

**LOGISTICS TRANSFORMATION:
NEXT STEPS TO INTEROPERABILITY
AND ALIGNMENT**

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LOGISTICS TRANSFORMATION: NEXT STEPS TO INTEROPERABILITY AND ALIGNMENT

EXECUTIVE SUMMARY

Policy and vision documents declare interoperability to be the “foundation of effective joint, multinational and interagency operations.” Achieving that vision has been challenging and logistics leaders have raised a number of issues in discussing next steps to achieve jointness in logistics.

Fifteen logistics transformation experts shared their views on the ‘as-is’ and ‘to-be’ states in joint logistics transformation. They are all leaders and senior managers with both broad policy perspectives and often deep technological and business process knowledge, along with decades of logistics and war fighting experience. The fifteen experts discussed the following topics:

Programmatic Topics

- A historical view in the progress of logistics coordination and interoperability
- Barriers of existing funding mechanisms
- Barriers of Title 10 to joint logistics support systems and interoperability
- The need for Office of Secretary of Defense leadership and standards
- Organizational restructuring

Constructive Topics

- Lessons from Operation Iraqi Freedom – scalability issues
- Interoperability and Data Integration – challenges and cases
- Centralized versus decentralized approaches for joint logistics transformation

Operational Topics

- The warfighter's view of logistics transformation
- Training, lost learning and succession planning
- Change management

Several participants recommended that a ‘4 Star’ Logistics Combatant Command (USLOGCOM) be created to consolidate DoD logistics and supply chain functions, even if this requires clarifying Title 10. They also recommended that interoperability be funded and required as part of the logistics systems acquisition process. A central business process model of the ‘as-is’ logistics enterprise is required, but different war planning scenarios may require multiple ‘to-be’ logistics business process models. The USLOGCOM, once created, will need to act as an ‘honest broker,’ and sometimes as a ‘sheriff’ among individual Services and Agencies, to enforce interoperability and business process alignment.

THE PROBLEMS OF JOINT LOGISTICS ALIGNMENT AND INTEROPERABILITY

Policy and vision documents declare interoperability to be the “foundation of effective joint, multinational and interagency operations.” Achieving that vision has been challenging and logistics leaders have raised a number of issues in discussing next steps to achieve jointness in logistics. Joint logistics capabilities require interoperability across programs, systems and forces. Many programs detailed in this paper are beginning to meet this requirement, but at the moment, interoperability is piecemeal at best.

Many participants in earlier Lexington Institute Logistics Working Group meetings raised concerns about these gaps in interoperability and alignment in logistics transformation initiatives. Potential gaps occur at all organizational and system interfaces, between the Department of Defense (DoD) architecture framework, the Joint Agency architectures, and the Services’ architectures. Participants also raised concerns about a lack of common business processes, untested interoperability between applications including Enterprise Resource Planning (ERP) applications, and incompatible databases in both legacy logistics support systems and new systems in development.

A range of DoD and related organizations are attempting to define the problem, provide solutions, and build interoperable systems (see Appendix 2). Recent commitments to Service Oriented Architectures (SOA) and web services by Defense Information Systems Agency (DISA) may provide an easier technology platform for interoperability in the next five years, during which individual Services and Agency logistics transformation projects will also finally be completed and upgraded. In fact, in the next decade, the technological changes required to integrate logistics systems may well be achieved much more rapidly than the organizational changes required to operate those systems for joint logistics support. For example, DISA’s SOA web registry may soon enable DoD managers to exchange, with relative ease and even security, timely logistics information between the Air Force’s Oracle ERP system and the Army’s SAP ERP system. However, those same DoD managers may encounter more difficulty in changing their organizations and defining common business processes for integrated logistics across the Air Force’s and Army’s supply chains for particular war fighting scenarios. The ‘how’ of logistics interoperability is rapidly becoming feasible and even implemented; but the ‘what, who and why’ are still in early stages of negotiation.

Yet DoD leaders generally agree on the shared benefits of making their ongoing logistics transformation projects interoperable, though some may feel they will have to bear a disproportionate cost. These benefits of interoperable logistics systems and business processes include:

- Known and shared readiness of forces
- Decreased operational footprint in the theater of operations
- Increased agility and survivability of the force
- Decrease in logistics demand which would decrease the overall cost of employing the force
- Improved data management and data integrity
- Total Asset Visibility, including assets of other Services and Joint Agencies

- Improved end-to-end management allowing for real-time control
- Increased force projection and force sustainment
- Ability to participate effectively as one element of a unified national effort in the unpredictable environment of the future
- Increase the speed and effectiveness of theater opening tasks

In order to understand these benefits and problems in logistics transformation interoperability and jointness, in-depth interviews were conducted with fifteen leaders from the DoD, Services and Agencies (Defense Logistics Agency, TRANSCOM, etc.). The discussions were modeled in part on an earlier study conducted in 2003 by Carnegie Mellon University's Software Engineering Institute (SEI), the *System of Systems Interoperability (SOSI)* study on interoperability.¹ Although the earlier SEI study looked at interoperability across all DoD domains, not just logistics, it identified ongoing problems relevant to logistics transformation, including:

- Classification of the interoperability problem space
- Work with others toward a complete and consistent set of interoperability models
- Understanding of ramifications of net-centric warfare from a software and systems perspective
- Analysis of emerging technologies
- Planning for migration and incorporation of legacy systems
- Analysis of existing and new acquisition regulations and policies
- Identification of barriers

We discussed these 'as-is' issues and 'to-be' concepts in logistics transformation in semi-structured interviews with fifteen logistics transformation leaders and experts. To provide an additional perspective beyond the technical focus of the earlier SEI study, we interviewed leaders and senior managers who had both broad policy perspectives, and often deep technological and business process knowledge, along with decades of logistics and war fighting experience. Notes from the interviews were submitted back to the experts for validation and verification, and are included in Appendix 1. These expert comments were then organized by topic area, in the three interoperability categories defined in the original 2003 SEI *SOSI* Model for Interoperability: Programmatic, Constructive and Operational.²

Programmatic topics include organizational change and activities performed to manage the acquisition of logistics transformation systems, e.g. planning, contracts, budgets, incentives and risk management. Constructive topics include activities performed to construct and sustain logistics transformation systems, e.g. architectures, standards and commercial-off-the-shelf (COTS) product interoperability. Operational topics include any activities to operate a logistics system, focusing on interactions with other systems and with users.

For this paper, discussions with fifteen logistics transformation leaders brought out many unresolved issues in logistics interoperability, for example:

Programmatic

- Does new legislation need to be written to eliminate Title 10 barriers to interoperability and to a joint approach to logistics transformation? How fragile are agreements to exchange data, employ horizontal processes, share operating environments, etc., when transformation leaders may depart for new positions, or retire?
- If jointness, alignment and interoperability of logistic systems are so crucial, why does DoD management either ignore or perpetuate so many disincentives – organizational, contractual, budgetary, cultural and technical – that create great difficulties in achieving logistics interoperability?
- Why are resources dedicated to interoperability often minimal, or merely implied as a non-funded future requirement for a logistics support or ERP system? Is the problem a lack of consensus, a lack of technical understanding, or a policy assumption that interoperability is an inherent property of systems that ‘just happens’?

Constructive

- Why should over-extended teams building massively complex ERP Systems of Systems coordinate with the initiatives in Office of the Secretary of Defense (OSD), J4, DLA and TRANSCOM, when they perceive interoperability requirements as a largely unfunded risk to completion of their own programs? If a project team extended a deadline to implement a functional requirement on their Service’s logistics system, in order to comply with a joint interoperability functional requirement, would they be rewarded or penalized by today’s logistics transformation managers?
- How are current logistics transformation efforts, such as the Global Combat Support System Family of Systems (GCSS-FoS), succeeding in addressing interoperability requirements, given competing ERP platforms that may only interconnect with significant effort? Is there a vendor-staffed Oracle-SAP team resourced and dedicated to defining common objects, processes and connectors and actively prototyping them? Are individual logistics transformation projects using new standards such as the Business Process Execution Language Version 2.0 (BPEL), Supply Chain Operations Reference Model Version 7.0 (SCOR 7.0), or DISA’s Web services registry for SOA, in order to make integration easier?
- Should common processes, architectures and data elements be defined ‘top-down’ to achieve interoperability, or should alignment be selectively developed ‘bottom-up’ on an ad-hoc basis between the Services and Joint Agencies? Given that both approaches are occurring, what war fighting scenarios are being used for a Design Review of the emerging de facto multi-path system of systems?
- Can a business process model be constructed of the Joint, Services and Agencies supply chain, extending beyond the current TRANSCOM and DLA distribution process model? Can this model be an ‘as-is’ inventory of current logistics processes in all Services and Agencies, even though these are rapidly changing, or should it be a ‘to-be’ model of the future joint logistics enterprise? Who should own this integrated supply chain process – an expanded set of responsibilities for the current TRANSCOM Distribution Process Owner (DPO), or a new Logistics Command?

Operational

- If both top-down and ad-hoc interoperability are consciously designed, and each can only be partly achieved, what joint logistics capabilities will be beyond beta testing in 2010 and 2020?

This clustering of expert opinion provided an understanding of differing viewpoints, and some areas of consensus. The fifteen experts raised the following topics in discussing the problem of joint logistics transformation:

Programmatic

- The Historical View: Progress of Logistics Interoperability and Cooperation
- Barriers of Existing Funding Systems, Budgeting and System Acquisition Regulations
- Barriers of Title 10 to Joint Logistics Support Systems and Interoperability
- Need for OSD Leadership and Standards
- Organizational Restructuring Required for Joint Logistics Transformation

Constructive

- Lessons from OIF and Scalability Issues in Logistics Transformation
- Interoperability and Data Integration – Challenges and Cases
- Decentralized, Less Joint, Locally Focused Business Processes, Programs and Transformation Strategies
- Centralized, More Joint, DoD Focused Business Processes, Mapping, Metadata and Transformation Strategies

Operational

- The Customer/Warfighter View of Logistics Transformation – Demand Forecasting, Information Assurance
- Training, Lost Learning and Succession Planning: Personnel
- Change Management

1. Programmatic Issues and Concepts in Joint Logistics Transformation

1.1 The Historical View: Progress of Logistics Interoperability and Cooperation

Several experts emphasized that logistics and supply chain management have made significant progress in the last decade, and that cooperation between the Services and Joint Agencies has improved greatly in the last five years. Ignoring the strengths of the current logistics services could be as risky as ignoring their weaknesses. As Vice Admiral **Lippert** noted, “The statement that the DoD logistics system is broken is inaccurate. The issue needs to be placed in historical context. When the U.S. military went into Afghanistan and Iraq, the forces were sustained.... Progress has been made with regards to asset visibility, requisition, and distribution. Most logistics initiatives are in place or in development.” Others reinforced the view that recent progress needs to be acknowledged as a foundation for next steps in logistics transformation.

Progress in Compliance with Joint Initiatives: Mr. **Bennett** suggested that “a historical perspective is important to understand how far logistics has already been transformed. Oversight of compliance with joint requirements is far more extensive than 10 years ago. DoD has adjusted to more robust requirements for jointness in logistics management.” Mr. **Erb** was also optimistic, especially on emerging data sharing agreements. “Everyone in the Services and Joint Agencies agrees that logistics interoperability does not yet exist, except in isolated cases,” he noted. “But the current state is far better than even the recent past. Full integration probably will never occur for all processes. Four years ago, Services logisticians refused to share much of their data. Since then, senior logisticians have agreed that corporate data need to be shared, and now the logistics community is in the first phase of executing that agreement.”

Historical Realism and Managing Expectations: Participants noted the improbability of achieving ‘total’ performance metrics in any area of logistics, such as Total Asset Visibility. Vice Admiral **Holder** noted that “Some hole in the logistics supply chain will always exist; 100% performance will never happen.” Colonel **Ruark**'s team noted that in any new warfare environment, “the materiel will likely always get out ahead of the RFID (Radio Frequency Identification) readers,” until the environment can mature. Experienced logisticians expect even the best designed and tested systems to break, and therefore they plan for back-up plans, processes or component (and possibly non-integrated) systems.

History of Proprietary Systems as Barrier to Interoperability: General **Kern** suggested that the central logistics system interoperability issue today is similar to “that faced by the U.S. government from the Civil War to the early 1900s, when they wanted to build guns with interchangeable parts from different vendors. The vendors wanted to sell guns that did not have interchangeable parts, so they could be the sole suppliers. It took decades to achieve a degree of interchangeable parts in weaponry. Today’s Winchester and Colt rivalry is the competition between Oracle and SAP. A barrier is the issue of intellectual property rights.” Additional discussion of connectors, or web services shared between Oracle and SAP is below in section 2.3.

1.2 Barriers of Existing Funding Systems, Budgeting and Systems Acquisition Regulations

Jointness in logistics transformation is succeeding in policy efforts at the top, and in isolated tactical ad-hoc innovations on the battlefield. However, to institutionalize logistics interoperability across the Services, funding is required that is dedicated to that purpose. In the 2003 SEI study, DoD managers mentioned contradictions between the objectives of interoperability and the current DoD funding model and incentives. Interoperability is often an ‘unfunded mandate.’ Lieutenant General **Cuviello** observed that “Present day industry contracts take advantage of the lack of coordination, all funding legacies without a point of convergence. For example, GCSS (Global Combat Support System) is a system of legacy systems without adequate horizontal integration. PPBS itself supports a stovepipe approach to system sustainability.” SEI investigators had similarly noted that contractors have no requirements incentives to tie a program's success to another program's successes.³ Interoperability, especially to a competing vendor's system, is often deferred to an ever-receding later milestone. Vice Admiral **Holder** noted the same problem with stovepipe funding for horizontal goals: “The status quo financial system is the wrong set up. We need to bring AT&L (Acquisition, Technology and Logistics) money up to one individual so that it is brought top down and then horizontally integrated across systems, rather than stovepiped.” Colonel **Burke** also noted the funding alignment problem. “No programmatic incentives are in place to push service organizations to align along shared domains and processes. That’s not how we resource programs or departments.”

1.3 Barriers of Title 10 to Joint Logistics Support Systems and Interoperability

Title 10 language gives some logistics responsibilities to the OSD, and others to the Services. OSD has limited enforcement powers over the Services' logistics organizations. The Under Secretary for Acquisition, Technology and Logistics can establish policies for logistics. The Deputy Under Secretary of Defense for Logistics and Materiel Readiness can provide guidance to, consult with, monitor and review logistics operations in the Services and DoD Agencies. This language can be interpreted broadly or narrowly. Therefore, some participants felt that Title 10 limited the amount of joint activities in logistics. Mr. **Aimone** stated that Title 10 “defines clear responsibilities for the individual Services to handle logistics, which is one of the inhibitors to a completely integrated and joint logistics system.” Lieutenant General **Cuviello** also saw Title 10 as a limit on TRANSCOM as an organizational model: “The TRANSCOM model cannot become like SOCOM model because it would violate Title 10 Service responsibilities and people would not come on board.” Major General **McManus** envisioned the need for revisions in Title 10: “There may have to be some kind of adjustment to Title 10 to permit logistics coordination at a higher level than just the Services.” Alternatively, General **Kern** cited precedents where Title 10 had not acted as a constraint: “Title 10 is not necessarily a barrier to high-level coordination of logistics transformation. For example, medical and transportation processes are managed more horizontally than logistics. Title 10 can give Congress the ability to leverage change. On the other hand, it can also be used as protection from change for the Services and the Congressional Committees.”

1.4 Need for OSD Leadership and Standards

Many participants strongly expressed a need for more OSD leadership in actual implementation of logistics interoperability and cultural change for joint logistics transformation. The original 2003 SEI study had also suggested that leadership direction and policy was a problem, due to a lack of centralized or coordinated ownership for the problem.⁴ Lieutenant General **Christianson** suggested that “Services and Joint Logistics Agencies need to use a common data architecture, defined by OSD. They need to share a Common Logistics Operating Environment.” Lieutenant General **Cuviello** stated that “The status quo transformation process lacks adequate oversight and control, from either the Joint Staff or the OSD, resulting in little substantial coordination and more stove pipes and no enterprise solution. The NII is not adequate; it is only effective around policy and process.” Vice Admiral **Holder** was even more emphatic: “We need absolute directive authority for logistics transformation from the OSD.... Logistics transformation needs to be generated from OSD with outsourcing to an independent integrator. DoD needs to be constantly involved to avoid backlash and false views of ‘it won’t work.’” General **Kern** saw the OSD role as key to cultural change: “Change management to overcome culture needs to be top-down, coming from OSD and Joint Staff, since it is most effective if they do it together,” with similar suggestions from Major General **McManus** and Vice Admiral **Lippert**.

Although participants wanted more vigorous management leadership from OSD, it was noted that significant technical initiatives are underway in the Logistics Domain within the DoD Business Management Modernization Program (BMMP). The BMMP manages the Business Enterprise Architecture (BEA-Log), a process-oriented set of models and objects that describe the Future Logistics Enterprise. Agencies are using the BEA-Log; for example, aligning with the BEA-Log has been one of TRANSCOM's goals as it built out its own process models and enterprise architecture. Version 3.0 of BEA-Log was released in October 2004, with updated system, technical and data views. Unfortunately, the BMMP's non-technical activities were judged to be less useful. Mr. **Nyere** stated that “the Business Management Modernization Program, in the last few years, has not focused on projects that would provide short-term Return on Investment for the Warfighter. In fact, there may have been no identifiable contribution for the warfighter. Now the program is being realigned to focus on support for the warfighter.” He described this new view of DoD business management as based on five horizontal processes: personnel management, weapon system lifecycle management, real property and installation lifecycle management, materiel supply and service management, and financial management.

Other OSD efforts include:

- Open Systems Joint Task Force, to encourage multiple-vendor common interfaces based on open standards
- Defense Information Infrastructure Common Operating Environment (DII COE), an open architecture with eight levels of interoperability compliance
- Joint Interoperability Test Command, which provides a database of tested configurations

- Joint Technical Architecture, which offers standards for information or application services exchanges across organizational or functional boundaries.

These OSD efforts are useful, but the simple existence of common standards like the DII/COE does not make interoperability a done deal. As noted in the 2003 SEI study, “Too often, the approaches used lead to interoperability that is specific to the targeted systems (sometimes called ‘point to point’) and do not facilitate extension to other systems. Even then, the technical approaches employed, such as DII/COE and XML offer only partial interoperability...Contractors sometimes prefer standards/policies like DII/COE or the Joint Technical Architecture (JTA) because they are easier to satisfy by ‘checking a box’ instead of having to solve the interoperability problem.”

1.5 Organizational Restructuring Required for Joint Logistics Transformation

Experts disagreed as to whether a single Logistic Command was needed, with reservations expressed particularly by Air Force, Navy and Marine logistics managers. Army, DLA, and TRANSCOM staff generally supported the idea of an authoritative USLOGCOM. Proposals for a single Logistics Command have been issued within and without DoD for years. In 1995, the Commission on Roles and Missions recommended the formation of a Logistics Command. A 1999 CRS report noted that: “With a twenty-year outlook, the National Defense Panel (NDP) made recommendations for transforming the Unified Command Plan (UCP) to create a Logistics Command to provide global logistics, transportation, and asset visibility operations (combine TRANSCOM and the Defense Logistic Agency).” In the same vein, in 2003, an OSD official noted that “simply combining TRANSCOM and DLA would not be addressing the entire supply chain, but only one supplier and the transportation provider, rather than all the suppliers.”⁵ General **Kern** stated the general principle that “We need a central plan for all of DoD logistics, showing how we get there, pulling all these systems, the comptroller, acquisitions and logistics communities, under a single program office.”

This trend towards central direction is cited in the Center for Strategic and International Studies (CSIS) Report *Beyond Goldwater-Nichols*, which criticizes the lack of doctrinal lines of authority in “the current proposal for rationalizing the fragmented governance of the logistics community... a Joint Logistics Board, co-chaired by the Deputy Under Secretary for Logistics and Materiel Readiness and the Joint Staffs Director of Logistics (J-4), with a core membership of twelve key suppliers across the services and commands.” The CSIS report recommends merging J4 with the Deputy Under Secretary of Defense (Logistics & Materiel Readiness), with a USLOGCOM that combines TRANSCOM’s three major transportation components and DLA’s forward supply depots under one functional, four-star command. The report notes that joint doctrine would have to be revised to define “where in the supply chain the USLOGCOM would hand over distribution responsibilities to the regional COCOMs and Service distribution systems.”⁶

This issue – the authority of any new LOGCOM over Services and regional COCOMs – was the subject of extended discussion in the Logistics Working Group meetings. Several participants wanted a stronger enforcement mechanism for achieving joint logistics results. Citing the CSIS study’s recommendations, Vice Admiral **Holder**

mentioned that “This was an interesting concept, but didn’t allow for continuing direct access to CJCS. We need absolute directive authority for logistics transformation from the OSD...We need an enforcement document that actually has an enforcement mechanism.” Major General **McManus** also cited the need for an enforcement mechanism: “If you are in a joint billet, you depend on the voluntary collaboration of the Services membership. You can support jointness currently, but you cannot require it. There is no enforcement mechanism.” Lieutenant General **Dail** also wanted an enforcement mechanism: “There needs to be a centralizing authority, through a DoD directive that would be the guiding manager offering a top-down, strategic based vision to overcome all the stove-piping occurring with the multitude of transformation initiatives within each of the Services. Having the authority to enforce the requirement for new systems, platforms, interfaces, etc. in the logistics system to link into a centrally managed scheme and is visible across the entire supply chain.”

Although many experts had positive comments about the Joint Logistics Commands, some raised concerns that further organizational restructuring is required. As Lieutenant General **Cuviello** said, “The current organizational construct of TRANSCOM or DLA is not the obvious choice for the lead Combatant Commander or JTF for logistics, because of process, cultural and budgetary barriers. The current DDOC and Theater Operations Centers are not the panacea making the process better because they are just an additional level of operations center that does not rid the system of duplications. No single office currently has a comprehensive view of all logistics capabilities and initiatives across the Services or DLA.”

Given the perceived need to have that single office with a comprehensive view, several participants recommended the creation of a “4-Star Combatant Commander for logistics ...equivalent in the chain-of-command to STRATCOM, to harmonize logistics management at the national level,” as stated by Lieutenant Colonel **Burke**. Several participants cited the STRATCOM model as the preferred level of authority for a logistics Combatant Commander. Lieutenant General **Cuviello** noted that the model might be valued by the Services logistics commands. “Ideally, there would be a Combatant Commander in charge, following the example of the redefinition of C4ISR, and STRATCOM and DISA. There is a clearly defined working relationship with Joint Forces Command that is responsible to make the requirements to solutions and operations process work. The Service ‘6s’ support the new status because they have a 4-Star Combatant Commander to fight for their interests from end-to-end and a clear chain of enterprise command. STRATCOM is a good model because of the experience there of a fully empowered commander able to encourage, and sometimes force change in spite of organizational resistance.”

STRATCOM, the U.S. Strategic Command, as presently constituted reflects the merger of the former U.S. Space Command with the old U.S. Strategic Command on October 1, 2002. The command currently oversees (1) strategic command and control, (2) global communications, (3) national missile defense, (4) space operations, (5) information operations, and (6) intelligence, surveillance and reconnaissance. This is a unique combination of roles, capabilities and authorities under a single unified command, and the organization is still learning how to collaborate.

Technical Note: An Alternative Approach to Managing Complex System of Systems

The SEI and others have recently raised a caveat about the uses of central control to achieve interoperability. Discussions of interoperability in complex Systems of Systems tend to highly value organizational hierarchy, centralization, authority, and standardization, because those principles are needed to force all those disparate systems and system components to align. You need all the authority you can get when you're herding cats. But we are only beginning to understand the possible unintended consequences of over-engineering complex Systems of Systems. Recent thinking about interoperability in complex 'unbounded' systems, such as the Joint DoD Focused Logistics Enterprise, points out the potential fragility of any centralized, hierarchical structure. The SEI team has observed that "When problems of interoperability arise in complex systems, there is a tendency to try to gain greater visibility, to extend central control, and to impose stronger standards. Not only are these actions ineffective in complex systems, they also increase the likelihood of certain kinds of accidents, user errors, and other failures.... Developers of Systems of Systems should strive for loose coupling."ⁱ

Similar recommendations for 'loose coupling' have been made by Booz Allen Hamilton supply chain planning staff with their 2001 concept of 'Federated Planning' for System of Systems collaboration.ⁱⁱ IBM and the Air Force have also developed the 'federated systems' approach for handling supply chain complexity. In federated planning, companies in a supply chain hold discussions to align their business objectives, before collaborating. Through ongoing dialog, supply chain partners understand each others' critical constraints and cost drivers. Because the dialog is ongoing, when conditions change supply chain partners can renegotiate agreements on performance metrics, incentives, business rules and processes.

DISA's Net-Centric Enterprise Services (NCES) Program to provide a registry of Web services will be a partial technical solution to the SEI "loose coupling" recommendation. The NCES registry is cataloging hundreds of Web services developed by the Services and Agencies, and it will be the core of the DoD's SOA, with logistics users planned as early adopters. The GCSS ERP systems being implemented by the Services use software from SAP and Oracle that can be made interoperable through the NCES registry and underlying architecture.ⁱⁱⁱ

Additional discussions on centralized and decentralized models for jointness in logistics are below in Section 2, 'Constructive Issues and Concepts.'

ⁱ Fisher, David and Smith, Dennis. "Emergent Issues in Interoperability." *Eye On Integration*. Number 3, 2004. Page 2.

ⁱⁱ Oliver, Keith, et al. "Beyond Utopia: The Realist's Guide to Internet-Enabled Supply Chain Management." *Strategy + Business* (Booz Allen Hamilton). Second Quarter, 2001.

ⁱⁱⁱ Interview with Robert Vietmeyer, Chief Engineer, DISA NCES. May 17, 2005.

2. Constructive Issues and Concepts in Joint Logistics Transformation

2.1 Lessons from OIF: Scalability Issues in Logistics Transformation

OIF was a testbed for rapid innovation in logistics transformation, and a useful stress test for the scalability of systems and processes. Several speakers noted the rapid learning and joint logistics initiatives at the tactical level that developed in OIF 2, after many systems had been challenged in OIF 1. Logistics support during OIF used processes and systems in ways that were neither intended nor anticipated.⁷

2.1.1 OIF and Logistics Innovation: Lieutenant Colonel **Burke** suggested that “New logistics systems can be implemented more rapidly outside the typical force management process (Joint Capabilities Integration and Development System), as shown by systems rapidly implemented in OIF. In OIF, staff could more easily use spiral development methodology rather than a more traditional, slow and formal waterfall methodology.” Vice Admiral **Lippert** also noted the improvement in asset visibility early in OIF. “Likewise, we had the ability before combat operations in OIF to see that the level of readiness across the DoD was all green....”

2.1.2 OIF and Scalability of Logistics Systems Under War Tempo: OIF definitely presented a stress test for legacy logistics systems. Vice Admiral **Lippert** stated that “the quantity of requirements for OIF was unexpected in spite of efforts to build up the industrial base, resulting in a temporary lower fill rate and back orders.” Colonel **Ruark** emphasized that “One of the major distribution problems in OIF 1 was that the Army was not resourced properly in terms of equipment, people, systems and processes to support theater distribution. The real takeaway is that the Army was unprepared to handle the full scope of theater distribution they were supposed to handle, and it came down to the Marines to support themselves thru contracted commercial transportation, e.g. workarounds such as local trucking companies in Kuwait and Iraq, assets in the absence of that support until the Army was finally prepared to take on this responsibility (well after hostilities were underway). Pallets needed to be constantly reloaded without a ‘destination’ approach.”

2.1.3 OIF and Finance: Budgeting and financing flexibility, and the acquisition process in general, was a source of problems. Lieutenant Colonel **Burke** said that “Financial regulations and lack of flexibility in IT spending were a major constraint in rapid, agile fielding of logistics systems. Their experience pre and post-OIF was that discretionary dollars were not available for rapid fielding of logistics IT systems, and the normal acquisition process is slow, so the only option was to kill other programs to obtain the necessary budget. During OIF, funding flowed into CFLCC for logistics systems, but under great pressure to obligate that funding very quickly.”

2.1.4 OIF and Asset Visibility: OIF was an important exercise in the current limits of using RFID. Vice Admiral **Lippert** observed that “Active RFID was placed on everything that left the depots at the container level, but asset visibility is still not solved at a pallet level, or at the last tactical mile. In OIF, initial problems with too few readers and untrained users were mostly resolved.” Future actions may encounter similar

problems, according to Colonel **Ruark**, who noted that “although active RFID devices were successful during the second phase of OIF, in a mature theater, the materiel will likely always get out ahead of the RFID readers in any new warfare environment. In a new, immature theater, planners can expect a repeat of the difficulties with initial phase of OIF's lack of infrastructure, until hardware and software is in place for tracking RFID.”

2.1.5 OIF and Institutionalization of Lessons Learned: The biggest constraint in applying the OIF experience will be organizational resistance to change, according to Lieutenant General **Cuviello**, who cautioned that “wars are only good to effect change at the tactical level. After the action, culture remains an inhibitor and the Services no longer practice the unity of the battlefield, rather they go back to training the old way on the old system – not the way they fought. The tactical lessons learned are not being brought back and integrated into the strategic logistics network.”

2.2 Interoperability and Data Integration – Challenges and Cases

Data integration is central to interoperability. All participants had interest in and experience with data integration issues, a fairly new phenomenon according to Mr. **Erb**. Some participants, particularly from the Air Force and Marines, suggested that the most robust data model used selective, not comprehensive, data feeds. Mr. **Aimone** stated that “The interoperability should exist at the field level of the system to obtain the necessary data fields for transaction level processes. Coordinate with the ECSS system and the other Service systems along with allowing updates and changes. This would allow the Air Force to take and read the necessary fields from AKO and put it on the Air Force computer screen, vice-versa. A logical data model for joint logistics interoperability will define solid interface control points, with clear data feeds for a simple set of inputs and outputs, for example, between the Air Force and Army logistics systems.”

2.2.1 Success Story in Data Interoperability: One of the most-cited cases of data integration was described in detail by Lieutenant Colonel **Burke**, and he too mentions that selectivity in data feeds helped achieve success. “The logistician needs business intelligence to achieve the next component of visibility that is ‘Who sent me the stuff,’ and ‘Where is stuff that is beyond the reach of RFID interrogators.’ They used the Joint Deployment Logistics Model from U.S. Army Europe, a simulation model, as the engine to analyze real-world data feeds from many distributed and different databases (originally about 15). The resulting system was the Battle Command Sustainment Support System, now JROC approved. The BCS3 was a learning adaptive model because algorithms could be continuously improved to more precisely reflect real world situations, as real data was used to test assumptions. One requirement for success of this system was that they fed it only selected data, not everything. With XML and OLAP architectures, the BCS3 could be protocol agnostic.”

2.2.2 Problem Cases: Data interoperability can be difficult to build even within a single vendor's multiple contract vehicles and versions. Lieutenant General **Christianson** stated that “We do not have common standards that enable Oracle and SAP objects to be interoperable. Interoperability can even be difficult between different systems from the same vendor. An additional problem is created by lack of data

ownership in ERP systems that were initially purchased as hosted services, but now must be integrated with Army owned and operated databases and ERP systems.“ Lieutenant General **Cuviello** noted comparable problems in other branches of the services: “The Navy’s logistics transformation is a prime example because they now have to integrate 3 major SAP programs that are not very interoperable. Another example is the Marine Corps Oracle ERP solution, which lack complete requirements for inter-connection to external ERP systems.”

2.2.3 Common Data Architecture and Data Model: Several experts expressed a need for a common data architecture and common data model. Lieutenant General **Christianson** stated that “Services and Joint Logistics Agencies need to use a common data architecture, defined by OSD. They need to share a Common Logistics Operating Environment. More highly selective joint experiments need to be conducted to see what data can be moved off a platform using this common data architecture. Interface requirements between systems can place the common data translation requirement on either side of the interface.” General **Kern** had a similar view with a focus on the customer: “We need interchangeable information systems, between Oracle, SAP and similar vendors. We need data standards to allow them to exchange information. They should accept the common issued standards. The way you display information can adapt to different users, but we need a common understanding of the underlying data.”

Mr. **Erb** reported that “J4 is now starting work on a joint logistics data model, including naming conventions and business process definitions. This effort has just started in the last quarter. As an initial step, the team has gone back into the Defense Data Dictionary to determine the previous ‘owners’ of specific data elements. The overall task requires identifying who is responsible for each element in the Data Dictionary, literally thousands of elements and attributes, and moving these over to a metadata repository. Each Agency and Service is using XML, but without a common metadata repository, they do not have a common map.” In the last month (roughly March 2005), **Erb** noted, the data leads started a project, working with DISA, to identify leads for data required by Combatant Command Combat Service Support staffs in an inventory of all communities of interest throughout DoD.

2.2.4 Data across Domains: **Erb** also spoke about the cross-domain data required to support logistics. “Logistics for combat support requires joint access to data that includes both logistics data, and command and control data. In fact, only about 55% of the data needed will come from the logistics communities of interest. For example, weather is crucial to combat support and logistics management, but CSS elements do not own the weather process and data – the DoD has about 50 iterations of weather data, most of which is replicated and latent.”

2.2.5 Integrated Data Environments: Every operation requires unique data feeds across joint systems. The architecture and data repository being created has to support flexibility for unexpected situations. J4 is encouraging several data interoperability efforts. Mr. **Erb** noted that all Services have to provide an integrated data environment (IDE), based on a key document, the GCSS capstone document. The first phase of integration may focus on internal systems, but the IDE architecture is supposed to have external interfaces to the Joint Agencies and other Services. JROC mandated language in

the capstone document requires data sharing and timeliness of data made available. **Erb** suggested an enterprise-wide IDE. “One possible approach is to hook up the twelve Service and Joint IDE's into a Logistics Enterprise IDE, possibly under the process ownership of DLA. This builds on the capstone document's mandate to the Services to identify authoritative data sources for their local IDE's. All PM's should be at some development stage in creating their IDE; some may call it their data warehouse within a particular software application or ERP application, but the requirements are the same.”

2.2.6 Negotiating Data Touchpoints: **Erb** added that “From 2001 to 2004, logistics initiative PMO's met semi-annually to share program information. However, moving beyond PowerPoints to actual implementation of interoperability could not occur at that organizational level. Therefore, J4 has started to hold recurring meetings with program system architects, and a second track of monthly meetings with data architects and data managers. Their discussions focus on potential touchpoints between logistics systems. For example, some specific touchpoints can be readily identified between GCSS-A and the Defense Integrated Military Human Resources System (DIMHRS).”

2.2.7 The Problem of Integration with Financial Data Systems: As a general principle, Vice Admiral **Holder** suggested that logistics and financial transformation needed to be developed together: “Internal accounting is not clearly defined across Services – for example, there is no common definition for a munitions account. Therefore, materiel is transferred but often untraceable.... Logistics transformation needs to be coordinated with a transformation of the financial systems, with strong horizontal connectivity. RFID and transformed financial systems are strong drivers for horizontal integration.” But Lieutenant Colonel **Burke** raised the contradictions between legacy logistics and financial domains. “A large part of the Air Force logistics legacy environment is focused on financial management, especially on the supply side. I think the Air Force maintains way too much financial capability in the logistics environment. Logistics and finance have competing priorities, contradictory requirements and communities who need to communicate better. They need to be separated at the process definition and system levels. However, the challenge moving forward in all these modernization efforts is that we end up repeating a lot of that past functionality, even when it's not the best process.”

Major General **McManus** spoke to the ways existing financial management systems can limit logistics transformation. “Financial problems are a show-stopper. Financial systems are real stovepipes with more points of friction than are manageable. In OIF, financial systems were independent and created difficulties in generating data needed to get funds to pay people. Financial processes are now a constraint limiting supply chain management transformation. If you walk into an ammo yard, whoever paid for the ammunition claims ownership.”

General **Kern** suggested that from the war fighter's point of view, problems with financial management are not as important. “In order processing, the real missing bridge is the level where the part is ordered – to be able to see where it is, that the order took, and that it is shipped and when you'll get it. Visibility into the financial or transaction processing function is a second priority.”

2.3 Decentralized, Less Joint, Locally Focused Business processes, Programs and Transformation Strategies

One cluster of expert opinion centered around a decentralized, selective approach to interoperability for joint logistics. The systems theory support for this approach is summarized above in “Technical Note: An Alternative Approach to Managing Complex System of Systems.” Experts from the Air Force and the Marines recommended this approach, in part because of the unique requirements of those Services.

Mr. **Aimone** states: “There is no need for a high-level jointly defined process or definitions because any agreement would only occur at the lowest common denominator and hence be useless. Operations are defined at three levels, those that are Service central, those that are Service supported and those that are purely Joint. Processes may also change rapidly and any system must be able to add or delete process definitions and data feeds. Joint is not a value in and of itself, rather only the times when it is necessary and can increase efficiency and effectiveness. Air Force is Joint when there is value to it. The transformation process needs to recognize that the Air Force operates differently than others.”

The Marines were very positive about the selective interoperability they had achieved with the Army, but also emphasized that it was a temporary arrangement. Colonel **Ruark**'s team asserted that “The Marines are leveraging current Army logistics systems and long-range communications in the Iraq theater of operations to obtain better visibility of its logistics and gain real time situation awareness. The Corps has even developed interfaces between its legacy supply and readiness systems and the Army’s to enable cross-Service visibility. These improvements in interoperability are essential to guiding the Corps’ path to the future as it develops the Global Combat Support System – Marine Corps and fields expeditionary communications capabilities... As long as they're in CENTCOM, the Marines are using Army systems and communications systems as ‘bridge solutions’ until they field GCSS-MC.” Similarly, Lieutenant Colonel **Burke** (mentioned the effectiveness of “light” integration with the Marines in at least one case: “[In OIF] Highly integrated applications were not necessary for efficient and effective coordination between units and Services. For example, the 2nd MEF and the Army used online chat to find spare parts, even though their applications could not exchange data. Today, USMC and Army supply systems in OIF can exchange data and search for parts automatically.”

Major General **McManus** observed that selective interoperability and joint efforts do occur at the tactical level. “Jointness in logistics is about the coalition of the willing, and some are more willing to be joint than others. The battlespace encourages jointness at the tactical level. The biggest cultural problem is Services who say “I’m joint enough as it is.” In discussions concerning how to rethink theater support, there has not been total agreement between the Air Force and the Army as to the nature of the problem or the need for jointness.” He added, “We need new leadership to rethink jointness. New process initiatives coming from DoD are important to generate change management. With those Services who are less committed to jointness, we need to strategically and surgically identify those events that can have the biggest joint impact.”

A question raised but not resolved by participants was the affect of decentralized, selective jointness on the Service concepts of modularity, agility and a lighter logistics footprint. Which creates more modularity, agility, and lightness: the ad-hoc selective approach to interoperability, or the more centralized approach, or a hybrid?

2.4 Centralized, More Joint, DoD Focused Business Processes, Mapping, Metadata and Transformation Strategies

Several experts made a strong case that a single, comprehensive map of the logistics enterprise is needed. Lieutenant General **Christianson** stated that “Without a common view of business processes, logistics organizations will continue to compete or bump into each other as they work hard to execute their missions...The logistics business process must be defined from end-to-end at the DoD level, and then Services and Agencies must align with those processes. It’s the process, not the system that is critical. The Army and Navy, for example, could use a different infrastructure but can still map to common processes.” Lieutenant General **Cuviello** and Vice Admiral **Holder**’s comments were similar, with the latter stating that “An overview or big map of all logistics initiatives would help to let people see where we’re going to go.” Lieutenant General **Christianson** emphasized that process owners must be identified to determine accountability. “Process owners must be at the top of the organization, similar to the model employed at Dupont. Current Army process owners are at too low a level, which may be OK as an interim step toward initial SALE implementation. But to develop integrated, effective policies and programs, low-level process ownership will not work. The process owner hierarchy would become a network of ‘owners’ throughout the organizations that play a role in process execution.”

Lieutenant Colonel **Burke** suggested that as a model, the British organizational structure for logistics is useful. “They have a nationally defined architecture, unified Joint leadership, and each Service is required to adhere to National standards, with unique architectures at lower levels as needed. This structure can be used to plan how different Service-level ERP systems, such as Oracle and SAP, could be coordinated through a national architecture.” He also observed that TRANSCOM and DLA are currently creating ‘as-is’ process maps, but “the task is both difficult and perhaps not effective because the business domain and systems are so dynamic. What is needed is an agreed-upon ‘to-be’ process map.”

3. Operational Issues and Concepts in Joint Logistics Transformation

3.1 The Customer/Warfighter View of Logistics Transformation – Demand Forecasting, Information Assurance

Participants discussed the increased focus on the customer experience at the end of the supply chain. Major General **McManus** emphasized that the warfighter needs assured information more than predictability. “Without assured information for the warfighter, he will multiple order everything to make sure that something he needs gets there in a timely manner. We have to move beyond just demand forecasting, to obtaining as much advance planning information as technology can provide. For example, TRANSCOM will see materiel when it’s offered for transport, but if everything has to go by air, TRANSCOM only has a fixed number of platforms. Typically everything is Priority 1. The supporting Combatant Commander has to make priorities on his own, but if he can see the information far enough in advance, he can devise a better way to get the materiel to the theater, and to optimize his fleet. This provides better fidelity to the customer as to when the goods will actually arrive.”

3.2 Training, Lost Learning and Succession Planning: Personnel

Several experts noted the expanded opportunities at all stages in a career to participate in joint activities. Mr. **Bennett** noted that “The Joint Logistics Commands will be the model for the future. We’re starting to build common experiences in Joint Commands at all stages in a career, not just at the final stage for a select few individuals. The thirteen Marines in the Army FCS program are crucial for bringing the Marine point of view into the equation. At the Army CALL, and in other HQ they now have slots for every Service member. Where you have to produce, the staff guy working as a planner next to you could be from any Service.”

Several participants were concerned about the sustainability of transformation. Lieutenant General **Dail** noted the risks of losing organizational leadership for logistics transformation. “TRANSCOM as the Distribution Process Owner needs to be codified into some form of charter, statutory legislation to avoid the discrepancies occurring when the inevitable rotation of senior civilian leadership occurs. The details of responsibilities are still evolving and being defined using the initial memorandum by the Secretary of Defense as the foundation.” Lieutenant General **Cuviello** is concerned that “the bureaucracy will wait until the individuals who are pushing change leave, and then logistics transformation efforts, including any joint efforts, could slow down. More than the distribution and transportation process ownership by TRANSCOM is required – other logistics processes need high-level control as well.”

3.3 Change Management

Cultural barriers can be complex, combining organizational behavior, policies, and technical barriers. Many cultural barriers provide measurable local benefits, even if they are sub-optimal from the perspective of the larger organization. Several examples of cultural barriers to logistics interoperability and jointness were mentioned by participants,

such as this from Lieutenant Colonel **Burke**: “In some situations, a Service with a unique culture may be reluctant to open their data environment to outside data feeds and systems. For example, throughout OIF 1, the Air Force would not provide near real-time information on cargo being airlifted, so the Army was unable to ensure that the right trucks were in place to transport the cargo off-airfield. The Army was given access to batched information several hours too late. In another example, Army-certified systems could not be put on Air Force networks, or were periodically removed from those networks, due to different security standards on data port access and vulnerabilities...A joint business network can solve this problem.”

Some experts were optimistic that cultural change would evolve from the increased variety of tactical joint experiences – a bottom-up evolution. Mr. **Bennett** stated that “We have good examples today for the cultural change that will be widespread in the future. The push for change is coming from the bottom, as well as from the top. The Special Operations community is a great example of elimination of cultural identities, regardless of the Service they belong to, both at a tactical and at a higher HQ level. All the Services now view Special Operations community as a separate group, because they have developed a cultural identity that is unique compared to the Services backgrounds of their individual members.”

Other experts felt that change management required strong strategic authority, from the top-down, and involving both DoD and Industry leadership. Lieutenant General **Cuviello** recommended that “Any solution needs to place all Service ‘4s,’ relevant Agencies and commands, and industry together in the same room. Industry is critical for the knowledge and ability to state the feasibility of potential solutions that the DoD lacks. It would be a 3-Star/VP Task Force that could define the way ahead with an agreed upon architecture, portfolio management, ERP, etc. We need a clear process-driven plan that works out exactly what needs to be implemented, with the authority to act.” General **Kern** recommended a similar task force: “Logistics transformation will happen when CEOs all meet to address and enforce change in standards and alignment. Key participants should be the OSD and the CEOs of SAP, Oracle, FEDEX, DHL, etc.”

Organizational change often requires the elimination of legacy organizations, not just legacy systems, through business process reengineering. All participants noted the great difficulty currently in eliminating legacy bureaucracies within their own Services, as well as the cost and effort required for ongoing business process reengineering (BPR). These BPR efforts can absorb all available resources, with no resources left over for any joint or external interoperability analysis. Mr. **Dittmer** observed, “We are still finding the right balance between Business Process Reengineering and implementation. The Services do not want to pay the costs of maintaining legacy systems. But when they try to move beyond legacy systems, they find it difficult to do proper BPR and governance, due to limitations in expertise, cultural barriers or patience...Most organizations cannot afford to do two to three years of BPR, with minor pilot implementations. What is key is being able to slice off mature pieces of the enterprise, where you are confident you’ve got a solid operational model, and implement those areas modularly.”

Each of the Services and Joint Agencies had dedicated additional resources for change management, often in the form of education and training for new business processes and

systems. However, these resources were not specifically tasked to work on change management for interoperability or jointness; their focus was change management within the Service or Agency organization. For example, Colonel **Ruark**'s team stated that the Marines “have invested in field level resources at the Marine Expeditionary Forces that have added 60 specially screened logistics Marines at the tactical level in support of this effort. Change Management is occurring often behind the scenes. The Marines have invested resources, notably a squad sized Transition Task Force that will help institutionalize the Logistics Modernization initiatives.” Logistics personnel are working in joint teams or detailed to another Service’s team, and they are developing shared scenarios and requirements for logistics interoperability from these experiences. However, these assignments are often ad-hoc, the experiences may educate only the individuals involved, and no lasting organizational change may result.

Conclusions and Recommendations

Programmatic

- Existing funding mechanisms act as disincentives for joint logistics transformation and interoperability. If interoperability is important to transformation, OSD must fund it adequately and specifically, not just the component systems and organizations being integrated. Services and Agencies will be reluctant to act against their own financial interest.
- Title 10 can be used to prevent joint logistics transformation and interoperability, and needs clarification. If a Logistics Command is created, Title 10 may need to be amended.
- Expanded OSD leadership (beyond technical standardization) for joint logistics transformation is necessary to effect change. The Logistics Systems Modernization office efforts to realign business processes and to prioritize rapid ROI initiatives are a good start and can be expanded.
- A 4-Star Combatant Command – USLOGCOM – in charge of logistics needs to be created, following the example of STRATCOM. The responsibilities and enforcement powers of this Logistics Command may be significantly different than the STRATCOM model and require clear specification. Some responsibilities that this Command could undertake include:
 - Defining the distribution authorities, scenarios, business processes and process ownership at the ‘hand-off’ from TRANSCOM distribution to Services distribution
 - Developing doctrine and implementing joint business processes and rules for logistics interoperability between Services, prioritizing known problem and conflict areas, and assigning ownership of business processes across the broader (SCOR-defined) supply chain
 - Identifying budget requirements for logistics interoperability, and requiring logistics interoperability to be adequately funded and planned as part of the acquisition process of any logistics systems
 - Accelerating interoperability testing of all GCSS implementations both within and across Services and Agencies, with a spiral development methodology
 - Coordinating and communicating various isolated ongoing efforts in defining logistics XML schema, business processes, databases, published Web services and other joint logistics projects, with the IDE and ERP programs underway in the Services and Agencies. Where conflicts, redundancies or gaps are identified, the USLOGCOM may function as an ‘honest broker’ to develop an interoperable solution, or as a ‘sheriff’ to enforce an interoperable solution.

Constructive

- A single logistics business process modeling needs to be created as a common reference, with the understanding that the modeling effort will be descriptive rather than prescriptive, due to Services' autonomy and the need to continue migrating legacy systems and building new logistics capability. Since all Services, Agencies and OSD are employing the SCOR model for logistics, some degree of commonality should already exist. If the process modeling effort can build on existing TRANSCOM/DLA business process models, and incorporate business process models from each of the Services, it may be available earlier and used more effectively. A 'greenfield' effort may have limited utility and never get beyond the requirements stage. Efforts to align logistics data are underway within J4, and in the ongoing TRANSCOM/DLA modeling. The touchpoints between these alignment efforts and the actual ERP implementations within the Services and Joint Agencies could be expanded. A variety of 'to-be' logistics business process models must be generated to meet the requirements of varying future war fighting scenarios. For example, loss of space assets or enemy use of electromagnetic pulse will create significant constraints on logistics interoperability, and contingency business processes should be designed for those scenarios.
- The logistics business process must be defined from end-to-end at the DoD level, and then Services and Agencies must assess how they will or will not align with those processes. Alignment, interoperability and jointness are consensus goals for system development, but some Service decisions not to align with specific DoD level processes may provide net benefits and increase the robustness of the overall logistics System of Systems (the federated supply chain, or loosely-coupled approach). The ongoing questions that the USLOGCOM will address are these: Should the default state for interoperability be alignment, with non-alignment developed as a scenario-based exception? Or should the default state for interoperability be non-alignment, with occasional moments of alignment (specific data feeds of a finite duration)?

Operational

- Some form of charter or statutory legislation is needed to prevent joint logistics transformation from backsliding into non-interoperable organizations and systems, when leadership changes.
- Change management for joint logistics needs to be resourced specifically, in addition to current resources for logistics transformation within services and joint agencies.

Appendix 1: Individual Contributor Comments

All biographical information is accurate up to the date of the contributor's interview as listed, as noted.

1. Mr. Michael Aimone is the U.S. Air Force Assistant Deputy Chief of Staff for Installations & Logistics.
2. Mr. Pat Bennett is the Director for Logistics, Requirements & Readiness Systems for FCS at The Boeing Company. He was previously Chief, Program Development Division, Program Analysis and Evaluation Directorate, OCSA.
3. Lieutenant Colonel Forrest Burke is Chief, Logistics Network Task Force, US Army G-4.
4. Lieutenant General Claude V. Christianson is the U.S. Army Deputy Chief of Staff for Logistics (G-4). Previously he served as the Assistant Deputy Chief of Staff for Logistics.
5. Lieutenant General Peter CuvIELLO (Ret.) is Vice President and Managing Director of the Focused Logistics Enterprise at Lockheed Martin. Previously he served as the Department of the Army Staff Chief Information Officer (G-6).
6. Lieutenant General Robert Dail is Deputy Commander, U.S. Transportation Command (TRANSCOM) and previously he was the TRANSCOM Director of Operations.
7. Mr. Jon Dittmer is a Program Manager for Oracle Defense Operations. Previously he was a U.S. Air Force Lieutenant Colonel and Chief of the Air Force's Supply Systems Division in Montgomery, AL.
8. Captain Bernard Dunn is the Branch Head for the Navy's Logistics Operations Programs & Policy Division. Commander Steve MacDonald manages Supply Operations and Policy.
9. Mr. John "Jay" Erb is the Deputy Director for Strategic Logistics, The Joint Staff. Previously he was the Deputy for Logistics Readiness at the Joint Staff.
10. Vice Admiral Gordon Holder (Ret.) is a Principal with Booz Allen Hamilton. Previously he was the Joint Staff Director for Logistics (J-4).
11. General Paul Kern (Ret.) is a Senior Counselor with The Cohen Group. Previously he served as the Commanding General of the Army Material Command.

12. Vice Admiral Keith Lippert is the Director of the Defense Logistics Agency. Previously he served as Commander of Naval Supply Systems Command and 41st Chief of the Supply Corps.
13. Major General Wade McManus (Ret.) is the Vice President for Strategic Logistics at Northrop Grumman Mission Systems. Previously he served as the Commanding General of the U.S. Army Operations Support Command at Rock Island Arsenal.
14. Mr. John Nyere is responsible for multiple tasks associated with the realization of the Future Logistics Enterprise (FLE) for the OSD Assistant Deputy Under Secretary of Defense for Logistics Systems Modernization (LSM). He was recently elected to the Supply-Chain Council's Technical Development Steering Committee.
15. Colonel Robert Ruark is the Head of the United States Marines Corps Logistics Enterprise Integration Center. Lieutenant Colonel James Turlip is the Deputy for the Logistics Enterprise Integration Center, United States Marine Corps. Mr. Gavin McCarthy is the Logistics Architecture Consultant to the Marines Corps Modernization Initiatives.

**1. Mr. Mike Aimone
(3-29-2005)**

Mr. Michael Aimone is the U.S. Air Force Assistant Deputy Chief of Staff for Installations & Logistics.

“As-Is” Issues in Logistics Transformation

- The Air Force is using Lean as a methodology, and SCOR as the domain model for its transformation. The Air Force treats transformation as a continuous process. The Air Force has started by defining its architecture, rather than implementing an out-of-the-box solution. The Air Force hopes to have an ERP solution chosen by June. This is to implement the two-fold vision of increasing aircraft availability by 20 percent and cutting the cost by 10 percent by 2011.
- Title 10 defines clear responsibilities for the individual Services to handle logistics, which is one of the inhibitors to a completely integrated and joint logistics system. Joint interoperability should exist for common items, for example, the Air Force and Navy use the same landing gear, and all helicopter maintenance is done at Army Depots.
- The Joint Logistics Board and Joint Logistics Commanders Board, are the appropriate level for defining transformation processes and interoperability standards. TRANSCOM’s DDOC is an ad hoc process and not significantly different from the Joint Movement Center, both of which are still lacking an adequate Command & Control System.
- There is no need for a high-level jointly defined process or definitions because any agreement would only occur at the lowest common denominator and hence be useless. Operations are defined at three levels, those that are Service central, those that are Service supported and those that are purely Joint. Processes may also change rapidly and any system must be able to add or delete process definitions and data feeds.
- Joint is not a value in and of itself, rather only the times when it is necessary and can increase efficiency and effectiveness. Air Force is Joint when there is value to it. The transformation process needs to recognize that the Air Force operates differently than others. There is an Air Officer stationed as a Liaison Officer in Multinational Force (Iraq) with General Casey.
- The Air Force is continuing Depot Level changes implementing Lean and SCOR processes. This as allowed maintenance for the KC 135 to have a turn around time of approximately 220 days unlike the 320 plus days of before. An example of the changes was to also decrease the amount of towing per aircraft from 18 miles to 3-4 miles at the depots.

“To-Be” Concepts in Logistics Transformation

- There needs to be an adequate Command & Control System implemented, especially at the tactical level, where the war fighter can communicate and translate requests for items – a web-based UPS style system, with visibility into other services' systems even without full integration between systems. The need

is for the right C2 system to see Army and Air Force assets and to translate soldiers' needs through the order and transaction processes. The Air Force needs interface control for flexible data feeds to provide the Army with selective Air Force data access.

- The interoperability should exist at the field level of the system to obtain the necessary data fields for transaction level processes. Coordinate with the ECSS system and the other Service systems along with allowing updates and changes. This would allow the Air Force to take and read the necessary fields from AKO and put it on the Air Force computer screen, vice-versa. A logical data model for joint logistics interoperability will define solid interface control points, with clear data feeds for a simple set of inputs and outputs, for example, between the Air Force and Army logistics systems.

2. Pat Bennett (3-30-2005)

Mr. Pat Bennett is the Director for Logistics, Requirements & Readiness Systems for FCS at The Boeing Company. He was previously Chief, Program Development Division, Program Analysis and Evaluation Directorate, OCSA

“As-Is” Issues in Logistics Transformation

- A historical perspective is important to understand how far logistics has already been transformed. Oversight of compliance with joint requirements is far more extensive than 10 years ago. DoD has adjusted to more robust requirements for jointness in logistics management. Many barriers to logistics alignment have been due to cultural barriers within the services: biases, prejudices, a lack of information about each other's processes. Now that the DoD has required everyone to be in sync with the Joint Technical Architecture, eventually all logistics initiatives will have to link in and support the overall DoD architectural requirements.
- With TRANSCOM as distribution process owner, working with DLA, clear responsibilities and ownership are now defined that were unclear before. For example, a clear process is now defined for the care and feeding of 360L pallets. They're also providing a model organizational process for seeking out specific innovations from industry and integrating those into the TRANSCOM initiatives. TRANSCOM works directly for the SECDEF, not for the joint chiefs. Their autonomy and authority were proven in OIF. After OIF lessons, the guidance is that if you're not joint you're not a player. Stovepipe solutions are to be avoided. TRANSCOM and DLA are the two biggest elephants in the room; if they're doing it one way, the rest of us are going to be following their path, because we're dependent on them.

“To-Be” Concepts for Logistics Transformation

- We have good examples today for the cultural change that will be widespread in the future. The push for change is coming from the bottom, as well as from the top. The Special Operations community is a great example of elimination of cultural identities, regardless of the service they belong to, both at a tactical and at a higher HQ level. All the services now view Special Operations community as a separate group, because they have developed a cultural identity that is unique compared to the services backgrounds of their individual members. When our war fighting needs define this kind of cross-cutting community, where members from different services working on a common process or operation have to rely on and understand each other, we see the real cultural change happening. As you move away from the point of the spear, we see the old cultural barriers return, because the back office functions of the different services may not share that clearly defined joint operation or process.
- The Joint Logistics Commands will be the model for the future. We're starting to build common experiences in joint commands at all stages in a career, not just at the final stage for a select few individuals. The thirteen Marines in the Army FCS program are crucial for bringing the Marine point of view into the equation. At the Army CALL, and in other HQ they now have slots for every service member. Where you have to produce, the staff guy working as a planner next to you could be from any service.

3. Lt. Col. Forrest Burke (3-31-2005)

Lieutenant Colonel Forrest Burke is Chief, Logistics Network Task Force, US Army G-4.

“As-Is” Issues in Logistics Transformation

- **Budgetary Agility:** New logistics systems can be implemented more rapidly outside the typical force management process (Joint Capabilities Integration and Development System), as shown by systems rapidly implemented in OIF. In OIF, staff could more easily use spiral development methodology rather than a more traditional, slow and formal waterfall methodology. Financial regulations and lack of flexibility in IT spending were a major constraint in rapid, agile fielding of logistics systems. Their experience pre & post-OIF was that discretionary dollars were not available for rapid fielding of logistics IT systems, and the normal acquisition process is slow, so the only option was to kill other programs to obtain the necessary budget. During OIF, funding flowed into CFLCC for logistics systems, but under great pressure to obligate that funding very quickly.
- **Three Critical Gaps in Logistics Management:** In OIF, they identified three critical gaps that they could fix at least in part. These gaps were 1) the need for a business communications network and 2) the need to know where materiel was located, and 3) who had sent the materiel, and where its final destination was.

- **Gap #1:** To resolve the first gap, the CSS VSAT communications network was built from COTS with a single security classification, rather than traditional milspec, as a joint business network. By OIF 3, the Marines were participating, but their signal leadership wanted business communications run through the battle command network, rather than through a common joint process-oriented business network.
- **Gap #2:** To resolve the second gap, the logistician has to answer the question, what does the killer need to know and need to have. The logistician needs to look at the killer's decision cycle to determine when we need to tell him where his stuff is. Active RFID was the OIF solution. RFID was the fundamental underpinning of business intelligence at the pallet level in OIF.
- **Gap #3:** To resolve the third gap, the logistician needs business intelligence to achieve the next component of visibility that is "Who sent me the stuff," and "Where is stuff that is beyond the reach of RFID interrogators." They used the Joint Deployment Logistics Model from U.S. Army Europe, a simulation model, as the engine to analyze real-world data feeds from many distributed and different databases. The resulting system was the Battle Command Sustainment Support System, now JROC approved. The BCS3 was a learning adaptive model because algorithms could be continuously improved to more precisely reflect real world situations, as real data was used to test assumptions. One requirement for success of this system was that they fed it only selected data, not everything. With XML and OLAP architectures, the BCS3 could be protocol agnostic.
- **Cultural and Technical Barriers:** In some situations, a Service with a unique culture may be reluctant to open their data environment to outside data feeds and systems. For example, throughout OIF 1, the Air Force would not provide near real-time information on cargo being airlifted, so the Army was unable to ensure that the right trucks were in place to transport the cargo off-airfield. The Army was given access to batched information several hours too late. In another example, Army-certified systems could not be put on Air Force networks, or were periodically removed from those networks, due to different security standards on data port access and vulnerabilities. These cultural and technical barriers will need to be resolved before more specific logistics alignment can occur between the services. A joint business network can solve this problem.
- No programmatic incentives are in place to push service organizations to align along shared domains and processes. That's not how we resource programs or departments.

"To-Be" Concepts for Logistics Transformation

- Highly integrated applications were not necessary for efficient and effective coordination between units and services. For example, the 2nd MEF and the Army used online chat to find spare parts, even though their applications could not exchange data. Today, USMC and Army supply systems in OIF can exchange data and search for parts automatically.

- All Services need to be on a joint business network to ensure timeliness and transparency of business information.
- As a model, the British organizational structure for logistics is useful. They have a nationally defined architecture, unified Joint leadership, and each Service is required to adhere to National standards, with unique architectures at lower levels as needed. This structure can be used to plan how different service-level ERP systems, such as Oracle and SAP, could be coordinated through a national architecture.
- TRANSCOM and DLA are currently creating “as-is” process maps, but the task is both difficult and perhaps not effective because the business domain and systems are so dynamic. What is needed is an agreed-upon “to-be” process map.
- A single ERP software solution should be used at the national level (TRANSCOM, DLA, etc), even if different ERP systems are used at the Services level. SAP and Oracle can be used together to the extent that they have already mapped common objects and processes.
- A 4 star Combatant Commander for logistics is required, equivalent in the chain-of-command to STRATCOM, to harmonize logistics management at the national level.

4. Lieutenant General Claude V. Christianson (3-25-2005)

Lieutenant General Claude V. Christianson is the U.S. Army Deputy Chief of Staff for Logistics (G-4). Previously he served as the Assistant Deputy Chief of Staff for Logistics.

“As-Is” Issues in Logistics Transformation

- We have not yet defined the business processes that support supply chain management. We need to lay out and synchronize the supply process, but we will get different definitions from the services unless we create a common definition and gain agreement. For example, GCSS never had an end- to-end process analysis that applies to all Services.
- Without a common view of business processes, logistics organizations will continue to compete or bump into each other as they work hard to execute their missions.
- In OIF, the Army integrated databases from fifteen systems and was able to display that data through a single portal, showing cargo on ships as well as Army supply activities on a single screen. This capability led to what is today the Battle Command Sustainment System (BCS3), which is also being used by the Marines in theater today.
- We do not have common standards that enable Oracle and SAP objects to be interoperable. Interoperability can even be difficult between different systems from the same vendor. An additional problem is created by lack of data ownership in ERP systems that were initially purchased as hosted services, but

now must be integrated with Army owned and operated databases and ERP systems.

“To-Be” Concepts for Logistics Transformation

- The logistics business process must be defined from end-to-end at the DoD level, and then Services and Agencies must align with those processes. It’s the process, not the system that is critical. The Army and Navy, for example, could use a different infrastructure but can still map to common processes.
- If organizations are duplicative or do not add value to joint logistics processes, they need to be truncated.
- Services and joint logistics agencies need to use a common data architecture, defined by OSD. They need to share a Common Logistics Operating Environment. More highly selective joint experiments need to be conducted to see what data can be moved off a platform using this common data architecture. Interface requirements between systems can place the common data translation requirement on either side of the interface.
- Process owners must be at the top of the organization, similar to the model employed at Dupont. Current Army process owners are at too low a level, which may be OK as an interim step toward initial SALE implementation. But to develop integrated, effective policies and programs, low-level process ownership will not work. The process owner hierarchy would become a network of “owners” throughout the organizations that play a role in process execution

5. Lieutenant General Peter CuvIELLO (Retired) (3-28-2005)

Lieutenant General Peter CuvIELLO (Ret.) is Vice President and Managing Director of the Focused Logistics Enterprise at Lockheed Martin. Previously he served as the Department of the Army Staff Chief Information Officer (G-6).

“As-Is” Issues in Logistics Transformation

- The status quo transformation process lacks adequate oversight and control, from either the Joint Staff or the OSD, resulting in little substantial coordination and more stove pipes and no enterprise solution. The NII is not adequate; it is only effective around policy and process. The Navy’s logistics transformation is a prime example because they now have to integrate 3 major SAP programs that are not very interoperable. Another example is the Marine Corps Oracle ERP solution, which lack complete requirements for inter-connection to external ERP systems.
- Any solution will take time and need somebody to constantly push to resolution, which is lacking now, e.g. there is nobody to say “no” to a new system, architecture, etc. The need is to ensure that all these systems add value, not necessarily to take anything away from the Services. The bureaucracy will wait

- until the individuals who are pushing change leave, and then logistics transformation efforts, including any joint efforts, could slow down. More than the distribution and transportation process ownership by TRANSCOM is required - other logistics processes need high-level control as well.
- Present day industry contracts take advantage of the lack of coordination, all funding legacies without a point of convergence. For example, GCSS is a system of legacy systems without adequate horizontal integration. PPBS itself supports a stovepipe approach to system sustainability.
 - The current organizational construct of TRANSCOM or DLA is not the obvious choice for the lead Combatant Commander or JTF for logistics, because of process, cultural and budgetary barriers. The current DDOC and Theater Operations Centers are not the panacea making the process better because they are just an additional level of operations center that does not rid the system of duplications. No single office currently has a comprehensive view of all logistics capabilities and initiatives across the Services or DLA.
 - The TRANSCOM model cannot become like SOCOM model because it would violate Title 10 Service responsibilities and people would not come on board.
 - Wars are only good to effect change at the tactical level. After the action, culture remains an inhibitor and the Services no longer practice the unity of the battlefield, rather they go back to training the old way on the old system – not the way they fought. The tactical lessons learned are not being brought back and integrated into the strategic logistics network.

“To-Be” Concepts in Logistics Transformation

- Any solution needs to place all Service “4s”, relevant agencies and commands, and industry together in the same room. Industry is critical for the knowledge and ability to state the feasibility of potential solutions that the DoD lacks. It would be a 3-Star/VP Task Force that could define the way ahead with an agreed upon architecture, portfolio management, ERP, etc. We need a clear process-driven plan that works out exactly what needs to be implemented, with the authority to act.
 - Ideally, there would be a Combatant Commander in charge, following the example of the redefinition of C4ISR, and STRATCOM and DISA. There is a clearly defined working relationship with Joint Forces Command that is responsible to make the requirements to solutions and operations process work. The Service “6s” support the new status because they have a 4-Star Combatant Commander to fight for their interests from end to end and a clear chain of enterprise command. STRATCOM is a good model because of the experience there of a fully empowered commander able to encourage, and sometimes force change in spite of organizational resistance.
 - Any solution would have to start at the top, defining what needs to be done and allow synchronization with the bottom. A commander in charge and excited partners could fire up the chain of command to overcome any backlash and cultural inhibitors. When the Secretaries and the Joint Chiefs of Staff agree, the process becomes easier to implement.
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6. Lieutenant General Robert Dail (2-2005)

Lieutenant General Robert Dail is Deputy Commander, U.S. Transportation Command (TRANSCOM) and previously he was the TRANSCOM Director of Operations.

“As-Is” Issues in Logistics Transformation

- TRANSCOM has come to an agreement with commercial industry partners on how to properly phase them into the transportation network so that it decreases the possible repercussions to the industry and the national economy. In that, TRANSCOM has the authority over the contractors to require compliance with system architectures to allow for reliability and visibility, that same authority should exist in dealing with the Services.
- TRANSCOM continues to work on centralizing the command and control centers of the strategic base. We are bringing in cross-functional experts to assist with the development of unified information systems for TRANSCOM to control and reducing the redundancy that exists, e.g. legal offices.
- TRANSCOM is creating a joint network to support deployment distribution to feed into the operational centers at Scott AFB, DLA and any other virtual command center. This is being modeled after the success of CENTCOM to continue synchronizing the strategic base.
- The DoD and Services can learn from the difficulties of the logistics transformation within industry. The difficulties and failures in logistics transformations within industry are a result, in part due to the belief that the industry can buy an ERP System that will be the silver bullet to streamline and fix all their supply chain problems, however it is not that simple. Investments in technology alone will not be successful. Transformation takes time and numerous baby steps are necessary.

“To-Be” Concepts for Logistics Transformation

- TRANSCOM as the Distribution Process Owner needs to be codified into some form of charter, statutory legislation to avoid the discrepancies occurring when the inevitable rotation of senior civilian leadership occurs. The details of responsibilities are still evolving and being defined using the initial memorandum by the Secretary of Defense as the foundation.
- There needs to be a centralizing authority, through a DoD directive that would be the guiding manager offering a top-down, strategic based vision to overcome all the stove-piping occurring with the multitude of transformation initiatives within each of the Services. Having the authority to enforce the requirement for new systems, platforms, interfaces, etc in the logistics system to link into a centrally managed scheme and is visible across the entire supply chain.
- There is no desire to own the support battalion or be in charge of the storage department, etc, but rather the ability to know and understand what is being consumed to most adequately cover the strategic and operational legs. In this, the

process owner needs to have the budgetary authority to veto a system in development if it does not satisfy the joint requirements. Without this budgetary authority, any central logistics command will be powerless to effect true change.

7. Mr. Jon Dittmer, Oracle Corporation (4-05-2005)

Mr. Jon Dittmer is a Program Manager for Oracle Defense Operations. Previously he was a U.S. Air Force Lieutenant Colonel and Chief of the Air Force's Supply Systems Division in Montgomery, AL.

“As-Is” Issues in Logistics Transformation

- The Air Force appears to be primarily concerned with its own logistics environment now. They face quite a challenge in updating and integrating hundreds of legacy systems, paying a lot of attention to logistics initiatives of the other services is sure to be secondary. The Air Force position has always been to address interoperability at some level, but it is not as high of a priority as its internal transformation. The perception is that the best return on investment is to focus on the internal Air Force process transformation.
- The ECSS evaluation supports transformation by focusing on achieving a higher level of process satisfaction, rather than simply meeting low-level requirements. At the moment, the Air Force remains very influenced by their legacy environments as the process baseline for logistics. Therefore, they risk evaluating systems of the future without looking much beyond the functional baseline in the legacy processes. This risk is not unique to them; any attempt to update or transform legacy systems will carry this risk.
- The cultural gaps and change management issues in DoD are so deeply structured, it is difficult for DoD to act as one organization. But we have selected processes that cross service boundaries and need to reengineer those processes, but we're just beginning to address them.
- We are still finding the right balance between Business Process Reengineering and implementation. The services do not want to pay the costs of maintaining legacy systems. But when they try to move beyond legacy systems, they find it difficult to do proper BPR and governance, due to limitations in expertise, cultural barriers or patience.

“To-Be” Concepts for Logistics Transformation

- The total lifecycle costs, the huge sustainment costs, may be significant in all the services for maintaining business processes within these new ERP environments. We need a governance process in place that constantly reviews business process metrics, including interoperability metrics. We need to put an architecture in place that supports a flexible process model. The services need to make an investment in architecture and evaluate the capability of tools to simplify

- processes. The technical aspects of interoperability are not that difficult; for example both SAP and Oracle can interoperate with each other.
- Most organizations cannot afford to do two to three years of BPR, with minor pilot implementations. What is key is being able to slice off mature pieces of the enterprise, where you are confident you've got a solid operational model, and implement those areas modularly. For example, processes are mature and will not change much in basic flightline maintenance, at the demand end of the supply chain, where base level functions are a solid operation. In another example, processes are mature on the retail end, the "deliver" portion of the supply chain, where enterprise asset visibility is achieved by implementing simple business processes. On the other hand, you need to focus on BPR in less mature areas such as procurement reengineering where processes may not be operationally mature and where lessons learned from industry are readily available. Similarly, pipeline issues associated with the more complex wholesale part of materiel management require more BPR, because of abundant policies and resistance to change. We need to piece-meal the implementations to start to see an incremental return on your investment.
 - A large part of the Air Force logistics legacy environment is focused on financial management, especially on the supply side. I think the Air Force maintains way too much financial capability in the logistics environment. Logistics and finance have competing priorities, contradictory requirements and communities who need to communicate better. They need to be separated at the process definition and system levels. However, the challenge moving forward in all these modernization efforts is that we end up repeating a lot of that past functionality, even when it's not the best process.

8. Captain Bernard Dunn and Commander Steve MacDonald (4-19-2005)

Captain Bernard Dunn is the Branch Head for the Navy's Logistics Operations Programs & Policy Division. Commander Steve MacDonald manages Supply Operations and Policy.

"As-Is" Issues in Logistics Transformation

- Current transformation efforts include building on CNO's *SEA POWER 21* strategy. This includes: A Human Capital strategy, transformation of personnel structures, a focus on readiness including refinement of our Fleet Response Plan (FRP), increase operational availability in the Fleet, and leverage efforts ongoing in Sea Trial, Sea Enterprise, Sea Warrior, and Sea Strike, Sea Shield, SeaBasing, and FORCEnet - all elements of *SEA POWER 21*.
- "Sea Enterprise" includes a family of logistics improvements initiatives, including Virtual SYSCOM, and Legacy System Rationalization (LSR). LSR is allowing the Navy to identify redundant applications. Through the Functional Area

Manager (FAM) business case analysis process, for example, only 16 of over 60 distribution systems were identified to be maintained.

- The Navy is involved in many (joint) transformational efforts, including: development of the JDDOC Template, participation on the core and writing teams of the Joint Distribution Joint Integrating Capability Team. (JD JIC), and in Joint Theater Logistics (JTL) to list a few. Presently, JDDOC-IPT is in the midst of drawing the organizational construct.
- The full context of Joint Theater Logistics (JTL) is being refined. All discussions are at a very high level, talking about visions and capabilities, and attempting to define the commonalities and unique roles for the Services in logistics.

“To-Be” Concepts in Logistics Transformation

- The Navy is engaged in, and is fully supportive of the number of joint (transformation) initiatives.
- SeaBasing is part of the Navy’s *SEA POWER 21* strategy that is still in the developmental phase of the operations concept. Much of the vision outlines CONOPS for the 2015 timeframe and beyond. The SeaBase strategy is being created with jointness in mind and will not only support logistics efforts but will be crucial to increased access for operations and joint operations.
- Jointness needs to be based on the needs and capabilities of each of the Services. For example, in OIF, Navy Cargo Handling Units are assisting in the port of debarkation. Likewise, it was recognized that the Navy had welding capabilities and they were flown into theater to assist in up-armoring the HMMWVs. A joint process mapping activity requires knowing specific needs and capabilities of each Service.
- The Navy is looking for opportunities to converge capabilities and offer the unique Navy capabilities to the joint force. Communication and the right dialogue at the right level is key.

9. Mr. Jay Erb (4-8-2005)

Mr. John “Jay” Erb is the Deputy Director for Strategic Logistics, The Joint Staff. Previously he was the Deputy for Logistics Readiness at the Joint Staff.

"As-Is" Issues in Logistics Transformation

- OIF provided joint experiences, such as the Marines adopting Army systems. Joint Forces Command and the Joint Staff are looking at these lessons learned. Common components for jointness including identifying common warfighting environments across all the services, and their logistics processes: sea-based logistics processes, air-based logistics processes and land-based logistics processes.

- Everyone in the Services and Joint agencies agrees that logistics interoperability does not yet exist, except in isolated cases. But the current state is far better than even the recent past. Full integration probably will never occur for all processes. Four years ago, services logisticians refused to share much of their data. Since then, senior logisticians have agreed that corporate data need to be shared, and now the logistics community is in the first phase of executing that agreement.
- Based on a key document, the GCSS capstone document, all Services have to provide an integrated data environment (IDE). The first phase of integration may focus on internal systems, but the IDE architecture is supposed to have external interfaces to the Joint agencies and other Services. JROC mandated language in the capstone document requires data sharing and timeliness of data made available.
- From 2001 to 2004, logistics initiative PMO's met semi-annually to share program information. However, moving beyond PowerPoints to actual implementation of interoperability could not occur at that organizational level. Therefore, J4 has started to hold recurring meetings with program system architects, and a second track of monthly meetings with data architects and data managers. Their discussions focus on potential touchpoints between logistics systems. For example, some specific touchpoints can be readily identified between GCSS-A and the Defense Integrated Military Human Resources System (DIMHRS).
- Communications within programs between PMO's and their own staff can be difficult enough, given the very large scale and variety of systems in any single logistics transformation initiative. Communications between programs, especially between different Services, is just starting to produce executable results in the last six months.

"To-Be" Concepts in Logistics Transformation

- J4 is now starting work on a joint logistics data model, including naming conventions and business process definitions. This effort has just started in the last quarter. As an initial step, the team has gone back into the Defense Data Dictionary to determine the previous “owners” of specific data elements. The overall task requires identifying who is responsible for each element in the Data Dictionary, literally thousands of elements and attributes, and moving these over to a metadata repository. Each agency and service is using XML, but without a common metadata repository, they do not have a common map.
- One possible approach is to hook up the twelve Service and Joint IDE's into a Logistics Enterprise IDE, possibly under the process ownership of DLA. This builds on the capstone document's mandate to the services to identify authoritative data sources for their local IDE's. All PM's should be at some development stage in creating their IDE; some may call it their data warehouse within a particular software application or ERP application, but the requirements are the same.
- In the last month, the data leads started a project, working with DISA, to identify leads for data required by Combatant Command Combat Service Support staffs in an inventory of all communities of interest throughout DoD.

- Logistics for combat support requires joint access to data that includes both logistics data, and command and control data. In fact, only about 55% of the data needed will come from the logistics communities of interest. For example, weather is crucial to combat support and logistics management, but CSS elements do not own the weather process and data - the DoD has about 50 iterations of weather data, most of which is replicated and latent.
- Every operation requires unique data feeds across joint systems. The architecture and data repository being created has to support flexibility for unexpected situations.
- New systems are not transformational, from a joint perspective, on their own. As trust occurs between organizations due to horizontal process-sharing, transformation will evolve.
- OSD leadership in setting standards and mapping joint processes would be helpful.

10. Vice Admiral Holder (3-22-2005)

Vice Admiral Gordon Holder (Ret.) is a Principal with Booz Allen Hamilton. Previously he was the Joint Staff Director for Logistics (J-4).

“As-Is” Issues in Logistics Transformation

- Some hole in the logistics supply chain will always exist; 100% performance will never happen. War tempo performance, including ad-hoc work-arounds, will provide short-run expensive performance but cannot be maintained over the long haul.
- Integration between finance transformation and logistics transformation initiatives is difficult. Ideally, we could stop all ERP and other logistics initiatives until the finance system was completely up to date, but that’s impossible.
- The status quo financial system is the wrong set up. We need to bring AT&L money up to one individual so that it is brought top down and then horizontally integrated across systems, rather than stovepiped.
- Internal accounting is not clearly defined across Services – for example, there is no common definition for a munitions account. Therefore, materiel is transferred but often untraceable.
- In OIF, the status quo was ad-hoc systems, jury-rigged, allowing only partial views of data. When the Marine Corps was attached as a subordinate unit to the Army, the Army could not see their supply status.
- TRANSCOM is effectively executing transformation, but with General Handy leaving, along with cultural barriers, there’s a risk that these efforts won’t persist at the same level.
- One of the major risks for logistics transformation is the constant shifts in personnel, leadership, and programs. The risk is a lack of persistence within logistics organizations.

“To-Be” Concepts for Logistics Transformation

- An overview or big map of all logistics initiatives would help to let people see where we’re going to go.
- A CSIS study provided several useful proposals, including a recommendation that the Joint Staff J4 be moved up to OSD as DUSD LM&R. This was an interesting concept, but didn’t allow for continuing direct access to CJCS. We need absolute directive authority for logistics transformation from the OSD.
- We need an independent, cohesive Joint Logistics system, an overarching system that allows security and integration for multiple vendors.
- Logistics transformation needs to be generated from OSD with outsourcing to an independent integrator. DoD needs to be constantly involved to avoid backlash and false views of “it won’t work.”
- Logistics transformation needs to be coordinated with a transformation of the financial systems, with strong horizontal connectivity. RFID and transformed financial systems are strong drivers for horizontal integration. OSD needs to require industry to coordinate systems horizontally.
- We need an enforcement document that actually has an enforcement mechanism.

11. General Paul Kern (Ret.) (3-23-2005)

General Paul Kern (Ret.) is a Senior Counselor with The Cohen Group. Previously he served as the Commanding General of the Army Material Command.

“As-Is” Issues in Logistics Transformation

- In his experience with CENTCOM DDOC he found that organizations do not want to give up turf, due to resource investments and cultural barriers. The cultural barriers need to be the focus of change management efforts. Change management to overcome culture needs to be top-down, coming from OSD and Joint Staff, since it is most effective if they do it together.
- The constraint on the Logistics Modernization Program in the Army is that it has to be technically and legally compliant with financial systems, which are being transformed at the same time. It can be done.
- Central IT issue today is similar to that faced by the U.S. government from the Civil War to the early 1900s, when they wanted to build guns with interchangeable parts from different vendors. The vendors wanted to sell guns that did not have interchangeable parts, so they could be the sole suppliers. It took decades to achieve a degree of interchangeable parts in weaponry. Today’s Winchester and Colt rivalry is the competition between Oracle and SAP. A barrier is the issue of intellectual property rights.
- In order processing, the real missing bridge is the level where the part is ordered – to be able to see where it is, that the order took, and that it is shipped and when

you'll get it. Visibility into the financial or transaction processing function is a second priority.

“To-Be” Concepts in Logistics Transformation

- We need interchangeable information systems, between Oracle, SAP and similar vendors. We need data standards to allow them to exchange information. They should accept the common issued standards. The way you display information can adapt to different users, but we need a common understanding of the underlying data.
- DLA is an organization which wields a big enough club to effect real transformation in financial management reform and supply chain management reform.
- In DoD supply chain financial transactions, we need to replicate the agile data information systems and tracking used by the worldwide credit card industry, with national or international standards including XML.
- Logistics transformation will happen when CEOs all meet to address and enforce change in standards and alignment. Key participants should be the OSD and the CEOs of SAP, Oracle, FEDEX, DHL, etc.
- Title 10 is not necessarily a barrier to high-level coordination of logistics transformation. For example, medical and transportation processes are managed more horizontally than logistics. Title 10 can give Congress the ability to leverage change. On the other hand, it can also be used as protection from change for the Services and the Congressional Committees.
- We need a central plan for all of DoD logistics, showing how we get there, pulling all these systems, the comptroller, acquisitions and logistics communities, under a single program office.

12. Vice Admiral Keith Lippert (4-07-2005)

Vice Admiral Keith Lippert is the Director of the Defense Logistics Agency. Previously he served as Commander of Naval Supply Systems Command and 41st Chief of the Supply Corps.

“As-Is” Issues in Logistics Transformation

- The statement that the DoD logistics system is broken is inaccurate. The issue needs to be placed in historical context. When the U.S. military went into Afghanistan and Iraq, the forces were sustained. Likewise, we had the ability before combat operations in OIF to see that the level of readiness across the DoD was all green. Likewise, the Navy is able to deploy 7 aircraft carriers this summer without breaking the logistics system. Progress has been made with regards to asset visibility, requisition, and distribution. Most logistics initiatives are in place or in development.

- The joint effort of DLA and TRANSCOM with the establishment of the CDDOC solved distribution problems in theater, and cleared the bottleneck at the port of debarkation, including retrograde distribution.
- The success of the CDDOC has led to the establishment of a DDOC and Joint Logistics Command at each of the Combatant Commands. The Joint Logistics Command is a supply chain manager that reports to the Combatant Commander.
- Active RFID was placed on everything that left the depots at the container level, but asset visibility is still not solved at a pallet level, or at the last tactical mile. In OIF, initial problems with too few readers and untrained users were mostly resolved.
- The quantity of requirements for OIF was unexpected in spite of efforts to build up the industrial base, resulting in a temporary lower fill rate and back orders.

“To-Be” Concepts in Logistics Transformation

- DLA, with assistance from Bearing Point, is developing a new Customer Relations Management strategy that places liaison officials across all the Combatant Commands, with a single DLA POC in each theater. Over 100 customer service reps are working to understand requirements. DLA meets with the other logistics 3-Stars, and uses Performance-Based Agreements and a logistics council to achieve process improvements.
- DLA is presently testing, and hoping to expand for all of DoD, a web-enabled Integrated Data Environment (IDE) for requisition and ordering. The hope is to decrease costs and customer wait time because the customer would be able to locate the item at the nearest location. The IDE uses Oracle database software.
- LA has begun the full roll-out of its SAP ERP System, with Manugistics providing demand planning, in which 200,000 new items are added monthly. The SAP application's data integrity requirement forces a data discipline on DLA legacy data. In the long run, it will replace legacy systems. However, it will continue to take time to train everyone and even longer to achieve cultural acceptance. Payback in 3 years is possible due to smaller staffing, faster customer response and reduced inventory costs.
- OSD needs to continue with its role and responsibility by taking the lead and communicating clear and effective interoperability standards for new systems. Maybe, given the current lack of these standards, it is realistic to plan for interoperability as a 2nd goal after everyone has implemented their ERP systems.
- ERP systems have great capabilities but require major commitments of resources and years to implement. DLA cannot be in a build mode forever. Control over configuration management of the COTS is crucial, both for DLA and for external interoperability. Therefore, a control limit permits only a small number of RICE objects (Reports, Interfaces, Conversions, Enhancements) to the SAP COTS.
- DLA's procurement requirements exceeded SAP software capabilities, for both variety and quantity of parts. Therefore, SAP is creating an entirely new software program for the DLA procurement system.

13. Major General Wade McManus (Ret.) (3-30-2005)

Major General Wade McManus (Ret.) is the Vice President for Strategic Logistics at Northrop Grumman Mission Systems. Previously he served as the Commanding General of the U.S. Army Operations Support Command at Rock Island Arsenal.

“As-Is” Issues in Logistics Transformation

- Without assured information for the warfighter, he will multiple order everything to make sure that something he needs gets there in a timely manner.
- We have to move beyond just demand forecasting, to obtaining as much advance planning information as technology can provide. For example, TRANSCOM will see materiel when it's offered for transport, but if everything has to go by air, TRANSCOM only has a fixed number of platforms. Typically everything is Priority 1. The supporting Combatant Commander has to make priorities on his own, but if he can see the information far enough in advance, he can devise a better way to get the materiel to the theater, and to optimize his fleet. This provides better fidelity to the customer as to when the goods will actually arrive.
- We need new thinking about how to source units with ammunition. At Rock Island, at the Joint Munitions Command, he began working with TRANSCOM on ammunition distribution, which takes a big chunk of the pipeline during war. Two units were going to be deployed at the same time, the 101st Airborne and a Marine Expeditionary Force. Both claimed ownership of the same basic loads of ammo stored at the same location in Indiana. The reality faced by the logistician and the warfighter was a fixed capacity facility, one rail line, limited trucks and an ice storm.
- Jointness in logistics is about the coalition of the willing, and some are more willing to be joint than others. The Battlespace encourages jointness at the tactical level. The biggest cultural problem is Services who say “I’m joint enough as it is.” In discussions concerning how to rethink theater support, there has not been total agreement between the Air Force and the Army as to the nature of the problem or the need for jointness.
- If you are in a joint billet, you depend on the voluntary collaboration of the Services membership. You can support jointness currently, but you cannot require it. There is no enforcement mechanism.
- Financial problems are a show-stopper. Financial systems are real stovepipes with more points of friction than are manageable. In OIF, financial systems were independent and created difficulties in generating data needed to get funds to pay people. Financial processes are now a constraint limiting supply chain management transformation. If you walk into an ammo yard, whoever paid for the ammunition claims ownership.

“To-Be” Concepts in Logistics Transformation

- Title 10 is problematic for joint logistics transformation. Some say we’ll never change Title 10 – that we’ll have to change the mission, alignment and

- responsibilities. But there may have to be some kind of adjustment to Title 10 to permit logistics coordination at a higher level than just the services.
- As we rethink the whole logistics domain, we need to keep focus on the service concepts of modularity and an agile expeditionary force, to achieve better precision in advanced planning, to optimize capabilities, and most importantly, to deliver assured information.
 - Transformation requires us to ask hard questions about limited resources. BRAC is a good example as a driver for transformation that requires making hard choices. We have to decide what we can afford and begin avoiding duplication.
 - The warfighter needs assured information more than predictability.
 - Ammunition support needs to move to force packaging rather than the traditional packaging. We need to require the services to validate ammunition when they validate forces for deployment. Other solutions include stock pre-positioning for rapid force deployment.
 - We need to centralize financial management by integrating financial systems to create more financial agility to support the operational domain.
 - We need new leadership to rethink jointness. New process initiatives coming from DoD are important to generate change management. With those Services who are less committed to jointness, we need to strategically and surgically identify those events that can have the biggest joint impact.
 - When OIF started, ammunition was managed as a percentage of the budget, without a readiness management system. We worked to establish a common frame of reference among the Services. We had to cobble out common processes and measurement tools, but we could see individual databases. This is an example of a highly selective area where we were able to create joint efforts and effect change.
 - For change management towards joint logistics transformation to succeed, more personnel need to be rotated through joint operations and share the common environment.
 - Joint games that include a logistics component are useful for the Services to learn about each other's capabilities and how to obtain them. Services are often unwilling to give up their resources or capabilities to each other, but are proud of them, and in a gaming environment, useful information is often exposed.
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14. Mr. John Nyere, Office of the Secretary of Defense (4-25-2005)

Mr. John Nyere is responsible for multiple tasks associated with the realization of the Future Logistics Enterprise (FLE) for the OSD Assistant Deputy Under Secretary of Defense for Logistics Systems Modernization (LSM). He was recently elected to the Supply-Chain Council's Technical Development Steering Committee.

“As-Is” Issues in Logistics Transformation

- The Business Management Modernization Program, in the last few years, has not focused on projects that would provide short-term Return on Investment for the Warfighter. In fact, there may have been no identifiable contribution for the warfighter. Now the program is being realigned to focus on support for the warfighter.
- The realigned view of business management is based on five horizontal processes: personnel management, weapon system lifecycle management, real property and installation lifecycle management, materiel supply and service management, and financial management. This approach restructures the business domains into end-to-end business missions.
- A current problem is an incorrect focus on systems, rather than on data. In development, we jump from deciding on an architecture to building a system. The measure of effectiveness is how many legacy systems you can eliminate with a new system. In the private sector, the measures of effectiveness are supplier-facing and customer-facing, with a balanced scorecard approach. To help solve this problem, we used in logistics the private sector SCOR model as a template for business alignment. Of all the types of metrics, reliability is the most important measure for logistics as determined by our customer facing organization – US Transportation Command. The DoD leadership has to decide the right mix of getting stuff fastest, cheapest or best - and different situations may require a different mix. The rebaselined BMMP program will be taking on the metrics over this summer and put them in their transition plan.
- The TRANSCOM and DLA efforts are enterprise-wide, defining business processes and objects, and the owners of those processes and objects. They are now focused on DLA and TRANSCOM common processes which will enable transformation with Unique Item Identification and Radio Frequency Identification and business objects such as bills of material (used throughout a product’s lifecycle), customer masters, vendor masters, item masters for the DoD Enterprise.

“To-Be” Concepts in Logistics Transformation

- The new BMMP model is rapid implementation for clearly defined DoD and warfighter Return on Investment. Architecture is a means to an end, not the end itself. We want to replace large investments in architecture and other efforts with selected investments with 6 month to 18 month ROI periods and clear benefits to the warfighter. More than fifty initiatives are being prioritized to see which meet performance goals. We want to accelerate business transformation.
- A shared view of visibility across DoD is required, and a willingness to collaborate. To succeed, you need to empower the agencies and their component organizations. You are less likely to accomplish logistics transformation if you keep the efforts at a high level, or just focus on new architectures.
- An overall DoD logistics (materiel and services) process is needed. TRANSCOM and DLA are leading our efforts which even deployment. Establishment of a desired end-to-end distribution process and associated data exchange requirements is needed give us the requisite visibility. In DoD, if we have “clean

- process” we will get Financial Visibility, Asset Visibility, In-Transit Visibility, proper asset valuation, and common supplier engagement.. Who will negotiate with COCOM for service levels? How will the Army, Navy, Air Force and Marines integrate their logistics architectures into the DoD enterprise will be a result of our efforts to establish tiered accountability.
- A number of ways of thinking must change. DoD needs to focus on a common process, where it makes sense even single solutions (DIHMRS), and prescribe DoD data for the enterprise – in effect data-centric thinking, not system-centric thinking. DoD must change culture, from a culture of silo-oriented thinking to a culture core business mission areas. This change must not be just by the OSD, but it will requires a tiered approach through the agencies and services.
 - The UID (unique item identifier) program - a family (hierarchy) of UIDs will give us precision in business. With “Item” Unique Identification we can attribute a component to a manufacturer, giving it a unique part id and serial number. This has been embraced by industry and by our weapons systems lifecycle maintainers who can better perform Product lifecycle management and assess performance of products. Once the family of UIDs are adopted, then traceability will be possible to achieve a clean financial audit. The UID program, and RFID, are must-haves for logistics transformation. A completely enabled family of UIDs would have made BRAC a lot easier.
 - Resource challenges include identifying scarce leadership, over-dependence on contractors for thought leadership, lack of customer-orientation among contractors, and a resulting lack of managerial confidence in decision making.
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**15. Colonel Robert Ruark, Lieutenant Colonel James Turlip,
Mr. Gavin McCarthy, Marine Corps
(3-29-2005)**

Colonel Robert Ruark is the Head of the United States Marines Corps Logistics Enterprise Integration Center. Lieutenant Colonel James Turlip is the Deputy for the Logistics Enterprise Integration Center, United States Marine Corps. Mr. Gavin McCarthy is the Logistics Architecture Consultant to the Marines Corps Modernization Initiatives.

“As-Is” Issues in Logistics Transformation

- The Marine Corps Logistics Modernization received the Senior Leadership of the Marine Corps’ support in Jan 2004. Since then, the Commandant has communicated his support to the Operating Forces and supporting establishment. Consequently, the program is receiving resource priority. The Marines have learned that they need to professionally communicate and market Logistics Modernizations concepts and initiatives. Part of the challenge had been ensuring the right message is delivered to the right audience, e.g. delivering a tactical level message to the Operating Forces, and a strategic message to those agencies/Services in the Beltway.

- The Marines have realized that change management needs to occur from the strategic to tactical level. Accordingly, they have invested in field level resources at the Marine Expeditionary Forces that have added 60 specially screened logistics Marines at the tactical level in support of this effort.
- Change Management is occurring often behind the scenes, the Marines have invested resources, notably a squad sized Transition Task Force that will help institutionalize the Logistics Modernization initiatives. This will occur in the pillars of DOTMLPF (changes to doctrine, organization, training, material, leadership, personnel and facilities) over an 18-24 month period.
- The GIG currently has no standardized data feeds horizontally. However, the OSD has dissolved the traditional seven domains and is restructuring for cross-functional integration.
- For commodities like rations or ammo, it doesn't matter who the supplier is as long as everyone can see it, especially in-transit visibility. Although active RFID devices were successful during the second phase of OIF, in a mature theater, the materiel will likely always get out ahead of the RFID readers in any new warfare environment. In a new, immature theater, planners can expect a repeat of the difficulties with initial phase of OIF's lack of infrastructure, until hardware and software is in place for tracking RFID.
- The Marine Corps remains an expeditionary force, capable of rapid deployment worldwide. Accordingly, their logistics chain must be extremely flexible and responsive to their needs. Such an expeditionary nature requires a different focus than other Services, since the Corps operates in both maritime and land environments. The Corps has worked closely with the Army, Navy and USTRANSCOM to leverage the best distribution capabilities of each to support its expeditionary nature.
- One of the major distribution problems in OIF 1 was that the Army was not resourced properly in terms of equipment, people, systems and processes to support theater distribution. The real takeaway is that the Army was unprepared to handle the full scope of theater distribution they were supposed to handle, and it came down to the Marines to support themselves thru contracted commercial transportation, e.g. workarounds such as local trucking companies in Kuwait and Iraq, assets in the absence of that support until the Army was finally prepared to take on this responsibility (well after hostilities were underway). Pallets needed to be constantly reloaded without a "destination" approach.
- The Marines are leveraging current Army logistics systems and long-range communications in the Iraq theater of operations to obtain better visibility of its logistics and gain real time situation awareness. The Corps has even developed interfaces between its legacy supply and readiness systems and the Army's to enable cross-Service visibility. These improvements in interoperability are essential to guiding the Corps' path to the future as it develops the Global Combat Support System Marine Corps and fields expeditionary communications capabilities.

“To-Be” Concepts in Logistics Transformation

- Because the Marines architected their logistics transformation efforts first, they ensured that each system was DII-COE compliant. JROC has to agree with system requirements. They conducted a warfighter analysis first.
- As long as they're in CENTCOM, the Marines are using Army systems and communications systems as “bridge solutions” until they field GCSS-MC.
- A future trend is to create a lighter footprint, especially in logistics transformation efforts.
- As currently planned, the initiative could possibly sub-optimize the garrison process in favor of using processes that first and foremost support the deployed environment.
- Oracle and SAP both have connectors and will use them.

Appendix 2: Logistics Transformation Initiatives and Organizations

There are numerous logistics transformation initiatives and organizations throughout the Services, DoD and Agencies, many of which were referenced during the interview process. The following is a brief description and definition of a selection.

Logistics Transformation Initiatives

Battle Command Sustainment Support System (BCS3): BCS3 integrates situational awareness of key Combat Support System mission areas of arming the force, fueling the force, manning the force, fixing the force, and moving the force.

Deployment and Distribution Operations Center (DDOC): The DDOC is a joint TRANSCOM/DLA effort established to improve logistics support in theater with a purpose of identifying efficiencies and effectiveness in the Department of Defense distribution processes for both inter and intra theater.

Distribution Process Owner (DPO): TRANSCOM has been designated as the DoD's Distribution Process Owner (DPO). The DPO is supposed to serve as the single entity to execute the strategic distribution system. The focus of the DPO extends from source of supply to a point forward in a theater as defined by the regional combatant commander.

Expeditionary Combat Support System (ECSS): The ECSS is the Air Force's COTS based system that will enable the eLog21 future logistics vision by leveraging an ERP as its primary system. The ECSS has an added objective of retiring the current legacy systems across the logistics domain.

Global Combat Support System (GCSS): The GCSS concept provides the joint warfighter with a single, end-to-end capability to manage and monitor units, personnel, and equipment from mobilization through deployment, employment, sustainment, redeployment, and demobilization. The GCSS concept forms a family of systems to incorporate the individual service efforts, resulting in the GCSS-A (Army), GCSS-MC (Marines Corps), etc.

Integrated Data Environment (IDE): DLA and the Joint Staff are in the development phase of an IDE. The IDE is intended to be a complete integration engine that addresses business processes, data strategy, operations and technologies. The IDE should connect critical logistics functions within an interoperable technology infrastructure that improves data access, communications and cost savings.

Joint Logistics Transformation Vision: The logistics transformation across the Services and DoD is described in both visionary and programmatic terms through numerous white papers. Along with the Quadrennial Defense Review they highlight the benefits of "jointness" for the warfighter and the logistics transformation. A limited selection includes the following:

- Joint Staffs, *Joint Vision 2020*

- Army G-4 White Paper, *Delivering Material Readiness to the Army*
- U.S. Army Material Command, *Transformation White Paper*
- Office of Force Transformation, *Operational Sense and Respond Logistics: Coevolution of an Adaptive Enterprise Capability*
- Air Force, *Expeditionary Logistics for the 21st Century – Campaign Plan*

Logistics Modernization Program: The Army system used to store logistics data pertinent to the operations of the Federal supply system. It is intended to be the replacement system for the Commodity Command Standard System (CCSS).

Single Army Logistics Enterprise (SALE): The Army's ERP vision created by the DoD under agreement with the Army Chief of Staff to enhance the Army's transformation to the Objective Force.

Interoperability Organizations and Standards

Commands, Directorates and Centers⁸

- Defense Information Systems Agency (DISA) Interoperability Directorate (<http://www.itsi.disa.mil/standards.html>)
- Interoperability Technology Demonstration Center (ITDC)
- Interoperability Clearing House (ICH) (<http://www.ichnet.org>)
- Joint Interoperability and Integration Directorate (JI&I) (<http://www.teao.saic.com/jfcom/html/charter.html>)
- Joint Systems Integration Command (www.jfcom.mil/about/com_jsic.htm)
- Requirements and Integration Directorate, J8 (www.jfcom.mil/about/abt_j8.htm)
- Joint Interoperability Test Command (JITC) (<http://jitc.fhu.disa.mil/>)
- Joint Readiness Clinical Advisory Board (JRCAB) (<http://www.jrcab.army.mil/>)
- Open Systems Joint Task Force (OSJTF) (<http://www.acq.osd.mil/osjtf/>)
- Joint Aeronautical Commanders' Group (JACG) (<https://jacg.wpafb.af.mil/>)
- Networks & Information Integration (<http://www.defenselink.mil/nii/>)

Standards and Strategies

- Defense Information Initiative Common Operating Environment (DII/COE) (also called COE) (<http://www.dis.anl.gov/is/DIICOE.htm> l)
- Joint Technical Architecture (JTA) (<http://jta.disa.mil/>)
- Joint Operations Concept (<http://www.dtic.mil/futurejointwarfare/>)

Demonstrations and Test Beds

- Joint Distributed Engineering Plant (DEP) (<http://jitc.fhu.disa.mil/jdep/>)
- Joint Distributed Engineering Plant (JDEP) (<http://jitc.fhu.disa.mil/jdep/>)
- Joint Warrior Interoperability Demonstration (JWID) (<http://www.jwid.js.mil/>)
- Joint Interoperability and Systems Technology for Test and Training (JIST³) (<http://jcs.mil/>)

Joint Force Integration Initiatives

- Blue Force Tracking (BFT) (<http://www.fcw.com/fcw/articles/2003/0526/web-blue-05-30-03.asp>)
- Combat Identification (CID)
- (http://www.fas.org/spp/military/docops/defense/actd_mp/CID.htm)
- Family of Interoperable Operational Pictures (FIOP)
- (<http://www.dtic.mil/ndia/systems/Quinlan.pdf>)

Appendix 3: Glossary

ACTD	Advanced Concept Technology Demonstrations
AKO	Army Knowledge Online
AT&L	Acquisition, Technology and Logistics
BCS3	Battle Command Sustainment Support System
BEA-log	Business Enterprise Architecture - Logistics
BMMP	Business Management Modernization Program
BPR	Business Process Reengineering
BRAC	Base Realignment and Closure
CALL	Center for Army Lessons Learned
CDDOC	CENTCOM Distribution and Deployment Operations Center
CFLCC	Coalition Forces Land Component Commander
CJCS	Chairman, Joint Chiefs of Staff
CLOE	Common Logistics Operating Environment
COCOM	Combatant Commander
COTS	Commercial Off-the-Shelf Technologies
CSS	Combat Service Support
CSS VSAT	Combat Service Support – Very Small Aperture Terminal
C4ISR	Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance
DDOC	Deployment and Distribution Operations Center
DII/COE	Defense Information Initiative Common Operating Environment
DIMHRS	Defense Integrated Military Human Resources System
DISA	Defense Information Systems Agency
DOTMLPF	Doctrine, Organization, Training, Material, Leadership, Personnel and Facilities
DPO	Distribution Process Owner
ECSS	Expeditionary Combat Support System
ERP	Enterprise Resource Planning
FAM	Functional Area Manager
FCS	Future Combat System
FIOP	Family of Interoperable Operational Pictures
FLE	Future Logistics Enterprise
GCSS	Global Combat Support System
GCSS-A	Global Combat Support System – Army
GCSS-FoS	Global Combat Support System – Family of Systems
GCSS-MC	Global Combat Support System – Marine Corps
GIG	Global Information Grid
IDE	Integrated Data Environment

IPT	Integrated Process Team
JCIDS	Joint Capabilities Integration and Development System
JDDA	Joint Deployment Distribution Architecture
JDDOC	Joint Deployment and Distribution Operations Center
JIC	Joint Integration Concepts
JROC	Joint Requirements Oversight Council
JTA	Joint Technical Architecture
JTF	Joint Task Force
JTL	Joint Theater Logistics
LSM	Logistics Systems Modernization
LSR	Legacy System Rationalization
MEF	Marines Expeditionary Force
NDP	National Defense Panel
NII	National Information Infrastructure
OLAP	Online Analytical Processing
PM	Program Manager
PMO	Program Management Officer
PPBS	Planning, Programming and Budgeting System
RFID	Radio Frequency Identification
RICE	Reports, Interfaces, Conversions, Enhancements
ROI	Return on Investment
SALE	Single Army Logistics Environment
SCOR	Supply Chain Operations Reference Model
SEI	Software Engineering Institute
SOSI	System of Systems Interoperability
TAV	Total Asset Visibility
UCP	Unified Command Plan
UID	Unique Item Identification
USJFCOM	United States Joint Forces Command
XML	Extensible Markup Language

Endnotes:

- ¹ Morris, Edwin et al. *System of Systems Interoperability*. CMU/SEI-2004-TR-004. Software Engineering Institute, Carnegie Mellon University. April 2004. Page 57.
- ² *Ibid*, Page 20.
- ³ Bachman, Felix et al. *SEI Independent Research and Development Projects*. CMU/SEI-2003-TR-019. Software Engineering Institute, Carnegie Mellon University. Sep 2003. Page 50.
- ⁴ *Ibid*.
- ⁵ Erwin, Sandra. *National Defense Magazine*. May 2003. "Pentagon Reviewing Proposal To Create 'Logistics Command'." Attributed to Alan Estevez, the Assistant Deputy Under Secretary of Defense for Supply Chain Integration.
- ⁶ *Beyond Goldwater-Nichols: U.S. Government and Defense Reform for a New Strategic Era*. "Chapter 8: Organizing for Logistics Support." Center for Security and International Studies. To be published. Available at <http://www.csis.org>
- ⁷ Fisher, David and Smith, Dennis. "Emergent Issues In Interoperability." *Eye On Integration*. Number 3, 2004. Page 1.
- ⁸ Bachman, Page 44.