

Deputy Under Secretary of Defense (Logistics and Materiel Readiness)

Logistics Enterprise Integration and Transformation

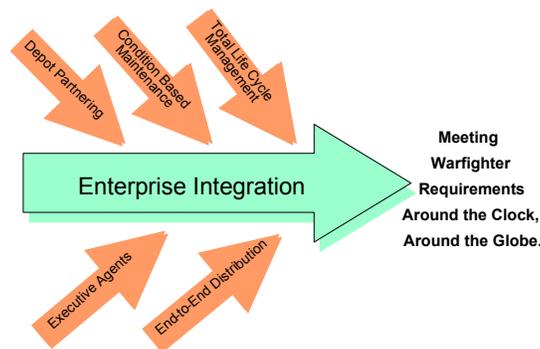
Introduction

This paper provides the strategic direction to identify and manage required changes to DOD logistics systems and processes that better support the warfighter. The strategic direction includes our vision for an integrated logistics enterprise, identifies the optimal set of business processes required to attain this vision, determines our business strategy and defines the architectural elements of the logistics enterprise. This direction was developed in concert with the DOD Future Logistics Environment (FLE) effort and its tenets. The FLE effort involves the design and implementation of a logistics framework that inherently meets the operational requirements of the National Military Strategy and the early 21st Century warfighter. Its tenets include end-to-end distribution, total life cycle systems management, and an integrated knowledge environment. Phase One of the effort with the assistance of General Officers and Senior Executive Service civilians from the Military Services, Joint Staff, Defense Logistics Agency, US Transportation Command, Defense Information Systems Agency, and the Office of the Secretary of Defense. The FLE ensures strategic logistics requirements and capabilities are directly tied not only to the warfighting CINC and tactical requirements, but to the Quadrennial Defense Review, as well.

This paper describes the management baseline we will evolve as we execute our Logistics Enterprise Integration and Transformation program. It includes the actions we must take in the near term to begin implementing the Enterprise Integration Plan. As depicted in the graphic below, the Enterprise Integration and Transformation initiative provides the enabling technology required to modernize the logistics enterprise and realize the vision described in the FLE.

Achieving the vision will require teamwork and significant commitment. The return will be immense.

Diane K. Morales
November 2001



Section I – The Vision

The Department of Defense (DoD) Logistics Enterprise exists to support the warfighter's need for materiel and information – what he/she needs, when he/she needs it, and where he/she needs it! To provide this support, we must assemble and deploy a truly integrated information and knowledge environment that will enable and improve our business processes while providing the optimal levels of economy and efficiency. We are committed to meeting warfighter requirements around the clock, around the globe through enterprise integration and end-to-end customer service. To meet this commitment, the Department must transform both business processes and the associated information systems supporting them. Moreover, we must carefully manage this change in order to realize the vision for the Logistics Enterprise.

Today the interactions between the DoD, DoD customers, and partners are characterized by paper-based transactions and by batch-processed transactions that are created and re-created in a sequential chain. While these systems and business processes and their associated transactions served us well in the past, they have not been updated to leverage today's enterprise based information technology. Even at their best, these processes and the associated systems rely on constant monitoring and human intervention. System redundancy has proliferated, resulting in multiple systems doing essentially the same thing, modified slightly here and there, customized to individual needs, wants, and desires. The result was over a thousand logistics systems -- all of which had to be sustained and maintained. In most cases the government developed these systems to meet the specific functional needs of a small user group. Too often, we store our information in specific silos, or stovepipes, serving the needs of a very small population. As a result their user base is often extremely limited, resulting in high cost per user. Often we are tied to a single contractor for support and maintenance. We spend large sums on the care and feeding of our logistics systems that remain susceptible to errors and delays that cannot be tolerated as we move to more agile and lethal forces. In short, many of our information systems are outdated, making customer interaction difficult, slow, and expensive.

To meet the Warfighter's needs for materiel at the right place and the right time, we need information systems that are integrated at the DoD enterprise level to provide near real time, accurate, and actionable data/information/knowledge about the warfighter's logistics situation. Further, we need systems that will affect the needed flow of materiel with a minimum of human intervention. Business operations must be network centric: a warfighter requirement or other support requirement (whether human or automatically generated) is known at once by all potential sources. The systems architecture responds as one to the requirement, providing near real-time feedback to the customer that creates or validates an expectation of service, offering actionable options if the full requirement will not be met.

The process of enabling the vision has already begun with the Enterprise Integration efforts currently underway within the Services and DLA. Programs that use commercial Enterprise Resource Planning (ERP) and other tools to develop modern integrated solutions to complex information issues across the DoD logistics enterprise are under way. The vision is to provide the warfighter community with improved interoperability and materiel readiness through logistics Enterprise Integration and modernized logistics systems. This will result in reduced

cost, improved quality, improved responsiveness to the customer (the warfighter), improved trading partner flexibility, and optimal benefit from our capital assets. We will provide integrated budget management, integrated financial management, and integrated fixed asset management in an environment that permits us to track progress against these metrics and to adjust where necessary.

We are focused on critical success factors including the realization that Enterprise Integration is a business issue, not just an information technology area. This is based on common, reusable best practices that support participants across the enterprise. We will complete incremental implementation with adequate training and the full backing/support of leadership. Changes to the commercial software increase risk, and implementing our vision minimizes such changes. The Logistics Enterprise Integration and Transformation activity encourages collaborative solutions and shared knowledge through policy initiatives and oversight. Moreover, we will establish appropriate forums to accelerate collaboration and education.

Section II – The Business Architecture Required to Support this Vision

The DoD Logistics Enterprise exists solely to provide the warfighter with the right supplies and equipment, and personnel in the correct condition, place, and time to support warfighting operations. An integrated environment can optimize this mission, and *Speed, efficiency and economy* are its hallmarks.

The integrated readiness environment is the integration of all functions required to support the Logistics domain. It includes (but is not limited to) the three core functions of Logistics -- Supply, Maintenance, and Transportation, and their associated sub functions and information systems. The flow of materiel and personnel is driven by information (Logistics Command and Control) and is linked to other defense enterprises (e.g., Acquisition, Finance, etc.) by an exchange of information and resources. Taken together, the physical flow of material and personnel, along with the information about those flows and the resources required to execute them define the DoD Logistics Enterprise and its relationship to other DoD enterprises (Figure 2-1).

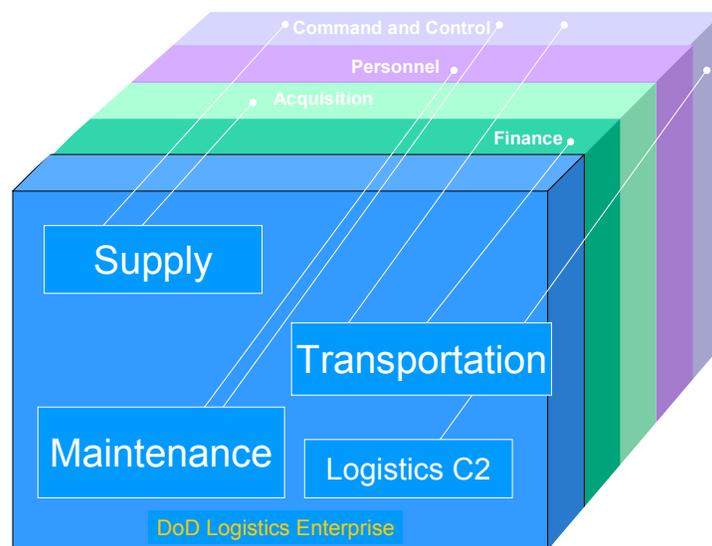


Figure 2-1: Functions, Sub-functions, and Activities of Logistics

The Department's Logistics operations have evolved to become a set of multiple, overlapping functional stovepipes. While "Second to None" operationally, these stovepipes are frequently slow, inefficient, inflexible, and uneconomic. A more critical problem is that "stovepiped" DoD Logistics systems do not provide real time, up-to-date end-to-end information required by today's warfighters. There are more than 600 logistics systems. Critical warfighting information is maintained in batch processing systems in functional or commodity stovepipes, with multiple stand-alone databases requiring multiple data entry steps for a single transaction. It is difficult, if not impossible, for operational staffs to access authoritative information needed to fully understand the impact of the logistics battlespace on overall warfighting operations.

The logistical demands of agile, joint task forces provide the imperative for a fundamentally different approach to our view of logistics business processes. The constraints of focused investment in "right sized" inventories of materiel (balanced between deployed, deployable, and propositioned assets), the need to reduce deploying force "footprint", and a focus on the creation of combat capabilities that can be employed to meet current threats must drive the structure of logistics business processes.

In this environment, the combat commander – the CINCs and the warfighter community -- as the ultimate customer of those logistics business processes, must have timely, accurate, and actionable information. In this new environment, warfighters must have high levels of confidence in the reliability of logistics processes to capture emerging patterns of demand and translate those demands into the right materiel and personnel in the right place at the right time. In such an environment, superior logistics capability is synonymous with an integrated view of the ongoing logistics functions, a view created by the deployment of enterprise information technology.

The future DoD Logistics Enterprise vision mandates a fundamentally different way of looking at the logistics business architecture. Logistics functions must be viewed and managed as *end-to-end processes* focused on producing capabilities for the warfighter across a range of activity domains, ranging from long lead-time (strategic) actions to short lead-time (tactical) actions. In the enterprise view of the DoD Logistics Business Architecture, logistics activities are organized into end-to-end processes that work together to meet military needs. Figure 2-2 depicts this enterprise view of DoD Logistics activity.

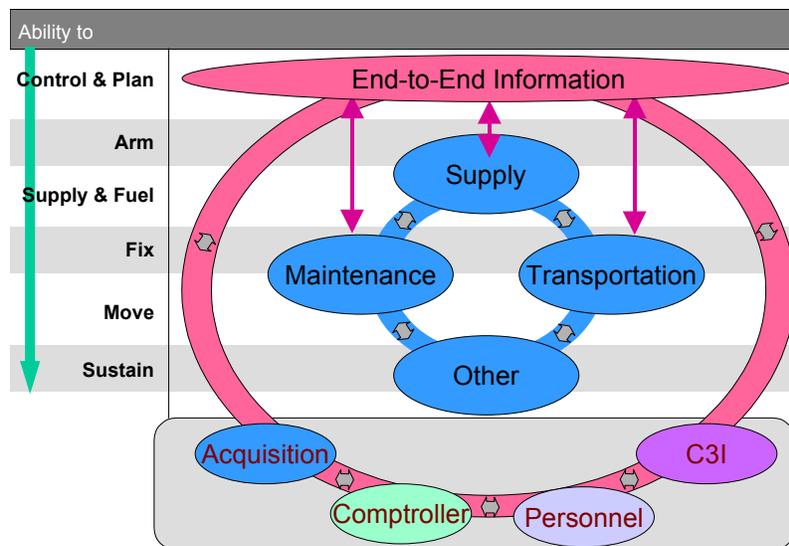


Figure 2-2: View of DoD Logistics as an Integrated Environment

An integrated environment must be viewed and managed as a well coordinated Department-wide activity, both *within* the logistics enterprise and *between* the logistics enterprise and key

interfacing enterprise. At its core, the integrated environment supports and enables the military mission by providing rapid, efficient, flexible, and economic logistics support.

Business architecture in support of an integrated logistics enterprise will impact and effect change in associated business processes, strategy, organization, and even culture. Activities that have heretofore never considered the impact of their decisions on other DOD logistics activities are now required to do so. Some of the benefits that are expected from the integrated readiness environment include:

- Reduced order cycle times;
- Eliminated business process redundancies and streamlined organizations;
- Reduced inventory levels and material requirements, and;
- Increased visibility over materiel flows and production processes.

Implementation of the integrated environment will transform logistics business processes end-to-end, resulting in and substantial performance improvements. Data and information exist as an enterprise asset, where they are continually updated to ensure that information is always authoritative, available, and up-to-date. In addition to integrated, real-time information to support the warfighter, authoritative sources of enterprise information permit the generation of metrics, such as those listed below that help gauge and improve the overall performance of the Logistics Enterprise.

OBJECTIVE	METRIC	MEASURE
Speed	Timeliness	Customer Wait Time (CWT)
Efficiency	Maximize correct requisition fills Minimize incorrect requisition fills	Requisition Fill Rate Utilization rates
Effectiveness	Minimize repair down time	Repair time
Flexibility	Maximize Weapons System Availability	Operational Availability (A_o)
Economy	Minimize Cost	Item Total Cost Cost per Transaction Cost per Seat Logistics IT System Count

Table 2-1: Logistics Process Metrics

Modern COTS software will enable the Department to implement the best processes that allow collaborative support of operational forces. This software will meet unique DoD architectural requirements such as the C4ISR Architecture Framework that requires the technical view of the architecture comply with the standards adopted through DoD’s Joint Technical Architecture (JTA). Modern COTS applications are designed to operate on standard commercial platforms and interoperate using the commercial standards (i.e., ISO, ANSI, and Industry standards) that form the core of the JTA. Finally, modern COTS software can provide certification of

compliance with the Defense Information Infrastructure Common Operating Environment (DII-COE) at appropriate levels to insure interoperability.

Creating an integrated environment across the DoD logistics enterprise will also include aspects of collaboration, standardization, and integration to ensure that the information and value chains support the overall DoD enterprise (including Acquisition, Comptroller, etc.) at the optimum levels (Figure 2-3). This will include improved reporting, both internally and externally, of key metrics, through the implementation of consistent business rules and requirements across the enterprise. Higher levels of integration are possible because timely, accurate and actionable information about the Logistics Enterprise is available in a consistent manner.

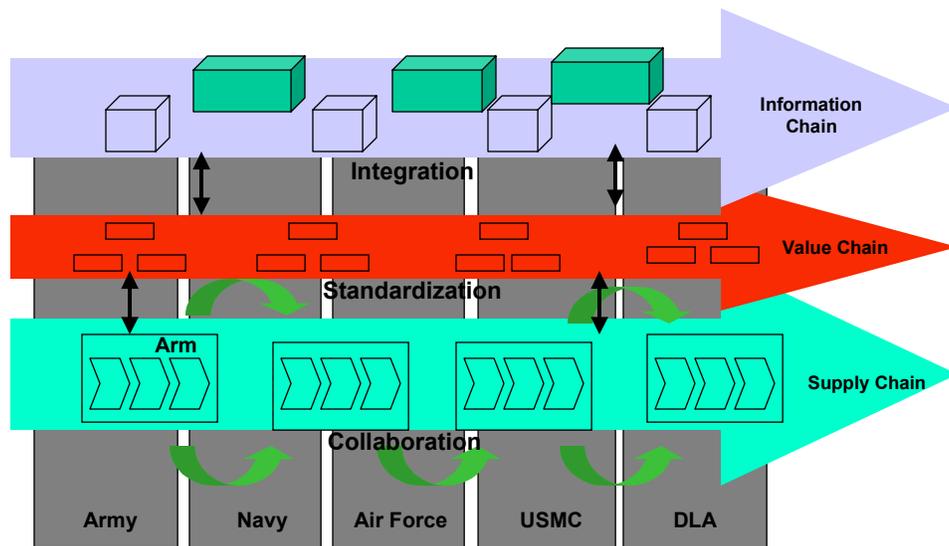


Figure 2-3: An Integrated Environment Fosters, Collaboration, Standardization, and Integration of Processes and Information

Available advanced information technology can accelerate our ability to realize the logistics enterprise vision. We can use information to reduce Customer Wait Time in the logistics supply chain and therefore increase the operational availability of weapons systems. We can also reduce the total inventory we maintain and the “footprint” we deploy to forward operating locations. Ultimately, use of business architecture will significantly improve Logistics ability to provide the warfighter with the right supplies and equipment, in the correct condition, place, and time with speed, efficiency and economy.

Section III – The Systems Architecture to enable the Business Architecture

The description of the systems and interconnections supporting the required enterprise functionality is generally referred to as the Systems Architecture. This section describes the Systems Architecture required to meet the specific needs of the DoD logistics enterprise.

The Systems Architecture has been designed to meet the Logistics objectives described in Section II. The metrics associated with each of these objectives provide a mechanism to measure the effectiveness -- and hence the value -- of the systems architecture. This framework links enterprise partners as they accomplish specific tasks within the DOD logistics enterprise. It provides access to information through a shared data environment designed to support all manner of interactions including modern electronic commerce. Partners will be connected to each other to support all necessary business interactions. Where interaction is required *within* the logistics community or within *other* domains, the systems architecture provides the services required to support the enterprise. These services include, for example, the ability to discover enterprise resources, make queries regarding the status of these resources, and complete the business processes required by the DoD logistics mission.

E-business is inherent in the architecture. The onset of new software capable of exploiting the potential of the Internet has helped large disperse organizations implement sophisticated Supply Chain Management and other advanced systems to help optimize end-to-end operations. This connects “value chain” partners, even though each may have their own diverse technology solutions, resulting in a complex *extra enterprise—extraprise--* information environment.

ERP systems alone generate huge volumes of data. E-business expands and adds an important external focus to corporate data sources. The DoD enterprise can maximize value performance by leveraging all its information assets, whether drawn from ERP, CRM, SCM, other internal applications, or from external sources via the Internet. To do so, they need to establish processes and systems that can support the information needs of decision makers working across the extraprise in highly dynamic conditions.

The ability to share information and connect with geographically separated users to accomplish work enables the vision shown in Figure 3-1. Enterprise Integration provides knowledge management -- the functionality we need to realize the vision -- rapidly and affordably.

Collaboration within the enterprise as well as collaboration between DoD enterprises and with business partners outside the DoD enterprise is an essential requirement of the systems architecture. This collaboration must be easily accomplished while insuring the appropriate respective security and privacy rules remain inviolate. Access to information across the enterprise is an essential part of the collaborative process. The architecture must facilitate collaboration, provide ready, controlled access to information and it must enable the enterprise members to complete the myriad processes required to actually do the *work* of the enterprise.

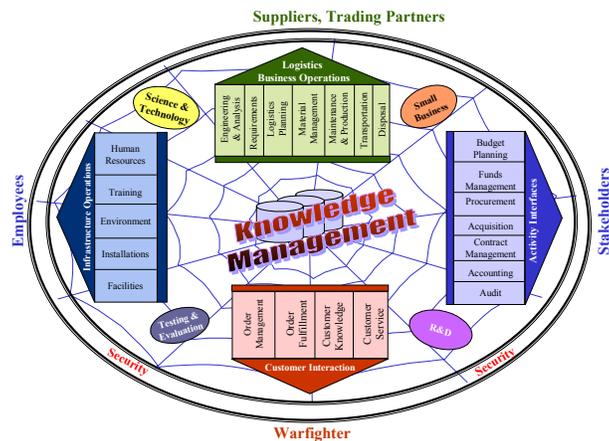


Figure 3- 1

At its highest level, Logistics Enterprise Integration is based on a “three tier architecture” where data and applications are separate and user interface is provides through a very thin client. Users access the enterprise through tailored enterprise specific portals via Internet connection. Within the enterprise, various specific applications/application modules are connected through an Application Programming Interface (API) sitting atop a services layer providing such services as Security, Workflow, and the communication protocols. In the diagram at right, Figure 3-1, we aggregate all these services and the basic enterprise modules into the “core enterprise” and “communications” blocks. These largely COTS packages form the heart of the enterprise architecture portfolio. The core enterprise enables the basic processes supporting each part of the enterprise. These basic processes include project management, distribution, transportation, supply, maintenance, administration, finance, human resources, and others. The open API allows each part of the enterprise access to the core to add enterprise specific applications in an architecturally consistent manner. Once new applications are included in the portfolio, they are available enterprise-wide and are managed as a part of the portfolio.

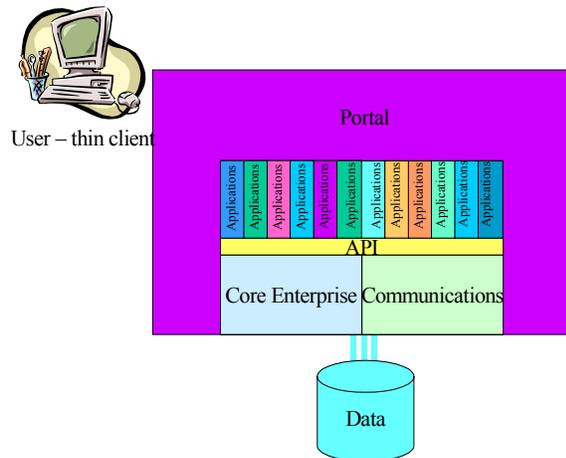


Figure 3- 2

Figure 3-2 describes the top-level systems architecture enabling the business processes included in the DoD logistics enterprise. Conceptually, this architecture separates the Logistics enterprise into representative sub-enterprises. Architecturally, there are as many or as few of these sub enterprises as the mission requires; the drawing could be amended to include a TRANSCOM enterprise or a USMC enterprise, for example.

enterprise. Note that interfaces to other domains occur through this node as well. The logistics enterprise will interface to other DoD domains to provide full access to logistics information and to provide access to other resources to accomplish the logistics mission. Where the Comptroller requires specific accounting information and formats, for example, we will establish required interfaces through this business intelligence node. In this manner, all logistics information can be made available to meet the legitimate requirements of any other collaborant in the DoD enterprise.

Supply chain management is beginning to tap into the power of online marketplaces to create supply chain exchanges, or “private exchanges”, that support *collaborative commerce communities*. A supply chain exchange uses an e-marketplace infrastructure to link an enterprise and its supply chain partners into a network. Unlike a public e-marketplace or exchange, the supply chain exchange is designed to be owned, operated, and managed by an enterprise, which brings its suppliers, partners, and customers into a managed environment that protects confidential data and guarantees that information is shared among partners. A supply chain exchange can provide supply chain partners a way to collaborate on design, procurement, demand and supply management, and a host of other supply chain activities.

With an effective collaboration environment in place, organizations can expect improvements across a range of activities. Synchronization of execution and logistical efforts is improved – meaning less downtime for assets. Enterprise partners can work with common forecasts. Planning and optimization are more efficient, and information-sharing friction is reduced internally and externally.

The Logistics Enterprise architectural construct supports the “delivery strategies” discussed in Section IV. The architecture is based on incremental development and evolutionary management of the portfolio. *The architecture is vendor neutral*. The implementation will be primarily COTS based where components are qualified and maintained within the evolving portfolio providing the best possible functionality consistent with a configuration-controlled architectural framework. This approach will provide the required scalability and interoperability while helping to deliver the optimal return on investment.

Section IV – The Strategy to Deliver the Architecture

This section describes the “planks” of the logistics strategy to successfully achieve the vision. These planks form the foundation on which we enable a truly effective integrated Logistics Enterprise.

Comprehensive Governance and Oversight. The stakeholders of the Logistics Enterprise must collaborate to realize the vision. This will be facilitated through the Joint Logistics Board (JLB) and the Defense Logistics Enterprise Board (DLEB) and the associated working groups. DUSD(L&MR) will establish three groups as shown in Figure 4-1 below that facilitate collaboration and assist in oversight. Each group will maintain specific focus in order to accelerate delivery of the architecture.

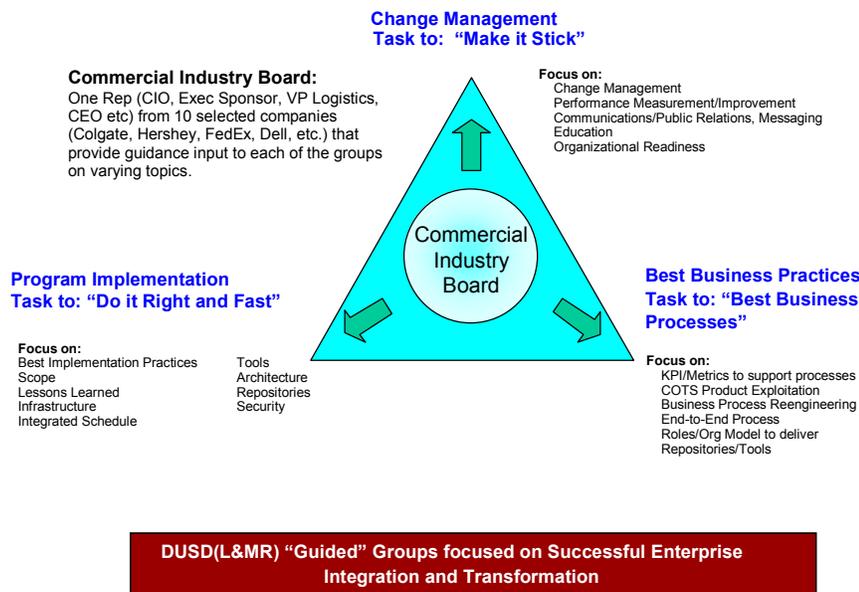


Figure 4-1

The managers implementing the architectural components focus on delivering the “right” product as quickly as practical. The business process owners focus on developing the best possible business practices and metrics. The executive sponsors focus on “change management” and making decisions “stick.” This structure is designed to encourage and facilitate collaboration between DoD enterprise integration efforts to ensure all parts of the DoD enterprise contribute to the vision.

Portfolio Management. We will manage the delivery of the Logistics Enterprise Integration architecture through a focused rationalized portfolio. This requires that every investment the Department makes must be “mapped” to the architecture to ensure that it contributes to realizing the vision. Investments must add functionality to the enterprise in an *architecturally consistent* manner. This will ensure we realize the full functionality of the architecture as efficiently as possible (consistent with the “80/20 rule below).

Best People. A collection of the “usual suspects” will not produce the revolutionary results required to achieve the vision; the “garbage in/garbage out” maxim applies. Logistics Enterprise Integration and Transformation cannot succeed without the application of proper resources. Managers within the government as well as the industry partners must find and use the best people to achieve the vision. Enterprise managers will establish measurable success criteria and provide incentives so team members deliver according to plan! Managers will establish clear consequences for non-performance.

Accountability. All members of the enterprise must be held accountable to delivering their products in accordance with approved enterprise plans. Individual program managers must be provided with the resources and the authority to execute approved plans, and must develop criteria to measure progress against these plans. Managers will establish clear consequences when planned deliverables are not available.

Return on Investment. Throughout the planning and execution phases, the *value* added from every increment of investment must be predicted, measured, and managed. Enterprise managers will establish Key Performance Indicators (KPI) for each increment, and will determine the return on every investment. Specific metrics will be tailored to specific implementations but can be expected to include these examples:

1. Increase efficiencies by integrating customers and suppliers in the extended supply chain.
2. Reduce inventory levels via real time visibility to inventory.
3. Break down functional silos to drive consistent information and process flows.
4. Increase asset utilization.
5. Decrease asset life cycle cost.
6. Quickly integrate acquisitions into supply chain operations.
7. Reduce supplier and maintenance costs through improved planning.
8. Optimize supply chain planning and execution across enterprise boundaries, and share the resulting higher value with partners.
9. Cut order cycle times - increase responsiveness.
10. Move from supply-centric to customer-centric demand chain in which actual customer demand drives production and replenishment

Financial Focus. Attaining the vision in the quickest time will require significant investment of precious resources. Investments must be focused on clear objectives to avoid diluting/delaying the ability to attain the vision. All investments will be evaluated in the context of their contribution towards this vision. We cannot afford “hobby shops.” OSD must ensure that we spend these resources on activities that add real value to the enterprise and contribute to the vision. Funded ADUSD(L&MR) LSM actions, for example, are designed to contribute directly to accelerating realization of the Logistics Enterprise Integration vision. Moreover, DUSD(L&MR) is leveraging our investment dollars in programs like the Defense Information Infrastructure (DII) to accelerate attaining our vision. Service investments must support the architectural baseline and be focused on achieving the vision.

The “80/20 Rule.” We get the most value from the first 80% of our effort. The Department cannot afford to “chase” requirements that add a small margin of utility to the system. This must

be a guiding principle as the community implements each part of the architecture. Managers will aggressively manage the requirements process to develop stable, clear sets of requirements for each portion of the architecture. The Enterprise Integration and Transformation team will strive to deliver the “80% solution” as expeditiously as possible.

Phased Implementation. A phased implementation strategy based on *measured* success will be developed. Legacy systems must be decommissioned as rapidly as practical. A “big bang” strategy to implement the vision cannot succeed. DUSD(L&MR) will develop an integrated timeline that will serve as the roadmap for implementing the architecture. The return on each incremental investment must be predicted and measured to insure the Department realizes the value required.

Minimize COTS Software Modification. Any changes to the commercial software must be carefully considered and approved at the enterprise level. The “80/20 Rule” applies. This plank is crucial if we are to maintain interoperability and configuration management across the enterprise. The Department will develop processes that allow it to leverage commercial development costs. Managers must implement an “executive approval process” based on portfolio management principles in order to realize standards across the portfolio.

Evolution Based Acquisition. Each component of the portfolio will continue to evolve new functionality and efficiency over time; we will leverage this evolution throughout the enterprise. In conjunction with our phased implementation strategy the community will evolve the portfolio consistent with the functional evolution of the individual components. The core COTS software in the portfolio must be scalable to support a growing number of users and a growing set of functionality as specific features/process are implemented.

Capable Infrastructure. The Logistics enterprise must be supported by a reliable, available, and scalable infrastructure providing the bandwidth, security, and availability appropriate the support the vision. Managers must establish clear requirements for the enterprise infrastructure and ensure they are provided for.

Section V – Schedule and Action Plan

Between now and 2004, the Department of Defense will make significant progress in achieving the vision described in this paper.

The “Discovery” review of the on-going EI programs within the Services and Agencies was initiated in October, 2001. This cooperative review of the Service/Agency sponsored Enterprise Resource Planning projects will ensure the emerging systems architecture is aligned with ongoing efforts. DUSD(L&MR) will institute an architectural based governance system for the programs contributing to the architecture.

The initial program reviews will be complete in December 2001. DUSD(L&MR) will make investment and program management recommendations/decisions based in part on these reviews. Subsequently, the guided groups discussed in Section 4 will assist in developing the detailed implementation plan for the next three years.

Initial Milestones are shown in figure 5-1 below.

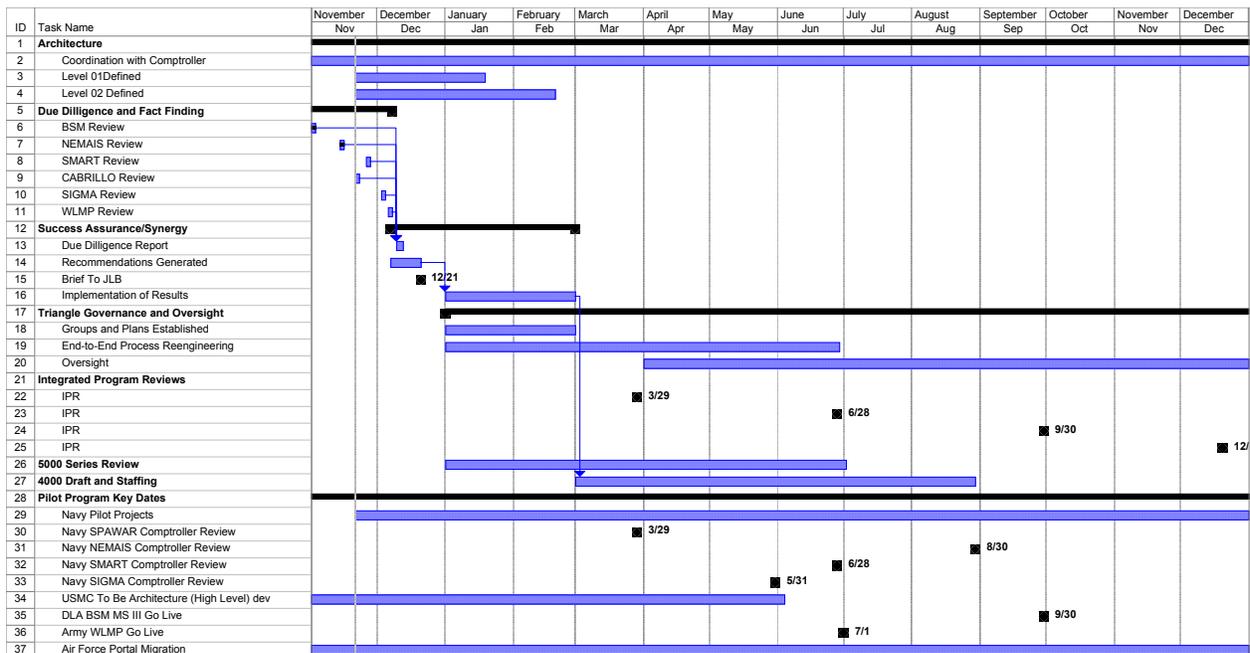


Figure 5-1

The Enterprise Integration and Transformation Implementation plan accelerates implementation over the next three years.