out interoperability issues with Weapons Systems, Communications Systems and others. However, the SIMCI OIPT does not have the resources to deal with all of the Systems involved in Software Blocking. An approach needs to be developed that clearly states what SIMCI 's responsibility is to avoid "mission creep".

A second, related, problem is the problem of Joint operations. While the SIMCI OIPT can solve the C4I/M&S problem in the Army Domain, it is not chartered to solve other Services' or Joint Interoperability problems. However, if the other Services do not have SIMCI-like organizations, it is very difficult for SIMCI to work with individual Service programs to develop coordinated solutions. The DoD OSD sponsored Information Superiority M&S Master Plan may provide one mechanism for coordinating the Services.

A third challenge is the issue of changing programs and technologies. The military sector is struggling to keep up with commercial Information Technologies. The development plans for ABCS and FCS C4I systems are evolving rapidly. Perhaps the main mission of the SIMCI OIPT is to ensure that these plans are communicated to the M&S community and that a flexible approach is taken to be able to adapt to new directions in the C4I Community.

The SIMCI OIPT has been in existence for three years and has sponsored approximately 50 projects. We have described why an OIPT is needed and how the OIPT operates, rather then focus on the accomplishments. The results of the OIPT can be judged by referring to the papers in the following reference section. This gives a review of some of the various projects sponsored by SIMCI. We conclude with a call for more effort on developing a coordinated approach to solving C4I to Simulation interoperability within the US DoD and International Community.

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