



# DEPARTMENT OF THE NAVY (DON) DATA MANAGEMENT AND INTEROPERABILITY (DMI) STRATEGIC PLAN

Department of the Navy  
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IATAC  
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Falls Church VA 22042

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The overall purpose of this plan is to guide the evolution to a data services environment that supports mission requirements for both the warfighting and business segments of the Department of the Navy mission through improved decision making support, enhanced operational capabilities, and optimized data management. It's intended audience is the community of IT stakeholders in the DON.

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CHIEF INFORMATION OFFICER  
1000 NAVY PENTAGON  
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MEMORANDUM FOR DISTRIBUTION

Subj: DATA MANAGEMENT & INTEROPERABILITY STRATEGIC PLAN

The Department of the Navy leadership recognizes the importance of a robust information technology infrastructure in achieving information and knowledge superiority goals. Information Technology for the 21<sup>st</sup> Century (IT-21) and the Navy Marine Corps Intranet (NMCI) are strategic infrastructure initiatives that will result in improved capability to collect, process, and disseminate information. Joint Vision 2020 recognizes that the "information revolution" is creating both quantitative and qualitative change in the information environment. In order to maximize the benefits of a robust infrastructure, it is essential to organize our information assets to ensure that the right information is available at the right place, at the right time, and in a format that meets user requirements.

Effective and efficient data management practices are the foundation for information management, knowledge management, and decision support. The DON CIO Board of Representatives recognized the need for a comprehensive plan to organize and manage data and chartered the DON Data Management & Interoperability Integrated Product Team (DMI IPT) in October of 1999. Over the past year, the DMI IPT, composed of over 40 representatives from 27 Navy and Marine Corps Commands, has worked to develop the processes required to support the development of integrated data architectures. The DMI Strategic Plan recognizes data as an enterprise resource and provides the high-level roadmap for organizing this resource in ways that will support its integration and exchange.

The Navy and Marine Corps can achieve the goals outlined in this Plan with leadership and commitment. A unified data management and engineering infrastructure that supports IT systems development and reengineering is essential to achieving maritime information superiority. I encourage all DON organizations to factor these goals and objectives into their planning strategies.

A handwritten signature in black ink, appearing to read "D. E. Porter".

D. E. Porter



# FOREWORD

At 0215 on 23 September 1999, the National Aeronautics and Space Administration's Mars Climate Orbiter was lost, reportedly because of conflicting units of measure used to control the vehicle's rockets. This data error set a major National program back over \$125M and an undetermined number of years. While this is one of the more visible examples, data is implicated in many other operational mishaps. A key objective of the DON Data Management and Interoperability (DMI) Strategic Plan is to provide the foundation for processes which reduce the probability of such events.

The overall purpose of this plan is to guide the evolution to a data services environment that supports mission requirements for both the warfighting and business segments of the DON mission through improved decision making support, enhanced operational capabilities, and optimized data management. Its intended audience is the community of IT stakeholders in the DON.

Documentation of the DMI strategy is intended to define a common ground so that the IT stakeholders can come together to devise acceptable processes, procedures and other prescriptive actions. In the process of producing the plan, a number of DOD and DON sources were screened to assure compliance and identify the most productive startup projects. From those sources we have selected five DON DMI goals that represent quick, high-payoff efforts that will lay the foundation for future projects. The goals describe areas for change. Each goal statement is followed by a description to outline the context for the goal. Subsequent objectives and strategies characterize actions needed to pursue each goal. High level metrics for executing the plan are included. Other areas will be addressed in updates to the plan.

A key start up effort is the identification and refocusing of existing initiatives. As recently indicated by the ASD (C3I), a review of ongoing efforts is necessary to avoid inadvertent duplication or conflicts and to achieve common objectives, including data interoperability. This plan emphasizes that policy is a necessary first step in resolving a long-standing systemic problem. It is being used by a DON DMI Integrated Product Team as the foundation for developing DON DMI Implementation Planning Guidance for use by Navy and Marine Corps Data Administrators, Functional Data Managers, and System Developers.



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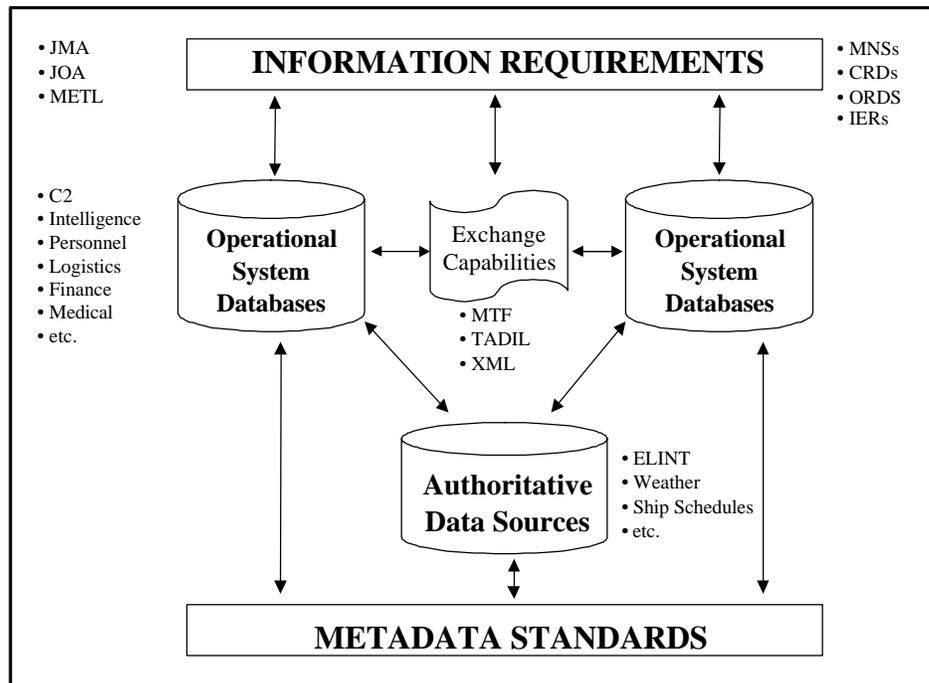
# 1. INTRODUCTION

The DON CIO is responsible for developing and publishing the enterprise-level view of Data Management and Interoperability (DMI) and developing appropriate policy and guidance. Data Management for the purpose of this plan adds the executive dimension to the data administration functions defined in DOD Directive 8320.1; i.e., the definition, use, and protection of data. An interoperability focus assures that the data management infrastructure and functions are better linked to current and future force structures and operational requirements.

This plan identifies strategic DMI goals and related performance measures. Subsequent plans and initiatives for DMI must be consistent with, and complementary to, these strategic goals. The SECNAVINST for DON Data Management and Interoperability (currently in staffing) outlines roles and responsibilities for selected individuals/organizations. Success of DMI and achievement of network centric operations and information superiority goals require that the concepts outlined in this strategic plan be institutionalized in all DON organizations and functions.

## 1.1. Purpose and Scope

This plan addresses DMI as it applies to databases and data exchange within and across all systems, both warfighting and business. The strategic goals herein apply to all Navy and Marine Corps organizations including the operating forces and supporting establishment. Exhibit 1 shows DON DMI areas of focus.



**Exhibit 1. DON Data Management and Interoperability**

Satisfying information requirements is dependent on the ability of automated systems to exchange data effectively and efficiently. Metadata standards provide the foundation for data interoperability, and the use of Authoritative Data Sources (ADSs) for data help to ensure data consistency among diverse systems. The strategic goals address these focus areas and will enable the Department to improve

operational effectiveness and to reduce data costs. This will be accomplished by unifying efforts and developing supporting management and engineering processes. A DMI infrastructure will be established by leveraging ongoing efforts and strategic initiatives such as Commercial Business Practices Enterprise Resource Planning (ERP) pilot projects and Navy/Marine Corps Intranet (NMCI).

The overall intent of DON DMI is to:

- Support DON operations and decision making processes with data that meets their specific needs to expedite and improve results,
- Structure data in ways that enable horizontal integration and sharing of data within the DON, and with other U.S and allied government organizations,
- Provide the basis for data integrity and assurance measures to ensure its reliability and to effectively enable and control access,
- Embody a complete data life-cycle process from operational requirement through meeting day-to-day data needs, including a configuration management methodology that is responsive to data developers, producers and users, and to
- Maintain a data infrastructure that will enable data developers, producers, and users to concentrate on their core missions rather than on reinventing and questioning data.

## 1.2. Governing Directives

There are multiple directives and other governing documents that affect DMI. The principal documents are identified below.

- a. SECNAVINST for DON Data Management and Interoperability (currently in staffing), provides policy and identifies responsibilities for data management across the Department of the Navy.
- b. Government Performance and Results Act (GPRA) of 1993 requires the establishment of strategic planning and performance measurement in the Federal Government. OMB has mandated that strategic plans cover six-years and be updated every three years.
- c. Title 40, United States Code, Chapter 25, as amended codifies Public Law 104-106, “National Defense Authorization Act for FY 1996,” Division E (Clinger-Cohen Act). It establishes Chief Information Officer (CIO) responsibilities for Information Technology (IT) and mandates improvement in day-to-day mission processes and proper use of IT (includes National Security Systems) to support those improvements.
- d. Title 10, United States Code, Chapter 131, Section 2223 codifies Public Law 105-261, “National Defense Authorization Act for FY 1999” Section 331. It states the Chief Information Officer of a military department, with respect to the military department concerned, shall: (1) review budget requests for all information technology and national security systems; (2) ensure that information technology and national security systems are in compliance with standards of the Government and the Department of Defense; (3) ensure that information technology and national security systems are interoperable with other relevant information technology and national security systems of the Government and the Department of Defense; and (4) coordinate with the Joint Staff with respect to information technology and national security systems.

- e. FY 2001, Defense Appropriations Act, Section 8102 states that none of the funds appropriated in this Act may be used for a mission critical or mission essential information technology system (including a system funded by the defense working capital fund) that is not registered with the Chief Information Officer of the Department of Defense. A major automated information system may not receive Milestone I approval, Milestone II approval, or Milestone III approval within the Department of Defense until the Chief Information Officer certifies, with respect to that milestone, that the system is being developed in accordance with the Clinger-Cohen Act of 1996. The Chief Information Officer may require additional certifications, as appropriate, with respect to any such system. Reporting is in the form of a database and the reporting structure of the information will need to enable sharing of registration data in the DOD.
- f. DOD Directive 4630.5 of 12 Nov 92, “Compatibility, Interoperability, and Integration of Command, Control, Communications, and Intelligence (C3I) Systems” requires interoperability between C3I and interfacing systems. DOD Directive 4630.5 under revision “Information Interoperability and Supportability” implements Clinger-Cohen Act and directs an outcome-based approach to ensure interoperability of Information Technology and National Security Systems (NSS) throughout the DOD. It establishes that requirements for information interoperability be characterized in a family of systems or system of systems joint mission area context for all IT and NSS capabilities.
- g. DOD Directive 8320.1 of 26 Sep 91, “DOD Data Administration” requires that DOD data management be implemented to support operations and decision making with data that meets the need in terms of availability, accuracy, timeliness and quality. It also cites the need to structure the information to enable horizontal, as well as vertical, sharing of data in the DOD.
- h. DOD 8320.1-M-1 of Apr 1998, “Data Standardization Procedures” prescribes procedures for the development, approval, and maintenance of DOD data standards necessary to support the policies of DOD Data Administration as established by DOD Directive 8320.1.
- i. Defense Information Infrastructure (DII) Common Operating Environment (COE) Integration and Runtime Specification (I&RTS), Version 4.0 of 25 Oct 1999 describes the technical requirements for using the Defense Information Infrastructure (DII) Common Operating Environment (COE) to build and integrate systems. It specifies levels of DII compliance that are tied to levels of interoperability for applications, and database segments which are being developed as part of the Shared Data Engineering (SHADE) effort.
- j. DON Information Technology Standards Guidance (ITSG), Version 99-1 of 5 Apr 1999 provides DON information management guidance for information requirements definition, information interchange, database management and interoperability, and data metrics.
- k. Joint Vision 2020, the capstone joint warfighting strategic plan, recognizes information superiority as the foundation for new joint doctrine and concepts. It defines information superiority in terms of continuing emphasis on interoperability as a critical enabler for harvesting the benefits of the ongoing Revolutions in Military and Business Affairs.
- l. CJCSI 6212.01B of 8 May 2000, Interoperability and Supportability of National Security Systems, and Information Technology Systems, establishes policies and procedures for the J-6 interoperability requirements certification of mission need statements (MNSs), Capstone Requirements Documents (CRDs), and operational requirements documents (ORDs). It also details a methodology to develop interoperability key performance parameters (KPPs) derived

from a set of top-level information exchange requirements (IERs) based on the format and content of the integrated architecture products described in the C4ISR Architecture Framework.

### 1.3. Background

DON systems are often narrowly focused, not fully interoperable, and support a single function or organization. Users are often required to assemble information from incompatible and sometimes conflicting data sources.

Current and developing guidance now recognize that common data standards are essential to interoperability. In the process, data standards issues have proven as complex as those associated with hardware and software, because they reflect diverse functional cultures and regional operational practices. As the DON evolves to global network operations, there is a need to effectively address these issues to achieve interoperability and horizontal integration.

As a first step, systems databases and interfaces need to be inventoried, and their associated metadata need to be recorded in a standard or consistent format, and stored in a repository for ready access by DON system developers and users. This systems documentation will provide the common baseline from which to identify data inconsistencies and data redundancies between systems. It will provide the data management basis for near term interoperability reengineering, as needed, to support a DON Revolution in Military Affairs (RMA) and a Revolution in Business Affairs (RBA).

#### 1.3.1. Data Administration

The DOD Data Administration program is evolving. In 1998, the DOD Data Administration Council conducted an evaluation of the process as outlined in DOD 8320.1-M-1. Exhibit 2, DOD Data Administration Lessons Learned, shows the areas which were identified as needing improvement in order of importance.

| Ballot Item                                    |
|--|
| Senior Management commitment                   |
| Funding  |
| Metrics/ Performance Measures                  |
| Implementation Policy                          |
| Strategies                                     |
| Architecture/Framework                         |
| Cross-Functional Shared Projects               |
| Map and Link to Operational Systems            |
| Cultural Change                                |
| Work with Industry Standards Development Orgs. |
| Technology Insertion                           |

**Exhibit 2. DOD Data Administration Lessons Learned**

The overall conclusion is that the major DOD data problems are management problems, not technical. This has led to recognition of a need to redefine data administration concepts to include data management and engineering processes and procedures. Data management adds executive dimensions to the continuing data administration functions; data engineering provides realism and visibility. This is essential to achieve necessary change in the way data is managed across the department. An interoperability focus assures that the data management infrastructure and functions are better linked to current and future force structures and operational requirements.

### 1.3.2. Systems Interoperability at the Data Level

The lack of interoperability between databases is a long-standing systemic problem that has precluded realizing the full potential of IT systems and investments. Database synchronization remains marginal across the global network because the data elements in databases are frequently different and do not interoperate. This precludes use of networked databases to help control the information explosion.

Ironically, while hardware and software standards have played a major role in achieving basic interoperability, there has been less success in implementing data standards. Even as database management programs and hardware advance in step with the rest of information technology, achieving systems interoperability at the data level has been very difficult. Earlier reasons include a lack of suitable standardization technologies and methodologies, lack of a pragmatic process, few qualified technical personnel, and fewer still high-level managers confronting the issue. These problems are addressed in the DON DMI effort.

CJCSI 6212.01A states that, “Standards are the foundation for interoperability; their availability, use, and enforcement are the basis for achieving the ultimate goal of a seamless environment.” The DON will apply this policy to data as key DMI management and performance improvement criteria. This plan addresses the data issue directly in support of DOD and JCS directives and initiatives. The goal is to achieve domain and enterprise level interoperability as shown in Exhibit 3.

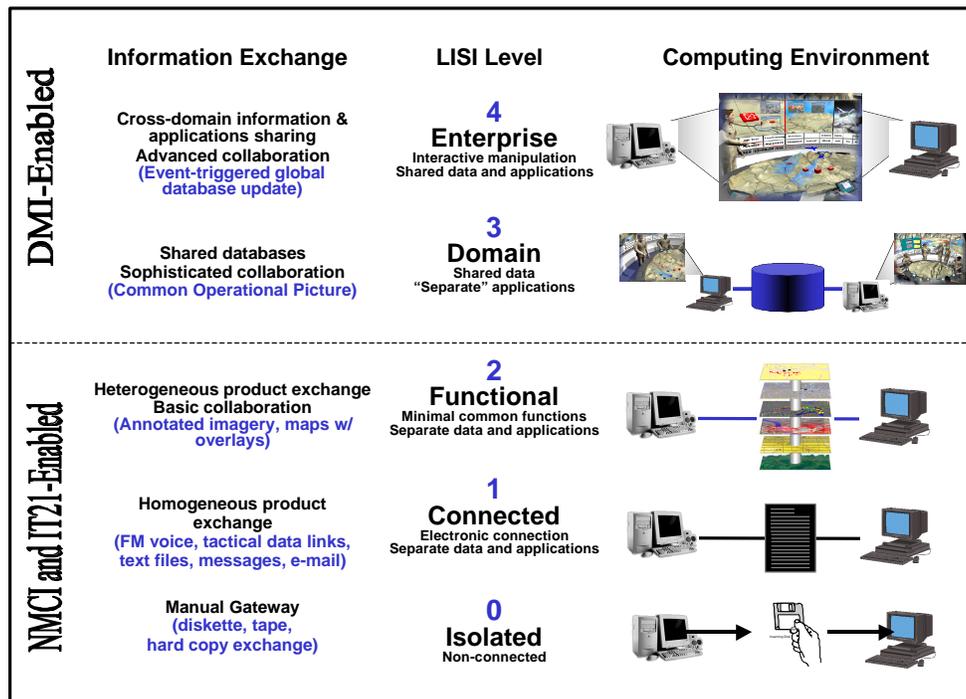


Exhibit 3. Levels of Information Systems Interoperability (LISI)

## 1.4. Mission, Vision, and Concept of Operations

The DON vision and mission are derived from the DON IM&IT Strategic Plan and the DOD Data Management Strategic Planning Guidance. Section 2 describes these documents.

### 1.4.1. DON DMI Mission

Data Management is an essential IM and IT building block. Exhibit 4, the DON DMI Mission, shows that it is fundamental to information management and knowledge management. Effective decision support depends on the integrity and reliability of the information and knowledge base, which rests on sound data, reinforced by standards for data which are based upon operational and technical requirements. It is also integral to systems interoperability and information assurance.

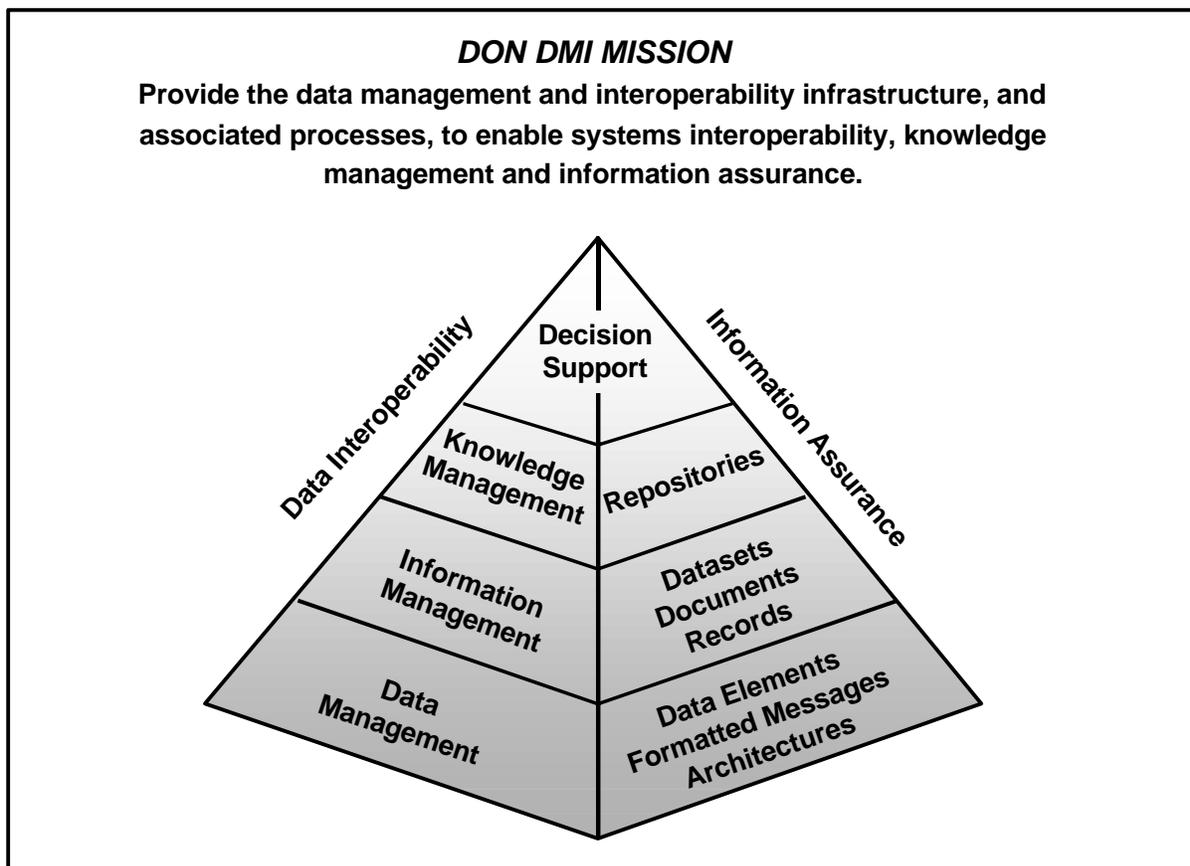
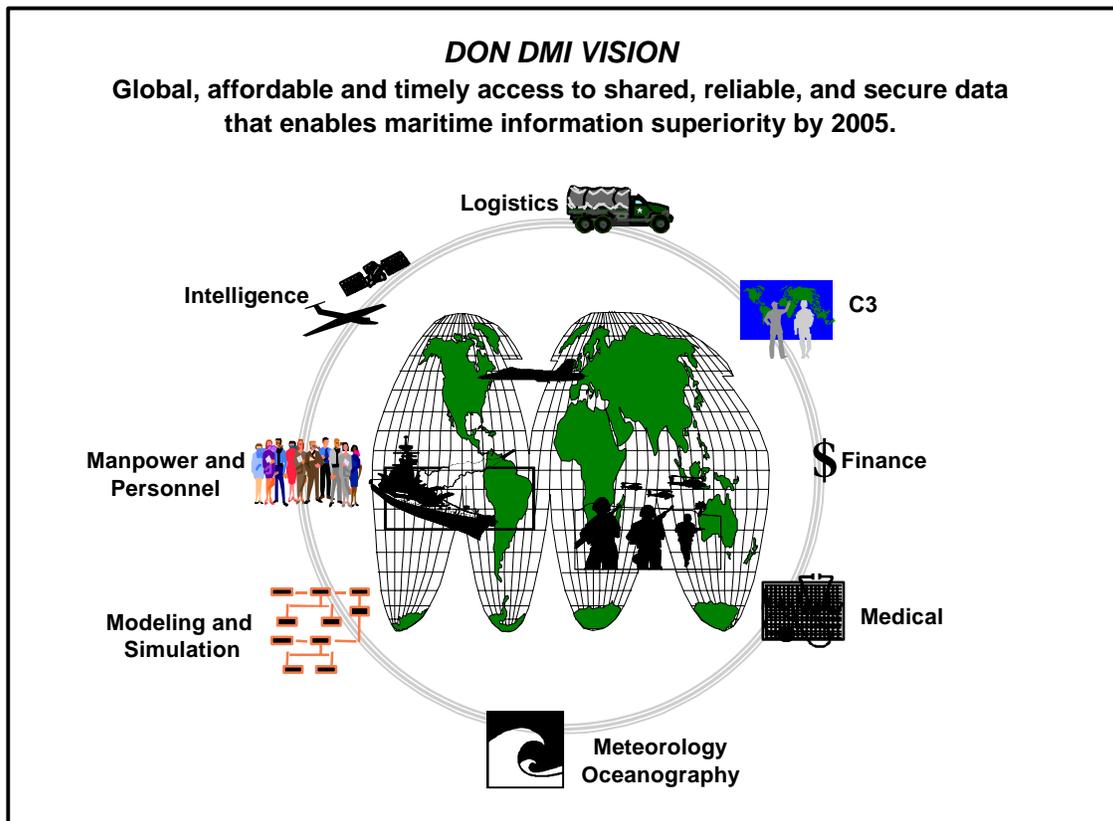


Exhibit 4. The DON DMI Mission

## 1.4.2. DON DMI Vision

Exhibit 5 depicts the DON DMI vision. If the DON is to realize the full potential of its IT21 and NMCI investments to support network centric warfare, the data must be interoperable. JV2010 assumes information superiority. JV2020 places additional emphases on interoperability and decision support. They describe emerging operational concepts for dominant maneuver, precision engagement, focused logistics, and full dimensional protection. These concepts will have to be defined in terms of information requirements. That means having well defined definitions, semantics, syntax, and formats for database data elements. In this context, DMI becomes the basis for information interoperability across business and warfighting systems and functions and supports all IT and NSS initiatives.



**Exhibit 5. The DON DMI Vision**

While the vision and goals of DMI are important steps in defining the CONOPS, a number of guiding principles is needed to maintain focus. The following statements are consistent with the vision and goals:

- Data is created to meet specific information requirements that support specific missions and functions.
- Facts, as data, are entered one time, in one place, and are reused across the enterprise.
- Data element standards are used to the maximum extent possible.
- Data is managed as an enterprise asset.
- Data management efforts are coordinated across organizations and programs.
- Adequate resources are applied to data management and data architecture activities.
- Data structure and standards are a major consideration during systems acquisition and development.

### 1.4.3. DMI Concept of Operations (CONOPS)

As depicted in Exhibit 6, the DMI CONOPS, Don DMI has five distinct, yet interrelated, components. They are:

1. The Information Requirements component defines and documents Navy, Marine Corps, and Joint information requirements. They in turn provide focus in the POM for specific problems and/or specific operational capabilities.
2. The Systems Registration component includes establishment and maintenance of a system's data requirements baseline, i.e., legacy and new systems/applications database structures and data dictionaries, and systems transfer format implementations documented in a standard or consistent format to provide management visibility.
3. The IT, Interoperability, and IA Assessment Support component involves analysis of the systems metadata that is maintained in the DON DMI Repository.
4. The Data Architecture and Standards component includes construction and maintenance of DON data models, the designation of Authoritative Data Sources, and the DoD data element standards to support system development and interoperability.
5. The DMI Management component involves monitoring systems registration, addressing cross functional interoperability issues, and coordination of efforts to ensure maritime information superiority.

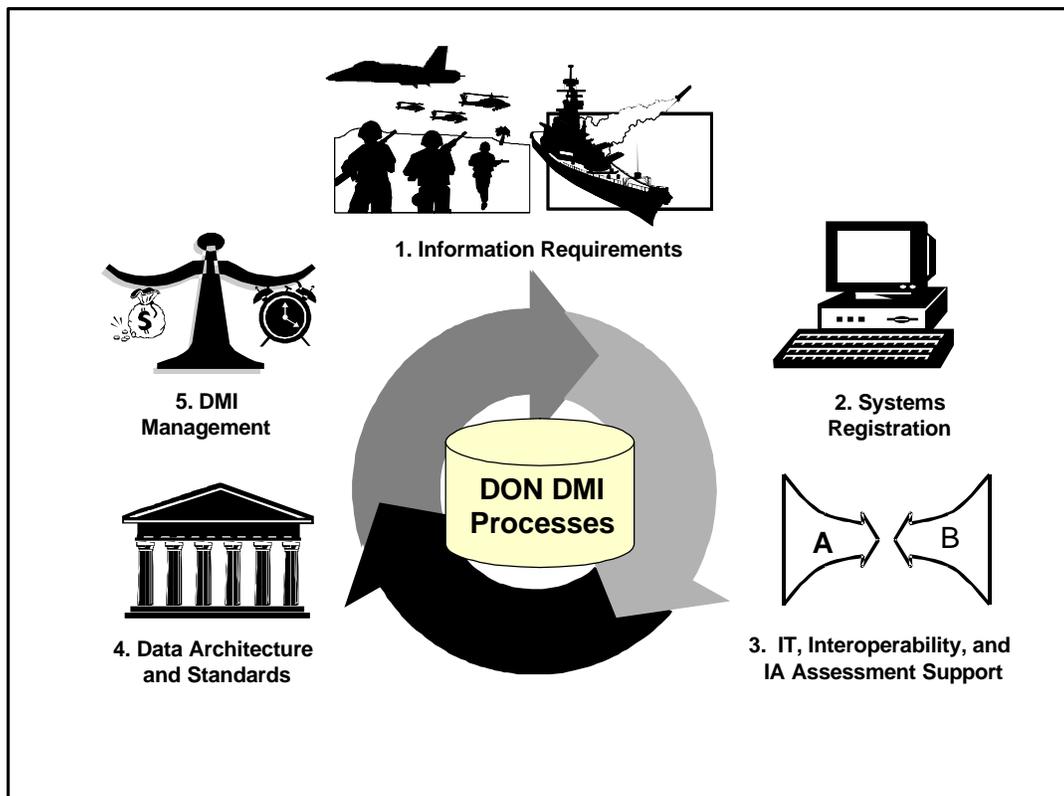


Exhibit 6. The DMI CONOPS

## 1.5. DMI Planning Environment

The DON IM&IT Strategic Plan and the DOD Data Management Strategic Planning Guidance provide top level goals and objectives that the DON DMI strategy must support. Exhibit 7, DMI Planning Framework, outlines the planning context in which the DON DMI Strategic Plan is evolving; the DON DMI Plan maintains vertical alignment with DOD and horizontal alignment within the DON.

DON DMI goals and objectives described in Section 3 are based on the DOD and DON goals and objectives that are described below. DON DMI goals and objectives should be used as the foundation for DMI investment planning in accordance with the DON Capital Planning Guide.

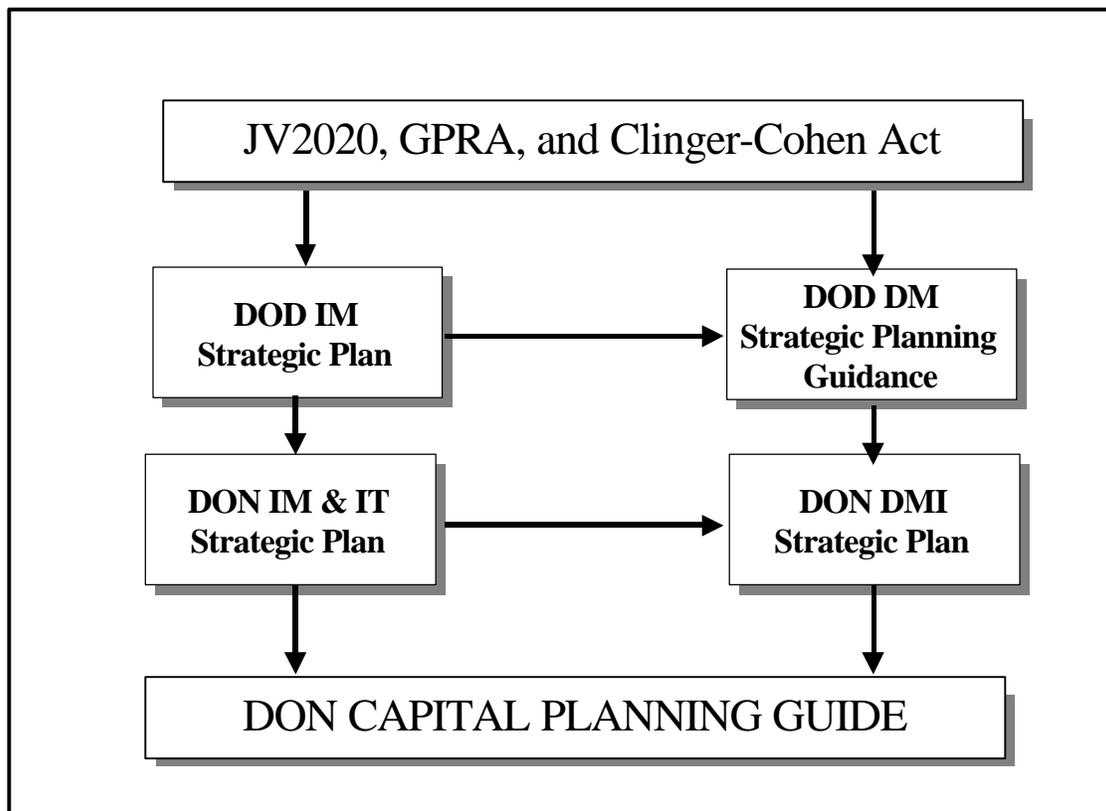


Exhibit 7. DMI Planning Framework

### 1.5.1. DOD Data Management Goals

DOD Data Management Strategic Planning Guidance (Draft) identifies the following goals. A complete listing of their respective objectives and strategies is in Appendix A.

- DOD Goal 1: Identify and document data requirements.
- DOD Goal 2: Establish an enterprise data infrastructure and supporting services.
- DOD Goal 3: Provide consistent and interoperable data services.

- DOD Goal 4: Assess and apply quality characteristics and conformance measures
- DOD Goal 5: Provide efficient policies and procedures, sufficient resources, and an effective organizational infrastructure.

### **1.5.2. DON Information Management and Information Technology Goals**

DON Information Management & Information Technology Strategic Plan FY 2000-2001 identifies nine goals as shown below. A complete listing of the objectives for the goals is in Appendix B.

- DON Goal 1 - Provide an information technology infrastructure that will ensure information superiority and connectivity throughout the Department of the Navy.
- DON Goal 2 - Reengineer warfighting and core business processes in parallel with technology infusion to maximize effectiveness and efficiency.
- DON Goal 3 - Maximize the value and manage the risk associated with DON information technology investments.
- DON Goal 4 - Implement strategies that facilitate the creation and sharing of knowledge to enable effective and agile decision-making.
- DON Goal 5 - Exploit emerging information technologies to achieve breakthrough performance.
- DON Goal 6 - Ensure the DON's information resources are secure and protected.
- DON Goal 7 - Resolve Y2K issues to ensure a smooth transition into the next millennium.
- DON Goal 8 - Build IM/IT competencies to shape the workforce of the future.
- DON Goal 9 - Foster and incentivize a technology-enabled information-rich culture

## 2. DON DMI GOALS, OBJECTIVES, AND STRATEGIES

The DON CIO is responsible for developing and publishing the enterprise view of data management and developing appropriate policy and guidance. This view reflects specific goals and performance measures to be achieved to improve the way data is managed DON-wide. These goals are consistent with and complementary to the goals and strategies contained in the current DON IM&IT Strategic Plan and DOD Data Management Strategic Planning Guidance (Draft) aimed at improved return on investments and Information Superiority. The following DON DMI goals are based on the DON IM&IT requirements and on the SECNAVINST for DMI policy and stakeholder inputs. The DON DMI Strategic Plan Compliance Matrix is shown in Exhibit 8.

| DON DMI Goals   | Applicable DON IM&IT Strategic Plan FY 2000 Objectives                | Applicable DOD DM Strategic Planning Guidance (09/99 Draft) Objectives and Strategies |
|---|---|---|
| 1. Provide a Data Management Interoperability Infrastructure that will Ensure Maritime Information Superiority  | Objectives 1.4, 2.2, 2.4, 3.4, 8.1, 9.1, 9.3, 9.5, 9.7                | Objective 5.1 – Strategies 5.1, 5.4   |
| 2. Reduce the Life Cycle Cost of Data Through Integration, Standards, and the Use of Authoritative Data Sources | Objectives 2.2, 3.2   | Objective 1.1 – Strategy 1.3<br>Objective 5.1 – Strategy 5.1                          |
| 3. Provide a DON DMI Repository and Tools to Support IT Assessments and Engineering                             | Objectives 1.4, 2.3, 2.5, 4.3, 4.5, 4.6, 5.2, 5.5, 6.1, 8.1, 9.4, 9.8 | Objective 2.1 – Strategies 2.1, 2.2<br>Objective 3.1 – Strategies 3.1, 3.3            |
| 4. Provide a Data Architecture which addresses both Information Requirements and Data Capabilities              | Objectives 1.4, 6.1, 7.6  | Objective 1.1 – Strategies 1.1, 1.2<br>Objective 3.1 – Strategy 3.2                   |
| 5. Provide Processes and Metrics to Enable and Evaluate Data Management and Data Engineering                    | Objectives 2.1, 2.2, 3.1, 3.2, 5.1                                    | Objective 4.1 – Strategies 4.1-4.3<br>Objective 5.1 – Strategy 5.1                    |

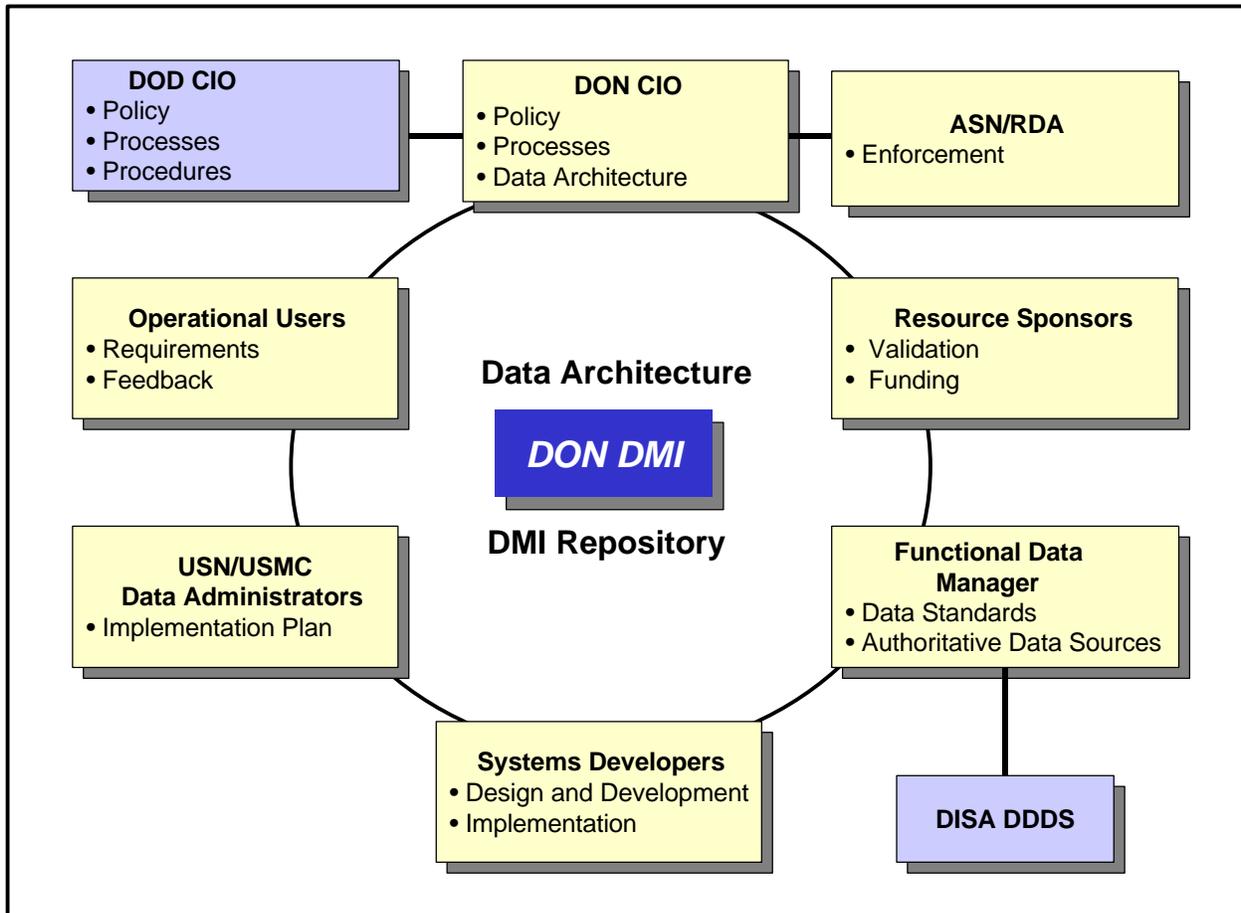
**Exhibit 8. DON DMI Strategic Plan Compliance Matrix**

The following pages list objectives and strategies necessary for the expeditious accomplishment of these goals. They also provide for a continuing effort to achieve and maintain a high level of data integrity and interoperability within and across systems.

**Goal 1 – Provide a Data Management and Interoperability Infrastructure That Will Ensure Maritime Information Superiority**

**Description:**

This goal includes bringing together diverse efforts through a defined data management and engineering infrastructure as represented in Exhibit 9. It includes planning and implementation that will leverage loosely coordinated efforts into a unified program that provides value far in excess of what independent projects can accomplish. This is responsive to Congressional and OSD mandates to achieve interoperability through measures that emphasize data standards. The SECNAVINST for DMI defines roles and responsibilities for achieving this goal. It calls for the designation of Functional Data Managers (FDMs) and Authoritative Data Sources (ADS). The initial focus will be on the following functional areas: Manpower and Personnel, Intelligence, Logistics, Command, Control and Communications, Finance, Medical, Meteorology and Oceanography, and Modeling and Simulation.



**Exhibit 9. DON Data Management and Engineering Infrastructure**

**OBJECTIVE 1-1: Achieve a DMI infrastructure by October 2001****Planning and Implementation Strategies**

- Issue Policy
  - Establish policies, assign responsibilities, and delegate authority for DMI
  - Designate Service Data Administrators
  - Designate Functional Data Managers (FDMs)
  - Designate an Executive Agent
  - Provide a DMI Repository
  - Provide a Data Architecture
- Incorporate DMI into the PPBS Process
  - Establish DMI Program Element
  - Fund DMI infrastructure
- Incorporate DMI into the Acquisition Process
  - Revise SECNAVINST 5000.2
  - Incorporate DMI into Operational Requirements Documents (ORD) using Mission Needs Statements (MNS) and Operational Architectures (OAs)
  - Issue System Certification (8121) Plan
  - Issue System Data Interoperability Compliance Testing Criteria
  - Issue standard database documentation template

**OBJECTIVE 1-2: Provide DMI education and training****Planning and Implementation Strategies**

- Identify core capabilities and user training needs
- Implement and sustain capabilities and training

**OBJECTIVE 1-3: Develop and implement an outreach strategy****Planning and Implementation Strategies**

- Focus ongoing efforts to ensure effective and efficient data sharing within the DON, with other services and DOD agencies, and with allied services
  - Establish methodology for monitoring initiatives in industry, DOD, and allied services
  - Establish methodology for capitalizing on external initiatives best practices
  - Develop incentives for cooperative efforts between industry, DOD, and Allied Services

**Products:**

SECNAVINST, DMI Strategic Plan, Navy/Marine Corps Implementing Instruction, Navy/Marine Corps Implementation Plan, DMI Education and Training Plan, DMI Outreach Plan, System Certification (8121) Plan, Database Documentation/Registration Template

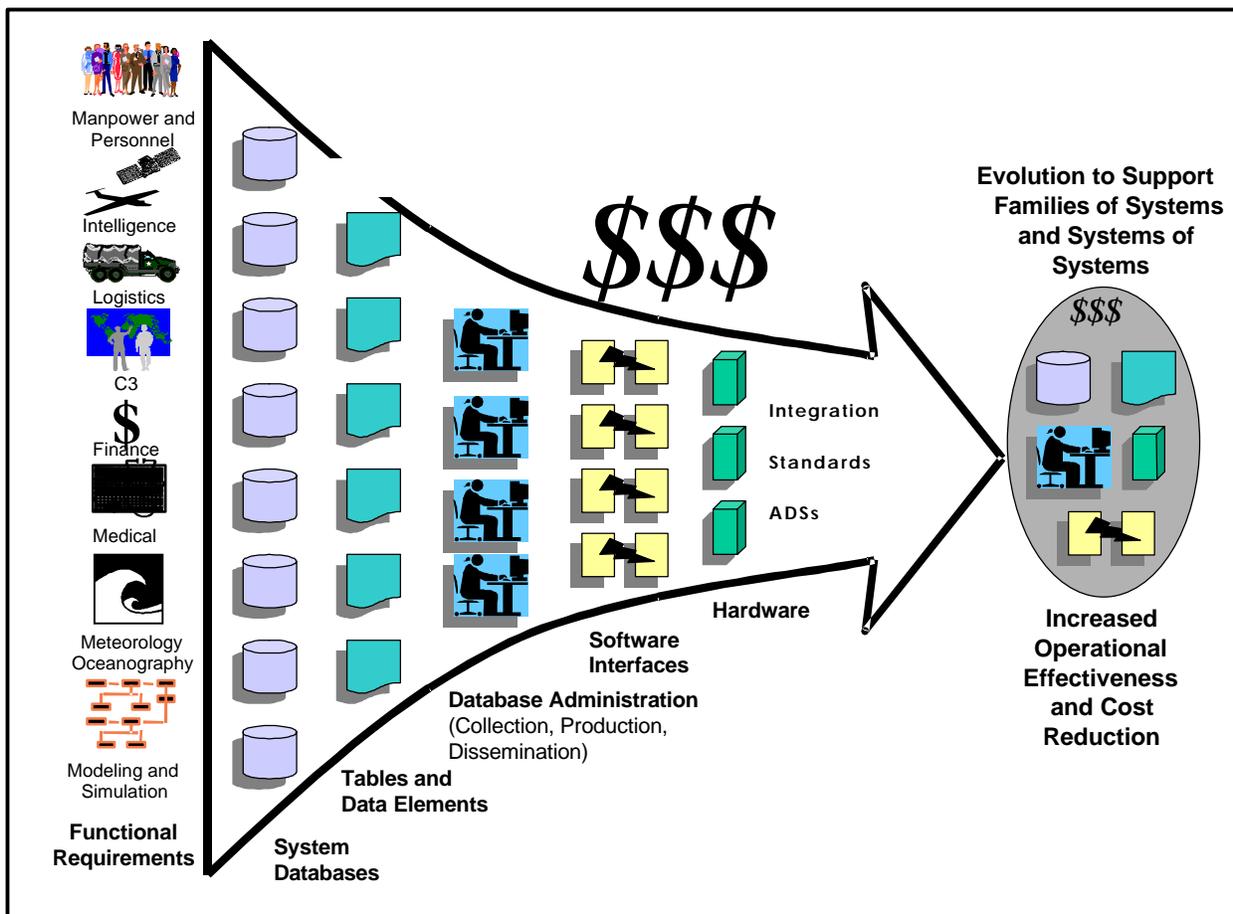
**Measures of Performance:**

Metric 1: Navy and Marine Corps implementing documents issued  
Metric 2: Service data administrators designated  
Metric 3: FDMs designated by Resource Sponsors  
Metric 4: PMO designated  
Metric 5: DMI Efforts budgeted by Resource Sponsors and FDMs  
Metric 6: System Data Interoperability Compliance Testing implemented

**Goal 2 – Reduce the Life Cycle Cost of Data Through Integration, Standards, and the Use of Authoritative Data Sources**

**Description:**

Today, data is typically developed, obtained and maintained by the system using it. In addition to multiplying costs, this approach limits data sharing and systems data interoperability. Translations and manipulation of data are costly and reduce IT Return on Investment (ROI). The objective is to create data once, share it across system boundaries and avoid the cost of redundant efforts. This requires visibility, accountability, and responsibility for data costs just as it does in all other cost areas. Exhibit 10 depicts the integration of data efforts to reduce future development and maintenance costs and increase ROI.



**Exhibit 10. The Life Cycle Cost of Data**

**OBJECTIVE 2-1: Focus DMI Efforts****Planning and Implementation Strategies**

- Identify and prioritize focus areas
  - Identify required operational capabilities; e.g. Combat Identification (CID), Single Integrated Air Picture (SIAP) or emerging concepts (e.g. focused logistics)
  - Identify systems (Naval, Joint, Allied) that support these requirements
  - Prioritize by operational and economic factors
  - Issue POM Guidance stating DMI focus areas

**OBJECTIVE 2-2: Develop and implement data standards****Planning and Implementation Strategies**

- Develop database and message data standards that are responsive to community/family of systems requirements
  - Reconcile data
- Consolidate redundant databases
  - Leverage ongoing ERP and migration system efforts
- Reduce unique systems data interfaces
  - Develop standard interfaces using DON data architectures
  - Explore emerging techniques for standard database transfer (e.g. XML)
- Submit candidate standard data elements to DDDS
  - Implement standard data element submission procedures

**OBJECTIVE 2-3: Develop and implement Authoritative Data Sources****Planning and Implementation Strategies**

- Identify ADSs by mission usage
- Determine responsibilities for data production

**Products:**

POM Guidance, data standards, ADSs, database production guidance

**Measures of Performance:**

Metric 1: Improved data interoperability between specified systems

Metric 2: Cost Savings for existing systems achieved through database consolidation

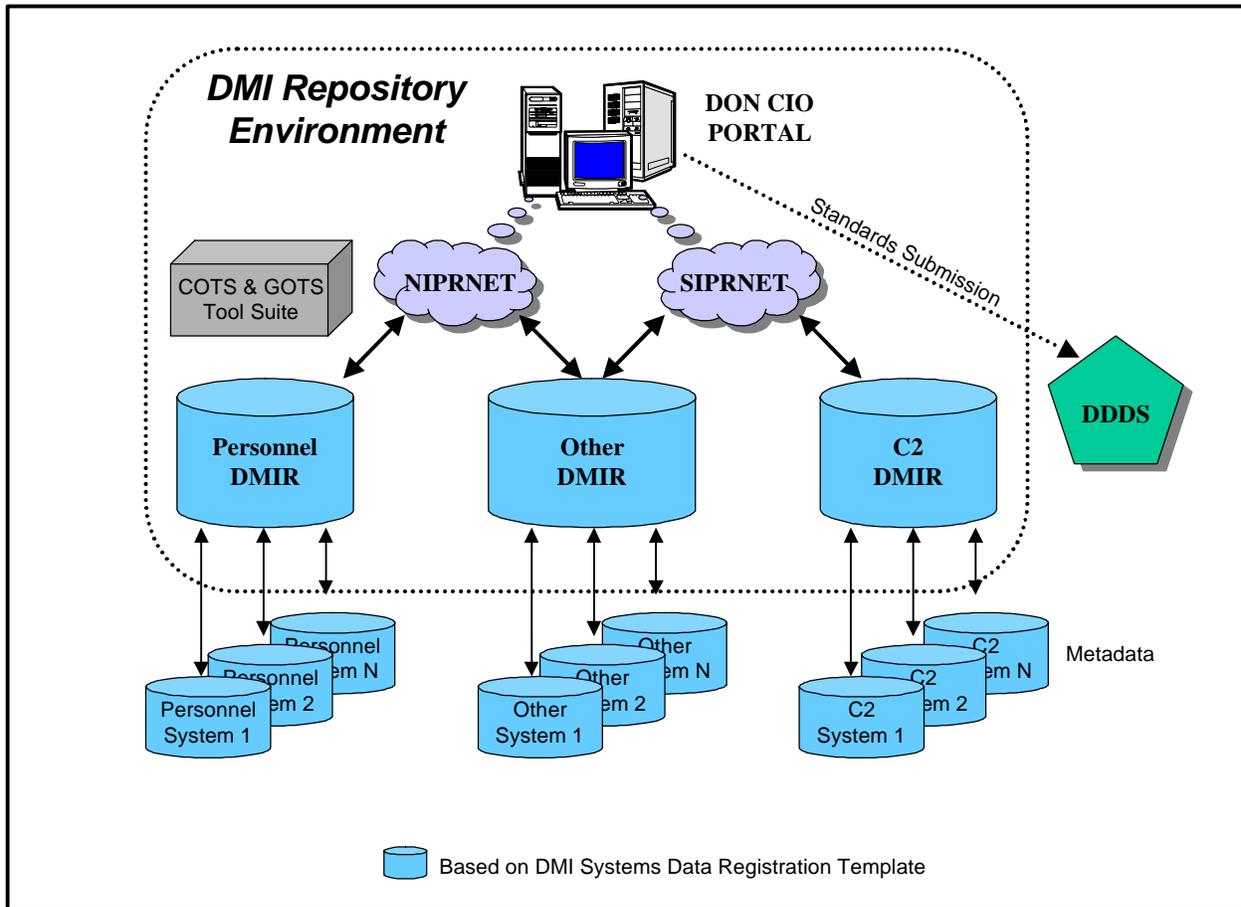
Metric 3: Cost Savings and improved decision support achieved through use of ADSs

Metric 4: Cost Avoidance achieved for new systems through re-use of standard data structures and reduced unique data interfaces

**Goal 3 – Provide a DMI Repository and Tools to Support IT Assessments and Engineering**

**Description:**

The DON DMI Repository (DMIR) is envisioned as a centrally managed network of metadata repositories, as shown in Exhibit 11, which will link to functional repositories/data warehouses, some of which are already under construction. The DON CIO will coordinate the definition of a common registration template and CONOPS, which will support query and response between repositories. The DON CIO will be supported by a repository, which will provide the enterprise view of data requirements, availability, and services as cited by DOD and the ITSG. The federation of functionally tailored repositories is needed to fully support and implement DOD and JCS interoperability requirements and is consistent with the C4ISR architecture data model (CADM).



**Exhibit 11. DON DMI Repository CONOPS**

**OBJECTIVE 3-1: Establish DON DMI Repository capabilities by September 2001****Planning and Implementation Strategies**

- Determine metadata requirements for:
  - Data Integration
  - Database Consolidation
  - DOD Data Element Standardization
  - Systems Data Interoperability Assessments
  - Compliance Testing
  - Configuration Management
  - IT Assessments
- Capitalize on other repository efforts to lower costs and assure internal and external interoperability
  - Evaluate other DMI repository efforts
  - Develop a repository CONOPS that supports DON enterprise management
  - Develop standards-based metadata approach to access and retrieve data
  - Provide a Systems Catalog and Index of databases to support developers and data services
  - Register legacy systems metadata as part of or in support of ongoing integration business reengineering efforts/Pilot Projects
- Provide DMIR user interface and reference tools
  - Facilitate system access, use of DMIR
  - Facilitate use of naming conventions

**OBJECTIVE 3-2: Provide metadata capture and analysis tools in order to optimize functional database production****Planning and Implementation Strategies**

- Designate metadata tool suite
- Document database elements produced and used
- Document database elements used but not produced
- Document database elements produced but not used
- Document system to system data interfaces

**Products:**

Repository CONOPS, specification, registration template, Metadata tool suite, standard access authorization models, systems database catalog, interoperability and IT assessment capabilities.

**Measures of Performance:**

Metric 1: Metadata repository concept of operations defined and validated

Metric 2: Metadata repository specification

Metric 3: Standup of repository

Metric 4: Percent of systems metadata registered in DMI Repository

## Goal 4 – Provide a Data Architecture Which Addresses Both Information Requirements and Data Capabilities

### Description:

The DON Data Architecture is an organized and structured map of data needed to support the DON enterprise objectives. It serves as a framework for organizing and managing the inter-relationships of the mission-critical data. This framework contains both the optimal design of the data based on high level analysis of all DON information requirements; as well as, the actual implemented structures of data as stored and used by existing operational systems. The views and models of the data and their relationships provide the basis for deriving measures of performance, such as interoperability, and for guiding the definition of data standards needed to satisfy operational requirements.

As depicted in Exhibit 12 the DON Data Architecture is developed from the top down and the bottom-up. The top-down approach creates an over-arching context of DON's data based on the information requirements of the missions, functions, goals and strategies of the DON organizations. The bottom-up approach captures the actual, physical structures of data as implemented in operational systems and maps them to the top-down models. The integration of these two approaches creates an iterative cycle of assessment and design which over-time will drive and influence DOD systems towards an integrated systems environment with databases structured according to standard models and definition.

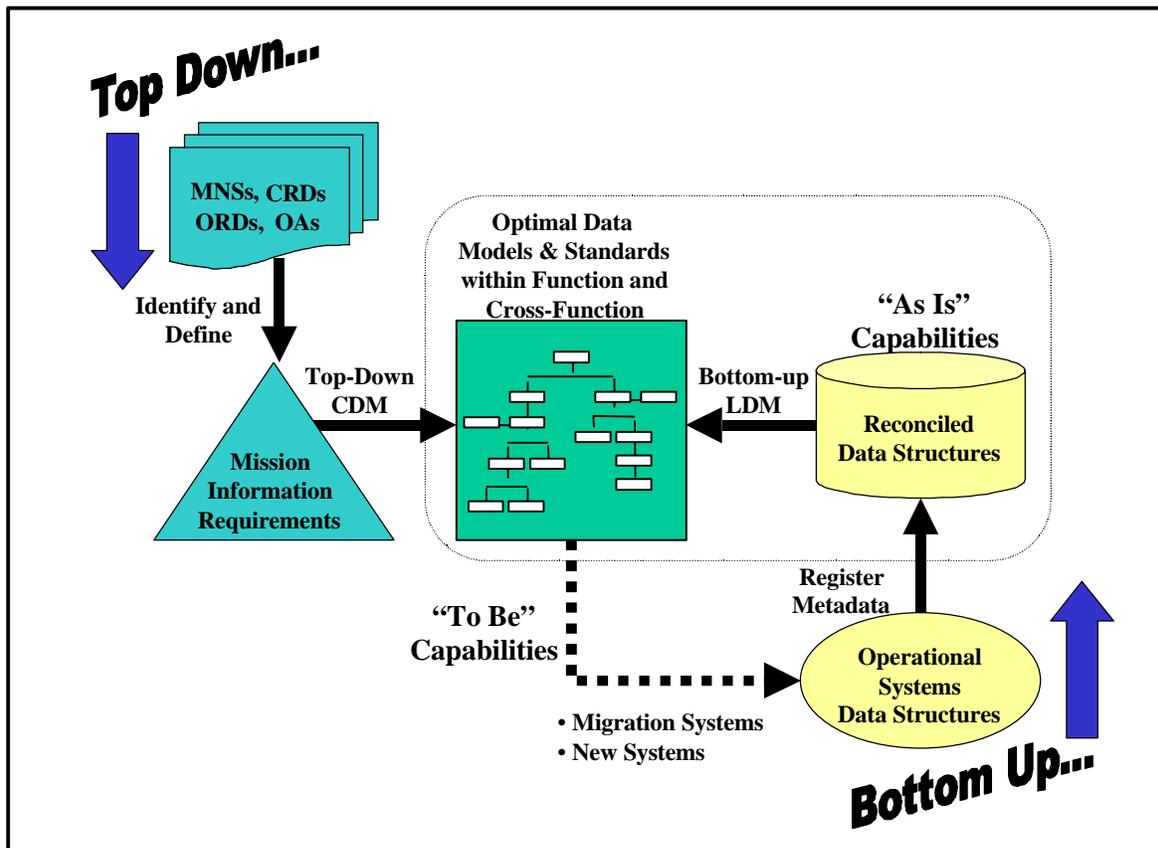


Exhibit 12. Methodology for Developing DON Data Architecture

**OBJECTIVE 4-1: Establish and maintain DON data capabilities baseline****Planning and Implementation Strategies**

- Document Data Capabilities Bottom-up
  - Identify mission critical systems (Y2K database)
  - Document the metadata characteristics of the systems databases
  - Produce system database models and data element dictionaries
  - Establish mappings between physical and logical data models

**OBJECTIVE 4-2: Establish and maintain DON information requirements baseline****Planning and Implementation Strategies**

- Define Information Requirements Top-down
  - Develop Activity/Process models
  - Document Information Exchange Requirements (IERs)
  - Develop entity relationship (conceptual) model of data
  - Establish mappings between conceptual and logical and conceptual and physical data models

**OBJECTIVE 4-3: Develop DON Data Architectures****Planning and Implementation Strategies**

- Apply C4ISR architecture approach and data model to support:
  - Data Integration
  - Database Consolidation
  - DOD Data Element Standardization
  - Systems Data Interoperability Assessments
  - Data Services (Data Push and Data Pull)
  - Compliance Testing
  - Configuration Management
  - IT Assessments
  - Information Assurance Assessments
  - Business process reviews
  - Knowledge Management

**Products:**

Process/Activity models, data models (logical, conceptual, physical systems), data dictionaries, interoperability and IT assessment reports

**Measures of Performance:**

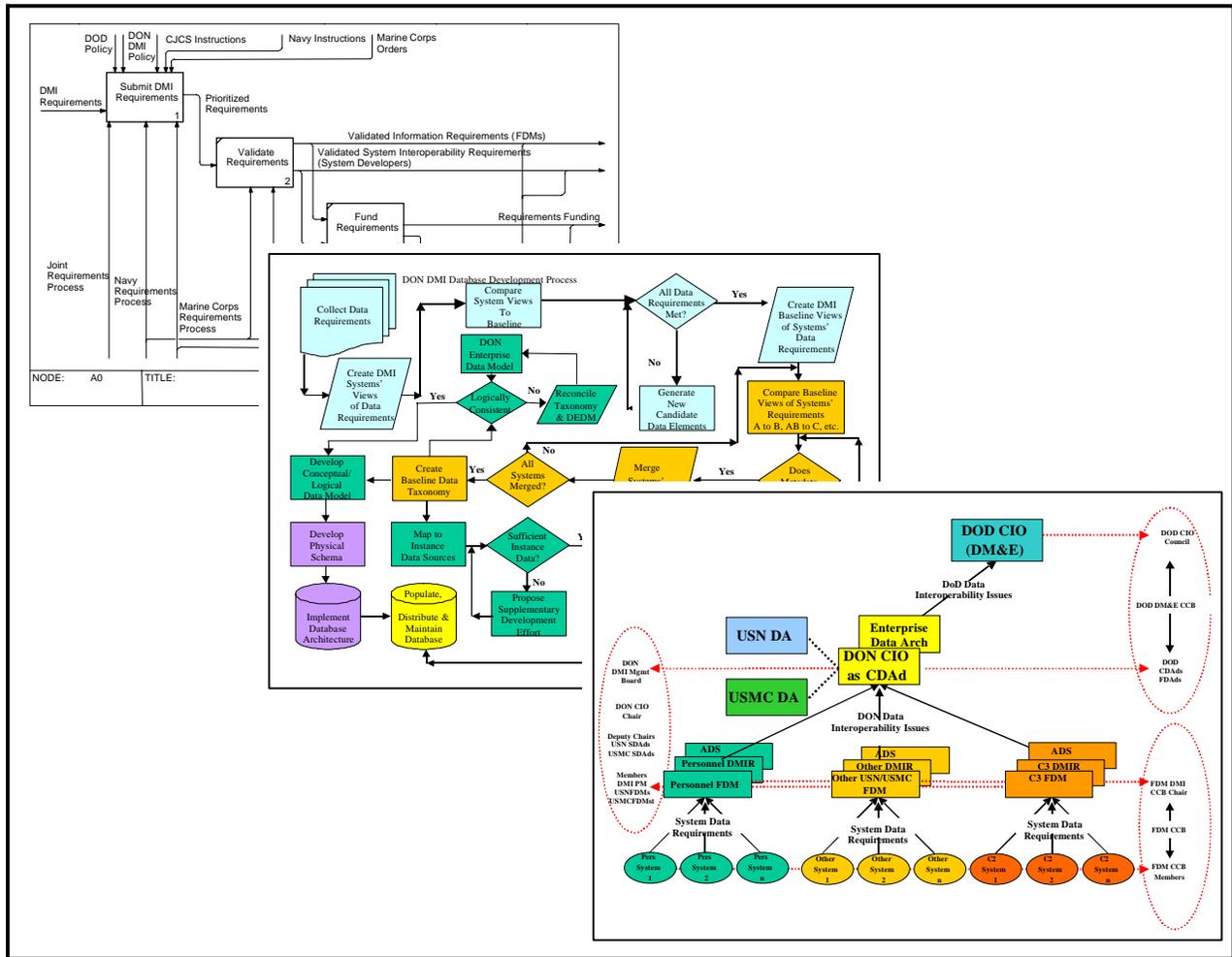
- Metric 1: Percent of registered systems databases integrated and consolidated
- Metric 2: Percent completion of Functional Data Architectures
- Metric 3: Percent completion of Enterprise Data Architecture
- Metric 4: Degree of satisfaction of operational requirements by the current data architecture

## Goal 5 – Provide Processes and Metrics to Enable and Evaluate Data Management and Data Engineering

**Description:**

After-action reports have identified similar data problems for years in spite of major investments. These problems persist in part because of a lack of effective enterprise data management and engineering mechanisms. This goal addresses the processes, procedures, and metrics necessary to providing such mechanisms. It does so in a way that is responsive to DOD and DON guidance and supports ongoing interoperability efforts across systems and organizations and with other services. It also provides the framework for evaluating and unifying existing DMI efforts.

Exhibit 13 shows representative processes for DMI Requirements, Database Development, and Configuration Management. These and other processes are required to solve current data interoperability problems and avoid creating new ones.



**Exhibit 13. Example of DON DMI Processes**

**OBJECTIVE 5-1: Develop standard DMI processes and procedures****Planning and Implementation Strategies**

- Use Integrated Product Team (IPT) to define and develop processes for:
  - Management
  - PPBS
  - Acquisition
  - DMI Repository Implementation
  - Data Architecture
  - Data Standards
  - ADSs
  - Interoperability and IT Assessment Support
  - Training
  - Outreach
  - DMI Evaluation
- Integrate DMI into Fleet and Fleet Marine Force tactics, techniques, and procedures developments

**OBJECTIVE 5-2: Develop and refine metrics for cost and operational assessments of Navy and Marine Corps DMI efforts.****Planning and Implementation Strategies**

- Define and develop metrics for:
  - DMI Infrastructure
  - DMI processes
  - Designated DMI efforts

**OBJECTIVE 5-3: Plan and implement technology and process refresh to support DMI.**

- Assess emerging information technology for data interoperability
- Implement process improvement as needed

**Products:**

DMI IPT charter, DMI Implementation Planning Guide

**Measures of Performance:**

Metric 1: Number of processes and procedures developed

Metric 2: Percentage of processes and procedures approved and implemented



### 3. ROLES AND RESPONSIBILITIES

Exhibit 14, DMI Interrelationships, provides a high level overview of the DMI organization:

- DON CIO shall issue DMI policy/guidance to Navy and Marine Corps.
- Navy and Marine Corps Data Administrators shall support the DON CIO in the development and maintenance of the DON DMI Strategic Plan; and develop and maintain a Joint DMI implementation plan to resolve systems data interoperability and cross-functional issues.
- Functional Data Managers shall implement functional processes to produce and monitor the use of data within functional activities, information systems, and computing and communications infrastructures; and designate Authoritative Data Sources (ADS) and maintain that designation in the DMI Repository (DMIR) using processes and procedures developed by the DON CIO, for their respective functional areas.

Specific responsibilities are described in the SECNAVINST for DMI.

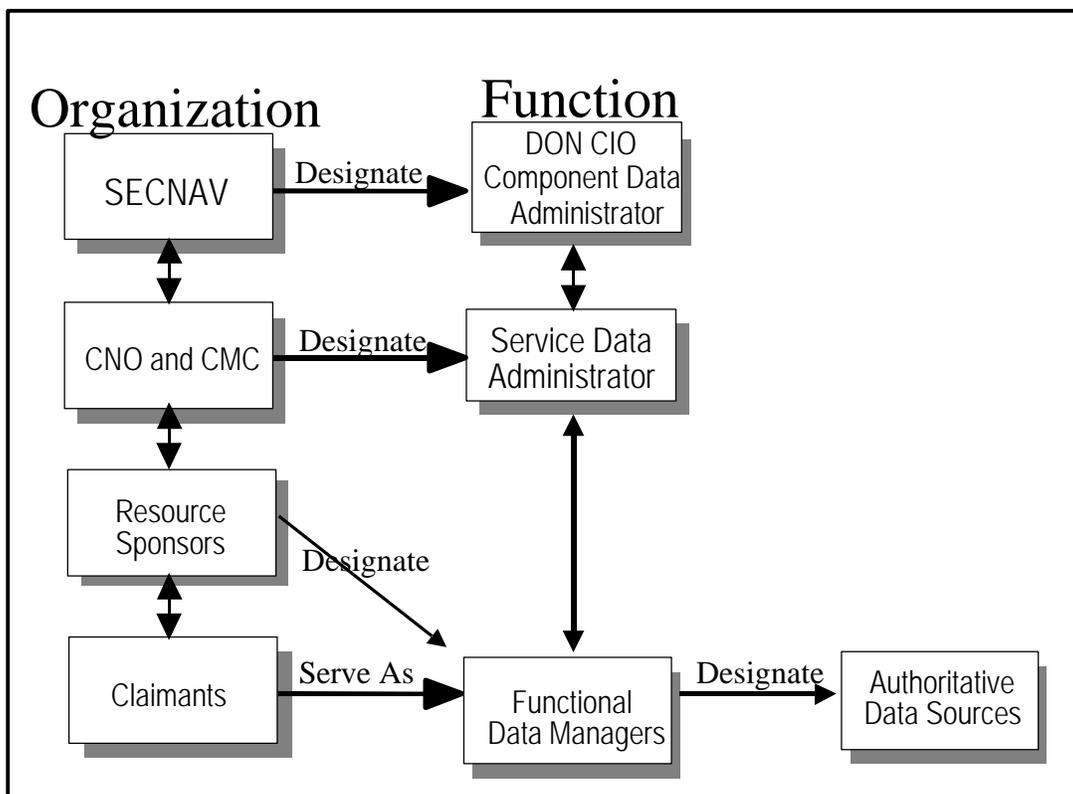


Exhibit 14. DMI Interrelationships



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## 4. IMPLEMENTATION

Implementation of the DON DMI Strategic Plan will be through the roles and responsibilities identified in the SECNAVINST for DMI, a DMI Implementation Plan, and a series of DMI Action Plans.

Emphasis will be on rapid improvements in operational performance, reducing costs and defining the baseline for reengineering efforts. Emphasis will also be on maximum use of existing resources to include institutionalizing DMI concepts and processes into organizational procedures and operational doctrine across the Department and throughout the chain of command.

### 4.1. Planning Strategy

This strategic plan is based on the guidance provided in the DON IM&IT Strategic Plan and the evolving DOD Data Management Strategic Planning Guidance (Draft). Improvements in DMI require an overarching view of the current process, a vision of the desired end-state, and a set of clearly defined goals that must be achieved to reach it. The means of achieving the goals, in the form of specific actions that must be taken across the DON, will be identified. The result is the articulation of a business model for data management and interoperability efforts. The model addresses the definition of requirements, mechanisms to support data access, processes that support the proper use of data, and the overall management and governance required.

Information superiority requires the enterprise to focus on data as a necessary tool for information warfare. The importance of data to the enterprise must be institutionalized through clear and concise policy. The increased access to information and the speed of transferring data presents security challenges. The DON's data assets must be governed through effective Data Management policy and guidance. Such policies should provide a realistic and sound foundation for creating, collecting, processing, disseminating, using, storing, and protecting data. They should also establish a mechanism/means for implementing a repository concept whereby data is accessible worldwide; and for using or dealing with commercially developed standards.

An enterprise information architecture must be developed to manage enterprise data assets. This architecture must remain consistent with the evolving DOD and Federal IT architectures and standards.

To ensure the program is managed effectively, an organizational infrastructure must be established to include sponsorship from senior leaders. Establishing clear mechanisms that assigns responsibility and enforce accountability reinforce the importance of enterprise Data Management. Establishing measurement mechanisms that gauge reuse, cost reduction, and interoperability will enable DON to assess progress in achieving the DMI mission and vision.

### 4.2. Investment Strategy

The DMI infrastructure will be created from existing efforts and resources, through the PPBS/POM/DON Capital Planning process, and by incorporating DMI into Strategic Navy Initiatives such as ERP pilot processes and the Navy/Marine Corps Intranet.

This plan does not address specific programs or budgets. It does provide a common vision and strategic direction to guide implementation investment activities aimed at the common goal. Each stakeholder will develop a portfolio of information technology investments, based on identified criteria, to accomplish

DON goals, objectives and strategies. Those portfolios will, as specified in the DON IT Capital Planning Guide, provide the roadmap for allocation of resources contained in the DON DMI Strategic Plan. Planners will identify alternatives, rate them in terms of predicted effectiveness and, in coordination with the Office of the DON CIO, select the strategy or set of strategies that best achieve the objective.

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## Appendix A

### DOD Data Management Goals

DOD Data Management Strategic Planning Guidance identifies the following goals, objectives, and strategies:

#### **DOD Goal 1: Identify and document data requirements.**

Objective 1-1: Register data that enables horizontal and vertical data sharing department wide.

- |              |  |
|--------------|--|
| Strategy 1.1 | Establish an enterprise-wide architecture                                      |
| Strategy 1.2 | Identify, capture and improve data requirements within communities of interest |
| Strategy 1.3 | Implement common data within information systems                               |

#### **DOD Goal 2: Establish an enterprise data infrastructure and supporting services.**

Objective 2.1: Improve user capability to locate and retrieve data.

- |                |   |
|----------------|---|
| Strategy 2.1   | Develop a standards-based metadata approach to easily discover and retrieve appropriate data          |
| Strategy 2.2   | Develop and maintain a DOD Data Repository/Registry to capture metadata                               |
| Strategy 2.2.1 | Provide the commander or manager the flexibility to select the data he/she needs when he/she needs it |
| Strategy 2.2.2 | Develop a standard access authorization model utilizing enterprise-wide user profiles                 |

#### **DOD Goal 3: Provide consistent and interoperable data services.**

Objective 3.1: Move to an information service paradigm.

- |              |   |
|--------------|---|
| Strategy 3.1 | Implement Internet-based data repository services at all levels of the Department |
| Strategy 3.2 | Provide uniform mechanisms for access and delivery of data                        |
| Strategy 3.3 | Provide global visibility of and access to authoritative data sources             |

#### **DOD Goal 4: Assess and apply quality characteristics and conformance measures.**

Objective 4.1: Embed data quality characteristics and conformance measures in the acquisition life cycle.

- |              |   |
|--------------|---|
| Strategy 4.1 | Define and implement a process (including methods and techniques) for ensuring data quality (embed in the acquisition life cycle process) |
| Strategy 4.2 | Conduct data quality assessments  |
| Strategy 4.3 | Establish a data quality awareness and incentive initiative   |

**DOD Goal 5: Provide efficient policies and procedures, sufficient resources, and an effective organizational infrastructure.**

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Objective 5.1: Institutionalize enterprise data as a valued asset.

- |              |   |
|--------------|---|
| Strategy 5.1 | Establish policies, assign responsibilities, and delegate authorities that provide for effective Data Management  |
| Strategy 5.2 | Institutionalize a process for managing data that reflects a strong linkage to the Information Management Strategic Plan, DOD Strategic Plan, Joint Warfighters Plan, and business/functional area plans  |
| Strategy 5.3 | Establish streamlined processes and management structures at appropriate levels that reflect a team-oriented, collaborative, and enterprise-wide approach to data management                              |
| Strategy 5.4 | Include data management requirements in capital planning (i.e., PPBS) and investment control process  |
| Strategy 5.5 | Design programs aimed at acquiring, developing and retaining a well-trained and educated workforce that is knowledgeable about principles, procedures, and technologies of good data management practices |

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## Appendix B

### DON Information Management and Information Technology Goals

The DON Information Management & Information Technology Strategic Plan FY 2000-2001 identifies nine goals and their objectives as cited below:

**GOAL 1: Provide an information technology infrastructure that will ensure information superiority and connectivity throughout the Department of the Navy.**

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**Supporting Objectives:**

- 1.1 Develop, implement, operate, and govern a Naval Intranet.
- 1.2 Collaboratively develop, maintain, and facilitate the implementation of the DON IT infrastructure architecture.
- 1.3 Collaboratively develop, maintain, and facilitate the minimal number of IM/IT standards necessary to support interoperability.
- 1.4 Collaboratively develop, maintain, and facilitate the implementation of cohesive DON data, data flow, and systems architectures.

**GOAL 2: Reengineer warfighting and core business processes in parallel with technology infusion to maximize effectiveness and efficiency.**

---

**Supporting Objectives:**

- 2.1 Develop and sustain a DON IM/IT strategic planning process that serves as a mechanism for guiding DON IM/IT activities.
- 2.2 Implement strategies to facilitate IM/IT process improvement and develop DON enterprise process models and tools.
- 2.3 Improve DON IM/IT processes through collaboration among stakeholders and Industry partners.
- 2.4 Exploit Electronic Business, Electronic Commerce, Enterprise Resource Planning, and emerging technologies to reengineer and improve DON processes. Encourage bottom-up initiatives and develop pilot projects to assess the use and applicability of each of these technologies.
- 2.5 Investigate the use and applicability of Enterprise Resource Planning, Supply Chain Management, and other commercial off-the-shelf software tools to assess their potential to increase the efficiency and effectiveness of DON processes.

**GOAL 3: Maximize the value and manage the risk associated with DON information technology investments.**

---

**Supporting Objectives:**

- 3.1 Implement a continuous and repeatable process for the selection and management of IM/IT investments throughout the DON.
- 3.2 Develop and implement a standard process and modeling tool to assess and reduce the investment and total cost of ownership of IM/IT implementation through the DON.
- 3.3 Exploit outsourced management strategies and the use of metrics to enable DON IM/IT professionals to focus on core mission functions.
- 3.4 Implement a DON-wide process to provide visibility of IM/IT investments and assets to facilitate investment planning.
- 3.5 Use enterprise licenses to leverage DON buying power for IT.

---

**GOAL 4: Implement strategies that facilitate the creation and sharing of knowledge to enable effective and agile decision-making.**

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**Supporting Objectives:**

- 4.1 Develop strategies for managing knowledge and achieve a common understanding of the definition and value of knowledge management.
- 4.2 Identify knowledge management champions at the Command level throughout the DON enterprise.
- 4.3 Build repositories to capture processes to share our intellectual capital.
- 4.4 Encourage collaborative information sharing through communities of practice and the use of knowledge management strategies.
- 4.5 Provide tools to facilitate the optimum use of information to create knowledge for tactical and strategic decision making.
- 4.6 Modernize policies and processes for coordination of Naval Libraries, technical and administrative information repositories, and other virtual information resources, aligning and integrating them with the DON IM/IT mission and vision to provide a framework for the future.

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**GOAL 5: Exploit emerging information technologies to achieve breakthrough performance.**

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**Supporting Objectives:**

- 5.1 Identify and exploit information technologies and share innovative technology applications throughout the DON.
- 5.2 Implement technology solutions to improve business functions, operational effectiveness, and communications between our deployed forces and their families.
- 5.3 Develop a DON strategy to implement Electronic Business/ Electronic Commerce (EB/EC).
- 5.4 Exploit Smart Card technology to enable functional process change and knowledge management.
- 5.5 Exploit browser and web technologies to enable flexible and timely information exchange in both warfighting and mission support processes.
- 5.6 Encourage innovation and assess the use of emerging technologies through Fleet Battle Experiments, Wargames, and Simulations.

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**GOAL 6: Ensure the DON's information resources are secure and protected.**

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**Supporting Objectives:**

- 6.1 Develop Information Assurance vision, strategy, policies and architecture.
- 6.2 Protect and ensure the availability of the DON information technology assets, afloat and ashore, tactical and non-tactical, in a world-wide distributed environment.
- 6.3 Make Information Assurance an "enabling technology" providing confidentiality, integrity and non-repudiation.
- 6.4 Provide strong, ubiquitous and secure authentication to information technology users and assets. Implement Public Key Infrastructure (PKI) and issue digital certificates on Smart Cards to all DON employees.
- 6.5 Ensure the provision of Information Assurance awareness and training to all system planners, developers, users and administrators.
- 6.6 Develop the capability to diagnose the health of mission-critical networks.

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**GOAL 7: Resolve Y2K issues to ensure a smooth transition into the next millennium.**

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**Supporting Objectives:**

- 7.1 Ensure that all DON systems, both mission critical and mission support, are certified Y2K compliant and fully implemented.
- 7.2 Establish and manage a process, which ensures the Y2K readiness of all DON facilities and infrastructure information technology assets, ashore and afloat.

- 
- 7.3 Ensure that Congressional and OSD mission critical system testing requirements are met by DON organizations; monitor testing results.
  - 7.4 Establish requirements for, and monitor progress of Year 2000 Contingency and Continuity of Operations Planning across the DON.
  - 7.5 Establish requirements and issue guidance for a DON Consequence Management Plan to ensure that all organizations and sailors, marines, and their families will be able to operate normally through the Y2K conversion period.
  - 7.6 Identify opportunities to leverage Y2K data and lessons learned as enablers for future DON efforts.
  - 7.7 Implement Y2K communications and awareness strategies, both within and external to DON.
  - 7.8 Provide centralized program management for the DON and all Year 2000 requirements, policy, procedures, status, issues, information and results.

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**GOAL 8: Build IM/IT competencies to shape the workforce of the future.**

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**Supporting Objectives:**

- 8.1 Identify and sustain IM/IT core capabilities.
- 8.2 Organize and manage the military and civilian IM/IT Professional Community and provide career development opportunities for the IM/IT workforce.
- 8.3 Provide cost-effective IM/IT education, training, and learning opportunities for our Sailors, Marines, and Civilians.
- 8.4 Develop and implement a strategy to facilitate critical thinking skills.
- 8.5 Take advantage of IM/IT Distributive Learning opportunities.

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**GOAL 9: Foster and incentivize a technology-enabled information-rich culture.**

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**Supporting Objectives:**

- 9.1 Develop an IM/IT communications and outreach strategy to ensure effective information flow among and between DON and external government and industry organizations.
  - 9.2 Develop an intellectually stimulating and technologically attractive workplace in order to attract and retain the best sailors, marines and civilians.
  - 9.3 Recognize and incentivize value-added IM/IT and KM solutions.
  - 9.4 Use IM/IT to facilitate information sharing across DON in support of our deployed sailors, marines, and their families.
  - 9.5 Establish open dialogue and partner with our allies to promote technology exchange and interoperability.
  - 9.6 Develop an understanding of the organizational and cultural implications of information technology.
  - 9.7 Partner with DOD, other governmental organizations, and industry to leverage IM/IT best practices and share lessons learned.
  - 9.8 Provide tools and information on IM/IT products and services to the DON workforce to sustain a technology-enabled and information-rich culture.
  - 9.9 Build awareness of the value of Electronic Business and Electronic Commerce.
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## GLOSSARY

**Authoritative Data Source.** Data products including databases that have been identified, described, and designated by appropriate DON Functional Data Managers, US Military Services and DOD Components for DOD support.

**Data.** A representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by humans or by automatic means. (FIPS Pub 11-3). Data are distinct pieces of information, usually formatted in a special way. All software is divided into two general categories: data and programs. Programs are collections of instructions for manipulating data.

**Data Administration.** The responsibility for definition, organization, supervision, and protection of data within an enterprise or organization. (NBS Special Publication 500-152)

**Data Administrator (DA).** A person or group that ensures the utility of data used within an organization by defining data policies and standards, planning for the efficient use of data, coordinating data structures among organizational components, performing logical data base designs, and defining data security procedures. (NBS Special Pub 500-152)

**Data Architecture.** A framework for organizing the interrelationships of data, (based on an organization's missions, functions, goals, objectives, and strategies), providing the basis for the incremental, ordered design and development of systems based on successively more detailed levels of data modeling. (DODD 8320.1)

**Data Engineering.** The discipline of decomposing information requirements into a system(s) data architecture. It includes database design, data standards, retrieval, authoritative data sources, distribution, and flow (interoperability).

**Data Management.** Data Management is a sub-set of Information Management. It deals with the creation, use, sharing, and disposition of data as a resource critical to the effective and efficient operation of functional activities. The structuring of functional processes to produce and monitor the use of data within functional activities, information systems, and computing and communications infrastructures. (DODD 8000.1 modified)

Data Management, for the purpose of this instruction, adds executive and operational dimensions to the data administration functions as defined in DOD Directive 8320.1 of 26 Sep 91. The executive dimension assures DMI decisions reflect senior management goals and objectives. The operational dimension assures the data management infrastructure and functions are linked to current and future operational requirements.

**Data Standard.** A data element that has been through a formal analysis to reach agreement on its name, meaning, and characteristics, as well as its relationship to other standard data elements. Much like a common language, data standards enable processes and their supporting information systems to be integrated across functions, as well as within them, and improve the quality as well as the productivity of enterprise performance. (DEPSECDEF Memo of 13 Oct 1993, "Accelerated Implementation of Migration Systems, Data Standards, and Process Improvement)

**Database.** A collection of interrelated data, often with controlled redundancy, organized according to a schema to serve one or more applications; the data are stored so that they can be used by different programs without concern for the data structure or organization. A common approach is used to add new data and to modify and retrieve existing data. (FIPS Special Pub 11-3)

**Database Segment.** A standard method for packaging a physical database for incorporation into Shared Data Engineering (SHADE). Database segments are packaged like any other Common Operating Environment (COE) segment. (DII COE I&RTS, Version 4.0)

**Family-of-Systems.** A set or arrangement of independent systems that can be arranged or interconnected in various ways to provide different capabilities. The mix of systems can be tailored to provide desired capabilities dependent on the situation.

**Functional Area.** A functional area encompasses the scope (the boundaries) of a set of related functions and data for which an OSD Principal Staff Assistant or the Chairman of the Joint Chiefs of Staff has DoD-wide responsibility, authority, and accountability. A functional area (e.g., personnel) is composed of one or more functional activities (e.g., recruiting), each of which consists of one or more functional processes (e.g., interviews). Also known as a business area. (DoD 8320.1-M)

**Functional Data Manager.** Organizations designated by the respective Resource and Program Sponsors to produce and control structuring of data within functional activities, information systems, and computing and communications infrastructures. Examples include: Naval Meteorology and Oceanography Command for meteorological and oceanographic data, Office of Naval Intelligence for characteristics and performance data of non-U.S. equipment and merchant ships, Naval Security Group for cryptologic information and data, DC/S Installations & Logistics (I&L) for Marine Corps logistics.

**Horizontal Integration** is the identification and consolidation of common data across functional areas.

**Information.** 1. Facts, data, or instructions in any medium or form. 2. The meaning that a human assigns to data by means of the known conventions used in their representation. (Joint Pub 1-02)

**Information Assurance.** Information operations that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and non-repudiation. This includes providing for restoration of information systems by incorporating protection, detection, and reaction capabilities.

**Information Exchange Requirement.** The requirement for information to be passed between and among forces, organizations, or administrative structures concerning ongoing activities. Information exchange requirements identify who exchanges what information with whom, as well as, why the information is necessary and how that information will be used.

**Information Interoperability.** The exchange and use of information in any form, electronically that enables effective operations for both warfighting and combat support areas both within the DoD and external activities, and synchronizes both material and non-material aspects.

**Information Management.** The creation, use, sharing, and disposition of information as a resource critical to the effective and efficient operation of functional activities. The structuring of functional processes to produce and control the use of data and information within functional activities, information systems, and computing and communications infrastructures. (DODD 8000.1)

**Information Superiority.** The capability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying an adversary's ability to do the same.

**Information Technology.** Any equipment, or interconnected system or subsystem of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information. The term "equipment" in this definition means equipment used by a Component directly, or used by a contractor under a contract with the Component, which requires the use of such equipment, or requires the use, to a significant extent, of such equipment in the performance of a service or the furnishing of a product. The term "IT" includes

computers, ancillary equipment, software, firmware and similar procedures, services (including support services), and related resources. The term “IT” includes National Security Systems. (40 USC 1401 and Reference (a), Sec 5002)

**Infrastructure.** The basic underlying resources used for data management including; data, data architecture and models, data management technology, metadata, processes, procedures and data standards. There are two components of the DON Data Management and Interoperability infrastructure:

Management Component: DON CIO, ASN (RDA), Navy and Marine Corps Data Administrators, Board of Representatives, and Data Management IPT.

Engineering Component: DON Data Architecture which includes information requirements and models; and the DON DMI Repository which includes a systems catalog, systems database structures, data element definitions, transfer formats and standards, and data sources and users.

**Interoperability** is the ability of systems, units or forces to provide services to, and accept services from, other systems, units or forces, and to use the services so exchanged to enable them to operate effectively together (CJCS Pub 1-02).

**Knowledge Management.** The strategies and processes to create, identify, capture, organize, and leverage vital skills, information, and knowledge to enable people to best accomplish the organizational missions (American Productivity and Quality Center).

**Metadata.** Information describing the characteristics of data; data or information about data; descriptive information about an organization’s data, data activities, systems, and holdings. (DOD 8320.1-M-1)

**National Security System.** Any telecommunications or information system operated by the United States Government, the function, operation, or use of which: (a) involves intelligence activities; (b) involves cryptologic activities related to national security; (c) involves command and control of military forces; (d) involves equipment that is an integral part of a weapon or weapons system; or (e) subject to limitation below, is critical to the direct fulfillment of military or intelligence missions. Limitation—Item (e) does not include a system that is to be used for routine administrative and business applications (including payroll, finance, logistics, and personnel management applications).

**Program Manager.** The organization responsible for the development and execution of a solution to a validated operational requirement. Also known as system developer.

**Program Sponsor.** The organization which validates operational requirements and supports development of solutions. Also known as resource sponsor.

**Revolution in Business Affairs (RBA).** RBA is a strategy that encompasses the following objectives: (1) sense of urgency to act among the top leaders, (2) broad leadership commitment and involvement, (3) engagement of leaders at several levels in initiatives across the Department, (4) early achievement of improvements, (5) a process that harnessed the best practices in strategic planning and business reengineering in the private sector, and (6) a systematic method to translate the best practices in business to DON activities.

**Revolution in Military Affairs (RMA).** RMA centers on developing the improved information and command and control capabilities needed to significantly enhance joint operations.

**System-of-Systems.** A set or arrangement of systems that are related or connected to provide a given capability. The loss of any part of the system will degrade the performance or capabilities of the whole.

**User.** A user is a data customer.

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## LIST OF ACRONYMS

|        |   |
|--------|---|
| ADSs   | Authoritative Data Sources                                |
| C2     | Command and Control                                       |
| C3I    | Command, Control, Communications, and Intelligence        |
| CADM   | C4ISR architecture data model                             |
| CDRL   | Contract Data Requirements List                           |
| CID    | Combat Identification                                     |
| CIO    | Chief Information Officer                                 |
| COE    | Common Operating Environment                              |
| CONOPS | Concept of Operations                                     |
| CRD    | Capstone Requirements Document                            |
| DDDS   | Defense Data Dictionary System                            |
| DID    | Data Item Descriptions                                    |
| DII    | Defense Information Infrastructure                        |
| DMI    | Data Management and Interoperability                      |
| DMIR   | DMI Repository  |
| DOD    | Department of Defense                                     |
| DON    | Department of Navy  |
| EB/EC  | Electronic Business/Electronic Commerce                   |
| ELINT  | Electronic Intelligence                                   |
| ERP    | Enterprise Resource Planning                              |
| FDMs   | Functional Data Managers                                  |
| GPRA   | Government Performance and Results Act                    |
| IDEF   | Integrated Computer Aided Manufacturing (ICAM) Definition |
| IERS   | Information Exchange Requirements                         |
| IM&IT  | Information Management and Information Technology         |
| IPT    | Integrated Product Team                                   |
| I&RTS  | Integration and Runtime Specification                     |
| IT     | Information Technology                                    |
| ITSG   | Information Technology Standards Guidance                 |
| JCS    | Joint Chiefs of Staff                                     |
| LISI   | Levels of Information Systems Interoperability            |
| MTF    | Message Text Format                                       |
| MNS    | Mission Needs Statement                                   |
| NMCI   | Navy/Marine Corps Intranet                                |
| NTTL   | Navy Tactical Task List                                   |

## LIST OF ACRONYMS (Cont'd)

|            |                                     |
|------------|-------------------------------------|
| OAs        | Operational Architecture            |
| ORD        | Operational Requirement Document    |
| PKI        | Public Key Infrastructure           |
| POM        | Program Objective Memorandum        |
| PPBS       | Program, Planning, Budgeting System |
| RBA        | Revolution in Business Affairs      |
| RMA        | Revolution in Military Affairs      |
| ROI        | Return on Investment                |
| SECNAVINST | Secretary of the Navy Instruction   |
| SHADE      | Shared Data Engineering             |
| SIAP       | Single Integrated Air Picture       |
| TADIL      | Tactical Digital Information Link   |
| UJTL       | Universal Joint Task List           |
| XML        | Extensible Markup Language          |
| Y2K        | Year 2000                           |