Department of Defense
Deputy Assistant Secretary of Defense
(Information Management)
Records Management Task Force

The Department of Defense
Records Management
Function and Information Models

October 6, 1995

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Executive Summary

This report presents the Department of Defense (DoD) Records Management (RM) Function and Information models for the year 2003. The models depict an agreed process and data requirements for the creation of records throughout the DoD. The models provide the framework for the development of activities for office automation, automated information systems, and work flow systems.

The trend today is to manage records using automated support tools while maintaining records on their original media. Collaborative efforts with experts in archival science show that methods successfully used over the centuries to manage paper records may not be complete enough to support the management of electronic records. Existing RM guidance varies widely within the DoD. The standards needed to use automation to create and manage electronic records today are minimal at best.

The function model has the viewpoint of person, intended to be any employee of DoD who produces or receives records as a normal function of their mission related duties. As such, the model concentrates on the first of three parts of RM: CREATE RECORDS. Support staff and records managers perform the duties of the other two parts: MAINTAIN RECORDS and DISPOSE OF RECORDS. The majority of people in the DoD have no involvement in these two processes; therefore the function model omits MAINTAIN RECORDS and DISPOSE OF RECORDS. A second model is required to depict records maintenance and disposition. That model is the Genesis and Preservation of an Agency's Archival Fonds[1].

The information model centers on the entities RECORD, RECORD-ASSOCIATION, RECORD-CATEGORY, and RECORD-STATUS. Each contains attributes (data elements) essential to describe records. One set of attributes from the model is standard already within DoD. The Office of the Deputy Assistant Secretary of Defense for Information Management (ODASD(IM)) (RM Task Force) will submit additional attributes for standardization by 1996. Additional effort is required to develop the information requirements for disposition instructions and to integrate this model with various other functional community models that create and use records.

A second purpose of this report is to explain changes made to the models since they were first published in January 1994 and April 1994. Some changes result from the realization that the average person (viewpoint) does not participate in the maintenance and disposition of records. Some changes result from knowledge gained developing functional requirements for RM software. Other changes result

[1] DoD RM TF & University of British Columbia School of Library, Archival and Information Studies, *Applying IDEF Methodology to Describe Archival Science and Diplomatics - Report 2*

from knowledge gained from the international academic fields of archival science and diplomatics that require organization to ensure the integrity of their records (their reliability and authenticity).

U.S. Department of Defense
Deputy Assistant Secretary of Defense (Information Management) Records Management Task Force
The Department of Defense Records Management Function and Information Models

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Appendices

1 Overview

This report provides the current function and information models for Records Management (RM) within the Department of Defense (DoD), provides an explanation of their key features, and describes the evolution of the models.

A Reader's Guide to Function Models is at Appendix A. Readers are encouraged to review this before attempting to "read" the records creation function model that is presented in Section 2. Section 2 contains an overview of the RM function model; the function model to include graphic diagrams, text diagrams, and glossary; and an explanation of the evolution of the original model to this edition.

A Reader's Guide to Information Models is at Appendix B and again readers are encouraged to review this before attempting to "read" the records management information model that is presented in Section 3. The Section 3 format is similar to that of Section 2. It contains an overview of the RM information model; the information model to include graphic diagrams, relationship report, and glossary; and an explanation of the evolution of the original model to this edition.

Joint component teams of records managers, with a few automation personnel participating in regard to technical issues, produced both models. The Function Model was first published in the DoD RM Functional Process Improvement (FPI) TO-BE Report of January 14, 1994. The Information Model was initially published in the DoD RM FPI TO-BE Information Model Report, with Change 1, of February 10 & 15, 1994. The FPI group evolved to a Business Process Reengineering (BPR) Team that continued to study the issues that the models address. A sub-element of the FPI group and BPR team was the technical team whose purpose was to determine if the models could be supported by current and pending automation technology. The BPR project ended in July 1994, but the initiative continued with the formation of the RM Task Force (TF) in January 1995. Areas of study undertaken by the RM TF that impact upon the content of the models include:

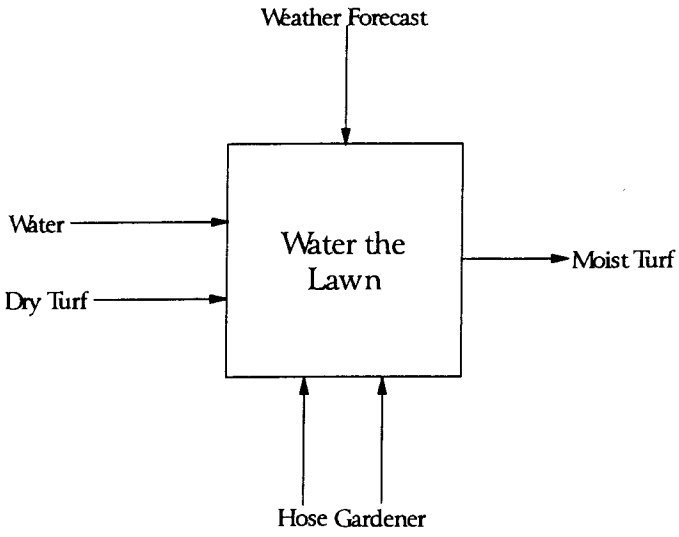
- Authoring and Coordinating the Automated Document Conversion Master Plan,
- Developing Functional Requirements and Test Requirements for Electronic Records Management Software (ERMS), and
- Exploring the International Academic Disciplines of Archival Science and Diplomatics.

2 Records Management Function Model, 2003

2.1 Overview of Function Models

The reader is invited to read Appendix A, Reader's Guide to IDEF0 Function Models, before reviewing the function model in this section. The U.S. Government standard for IDEF0 function models is published in the Federal Information Processing Standard (FIPS) 183.

Throughout function models, functions (also known as activities or processes) are represented by rectangles (also called boxes). *Inputs* enter functions as arrows entering the left side of the function box. *Outputs* exit functions as arrows departing the right side of the function box. *Controls*, directions on when or how to perform the function, enter the function as arrows entering the top of the box. *Mechanisms* enable the function to occur without themselves being consumed or transformed (as are inputs). Mechanisms enter function boxes from the bottom.



This simple function may be read, "As presented in the weather forecast (control), the gardener using a hose (both mechanisms), watered the lawn (function) by applying water to dry turf (both inputs) to produce moist turf (output)."

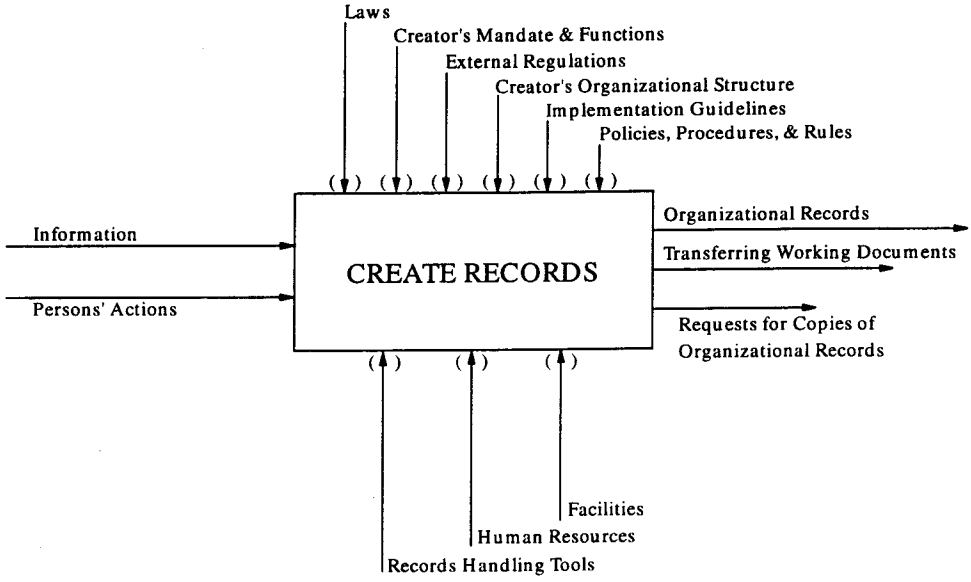
Functions and constraints divide into greater detail in subsequent diagrams, each diagram featuring three to six next lower level functions. An explanation of the "decomposition process" is provided at Appendix A.

2.2 Highlights of the DoD Records Management Function Model, 2003

The model reflects the way that records creation shall occur by the year 2003. The concepts embodied enable DoD personnel to do their jobs efficiently and to comply with laws regarding records creation in an era when most records are produced, maintained, and disposed in an electronic environment and stored on electronic media.

The viewpoint of the model is that of person (who works on behalf of the DoD). The person may be working in any functional area. Most DoD personnel create records as they carry out their normal duties.

In this model the term "organizational records" refers to documents that meet the legal definition of records within the U.S. government. The legal scope is broad; any recorded information that documents the business of the government and is (or should be) preserved is a record (organizational record). Other recorded information that does not meet the criteria to be a record is "nonrecord material" or "working documents."



The name of the highest level function is CREATE RECORDS. The definition is, "To document the business of the government in a systematic manner so that appropriate information will be preserved to support mission and business needs." The name of the highest level function, CREATE RECORDS, reflects that most people engage in only the first of the three major activities in records management. The three activities are creation, maintenance, and disposition. The latter two activities are carried out by a limited number of personnel who are

entrusted with this responsibility. Maintenance and disposition are outside the viewpoint and scope of the model.

The inputs to CREATE RECORDS are "information" and "persons' actions." Persons' actions are "conscious exercise of the will aimed to create, maintain, modify, or extinguish situations." A transaction is an example.

The reason for the CREATE RECORDS function is to produce the primary output, "organizational records." A secondary output is "requests for copies of organizational records." Organizational records will be stored so they can be maintained as authentic and reliable evidence of DoD's mission and business activities. The person will be able to obtain copies of organizational records. These copies reenter the model as information. A third output is "transferred working papers," an instance of one person giving nonrecord materials to another person.

The mechanism "records handling tools" include automated support aides. Some commercial products exist today; however the model accommodates these and even more capable tools that have not yet been invented.

The parenthesis markings at the arrow heads of most controls and mechanisms indicate that these apply to lower levels on the model but are not shown on those diagrams to reduce clutter.

A review of lower levels of the model reveals that while persons make both organizational records and nonrecord material, they only maintain, transfer, and destroy nonrecord materials (working documents).

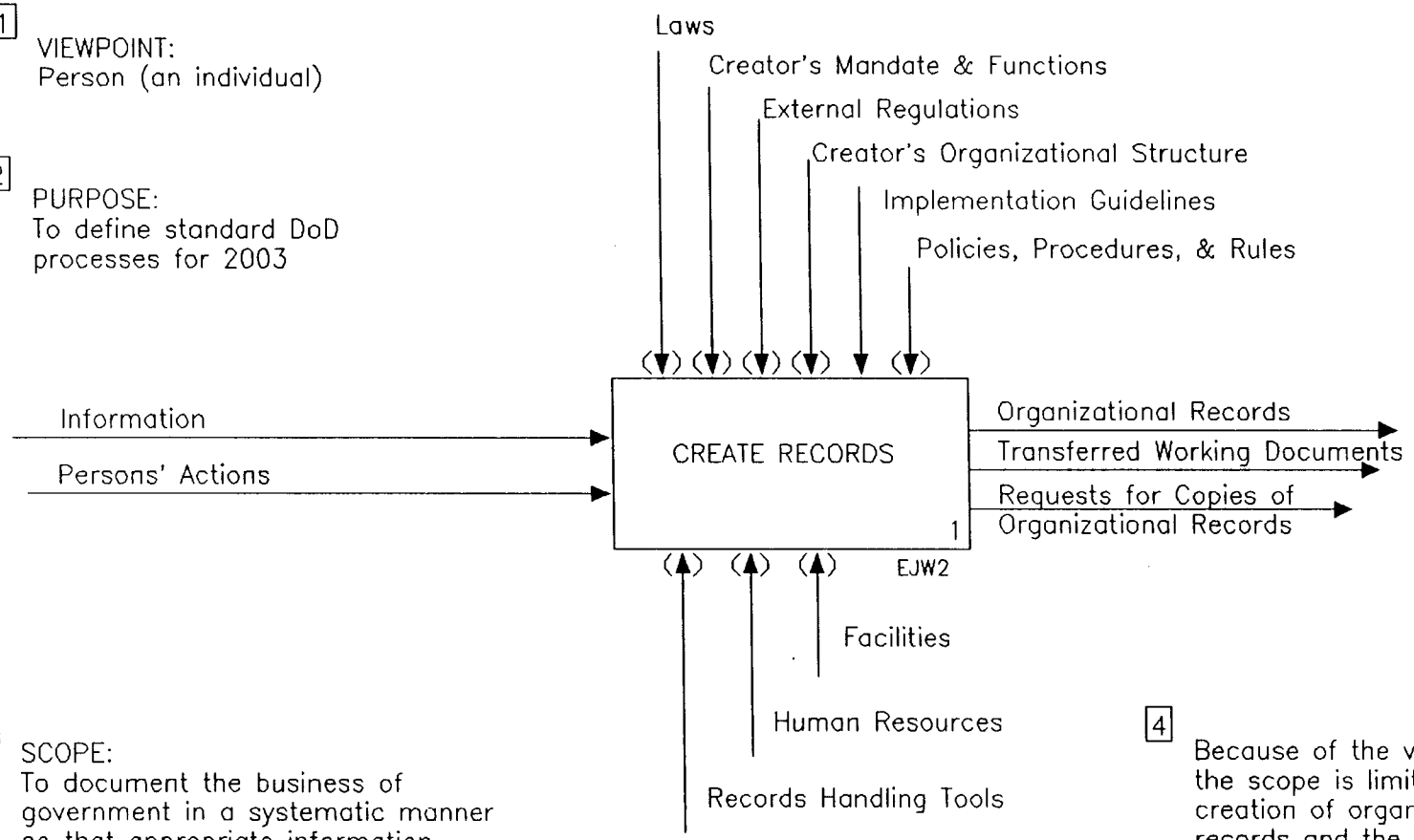
Two types of textual information supplement the graphical diagrams. Text diagrams provide a narrative explanation of the main features of the diagram. A glossary defines all terms used on the function model diagrams. Text diagrams are printed on the reverse face of the graphic diagram sheet; the glossary is at section 2.4. The model is only complete with both its diagrams and its text — the reader can only understand the authors' intent by reviewing the diagrams and text together.

2.3 Diagrams

USED AT	AUTHOR : Ed Wyse	DATE:05/19/95	X	WORKING	READER	DATE	CONTEXT
	PROJECT : DOD-RM	REV. :10/10/95		DRAFT			
	COMPANY: ANDRULIS RESEARCH CORPORATIONEXIT			RECOMMENDED			
	NOTES : 1 2 3 4 5 6 7 8 9 10			PUBLICATION			

1 VIEWPOINT:
Person (an individual)

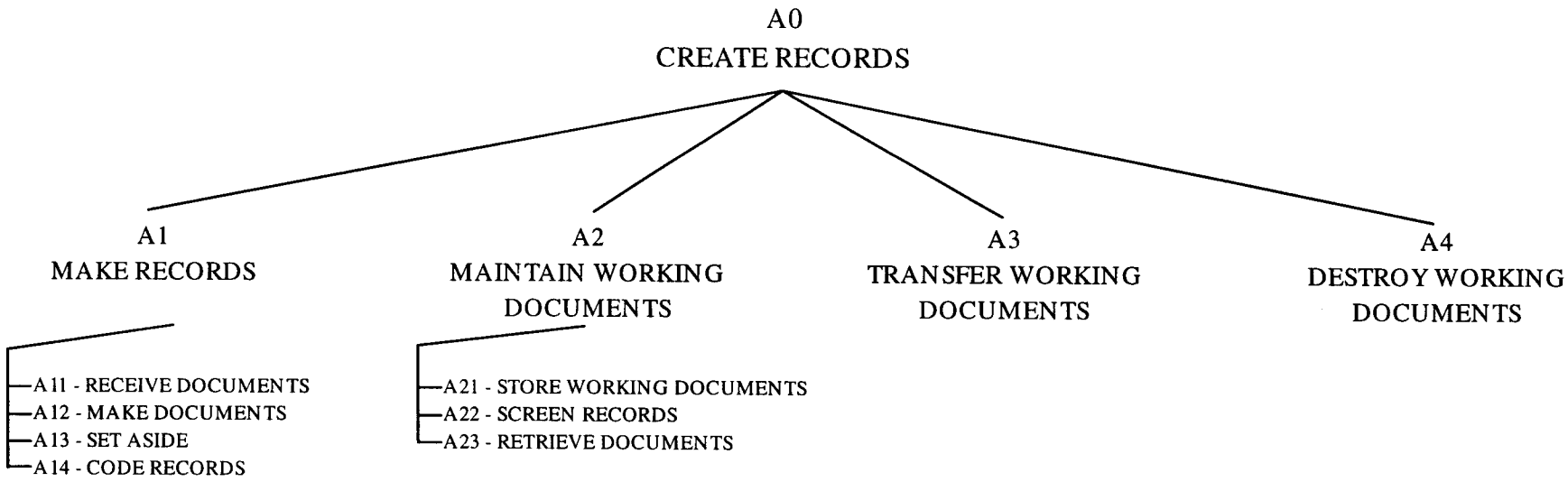
2 PURPOSE:
To define standard DoD processes for 2003

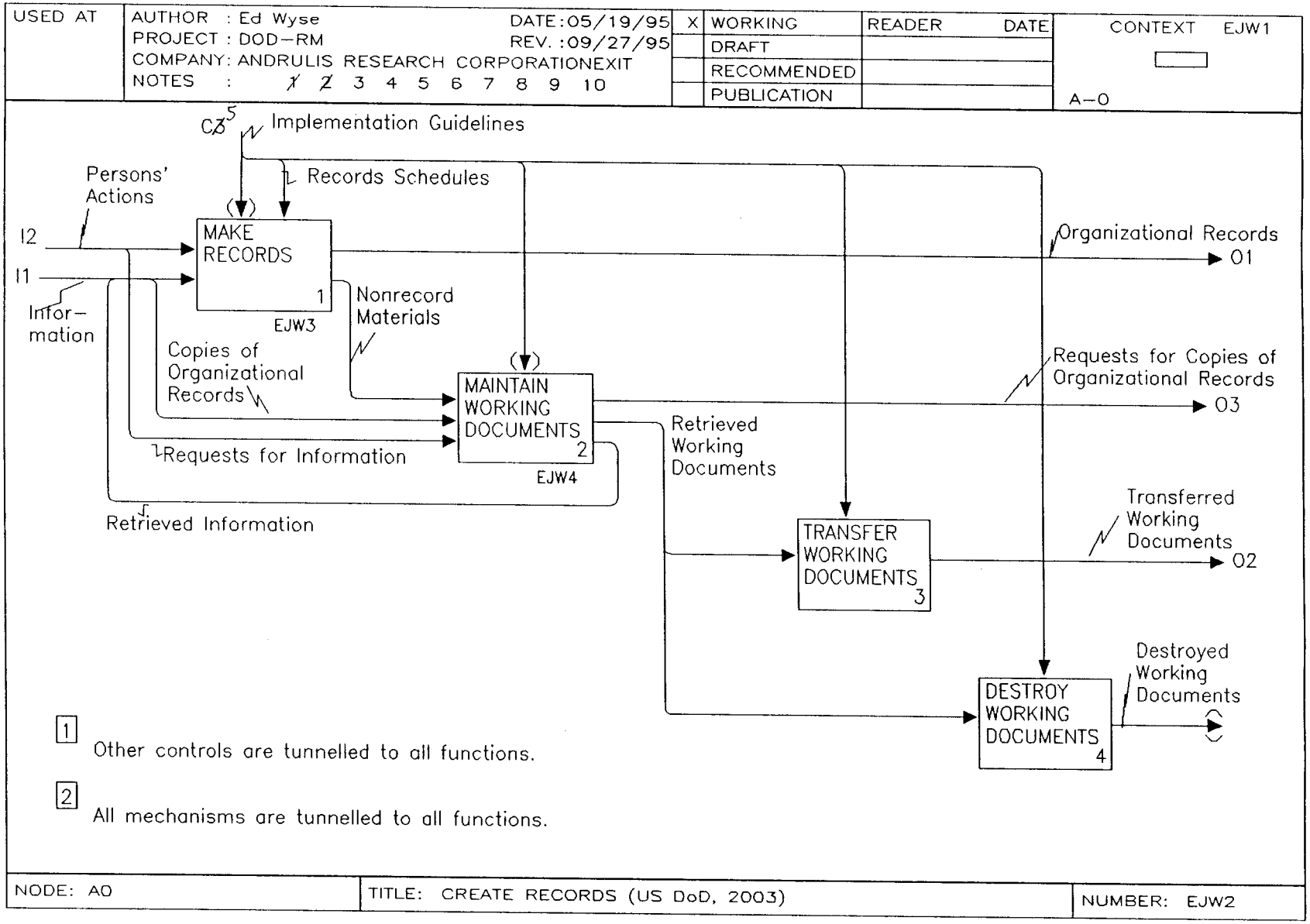


3 SCOPE:
To document the business of government in a systematic manner so that appropriate information will be preserved as records to support mission and business needs.

4 Because of the viewpoint, the scope is limited to the creation of organizational records and the creation, maintenance and disposition of documents, working papers, and copies.

NODE: A-0	TITLE: CREATE RECORDS (US DoD, 2003)	NUMBER: EJW1


A0
CREATE RECORDS
A1
MAKE RECORDS
A2
MAINTAIN WORKING DOCUMENTS
A3
TRANSFER WORKING DOCUMENTS
A4
DESTROY WORKING DOCUMENTS
A11 - RECEIVE DOCUMENTS
A12 - MAKE DOCUMENTS
A13 - SET ASIDE
A14 - CODE RECORDS
A21 - STORE WORKING DOCUMENTS
A22 - SCREEN RECORDS
A23 - RETRIEVE DOCUMENTS

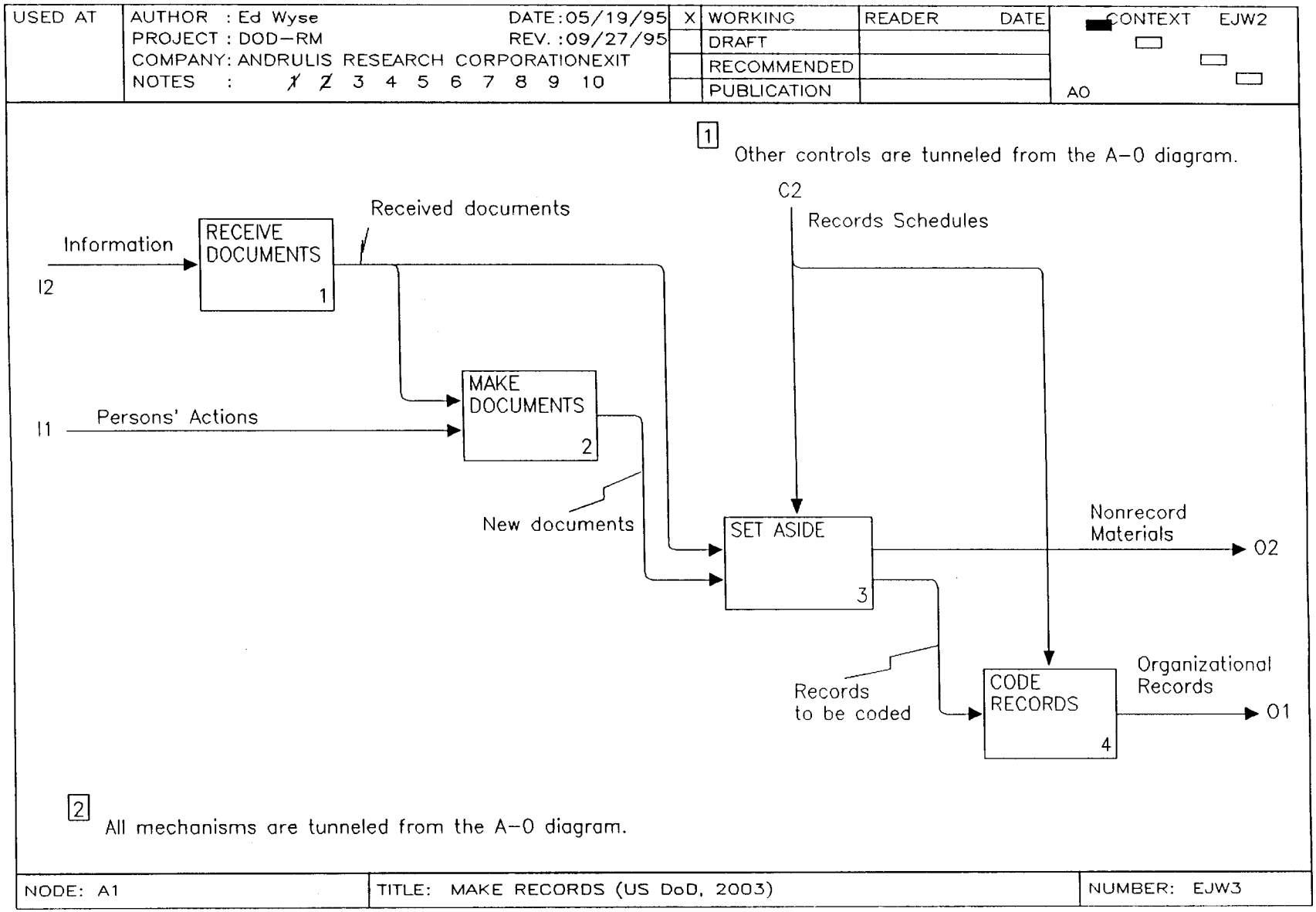

USED AT
AUTHOR : Ed Wyse
PROJECT : DOD-RM
COMPANY: ANDRULIS RESEARCH CORPORATIONEXIT
NOTES : 1 2 3 4 5 6 7 8 9 10
DATE:05/19/95
REV. :09/27/95
X WORKING
DRAFT
RECOMMENDED
PUBLICATION
READER DATE
CONTEXT EJW1
A-0
C5
Implementation Guidelines
Persons' Actions
Records Schedules
I2
I1
Infor-mation
MAKE RECORDS
1
EJW3
Organizational Records
O1
Nonrecord Materials
Copies of Organizational Records
MAINTAIN WORKING DOCUMENTS
2
EJW4
Requests for Copies of Organizational Records
O3
Retrieved Working Documents
Requests for Information
Retrieved Information
TRANSFER WORKING DOCUMENTS
3
Transferred Working Documents
O2
DESTROY WORKING DOCUMENTS
4
Destroyed Working Documents
1 Other controls are tunnelled to all functions.
2 All mechanisms are tunnelled to all functions.
NODE: A0
TITLE: CREATE RECORDS (US DoD, 2003)
NUMBER: EJW2

A0: CREATE RECORDS

"Persons' actions" and "Information" are the materials from which records are made (A1). "Implementation Guidelines," especially the "Records Schedules," dictate how records are created. The primary product of MAKE RECORDS (A1) is "Organizational Records," which is a boundary level output for this model. The "Organizational Records" leave the control of the "Person" (the model's viewpoint) and enter into a protected status controlled by records managers assisted by RM software. A second output of MAKE RECORDS (A1) is "Nonrecord Materials," that recorded information the "Person" keeps to perform work, but which does not by itself qualify to be records.

The person manages "Working Documents" in the MAINTAIN WORKING DOCUMENTS (A2) function. "Requests for Information," internal or external to the agency, may trigger use of the "Working Documents." The "Person" may supplement on-hand "Working Documents" by submitting "Requests for Copies of Organizational Records" and receiving the "Copies of Organizational Records." The received "Copies of Organizational Records" also become "Working Documents." The primary output of MAINTAIN WORKING DOCUMENTS (A2) is "Retrieved Working Documents." A second important output is "Retrieved Information," i.e., information extracted from the working documents.

"Retrieved Working Documents" may be transferred (A3) or destroyed (A4).

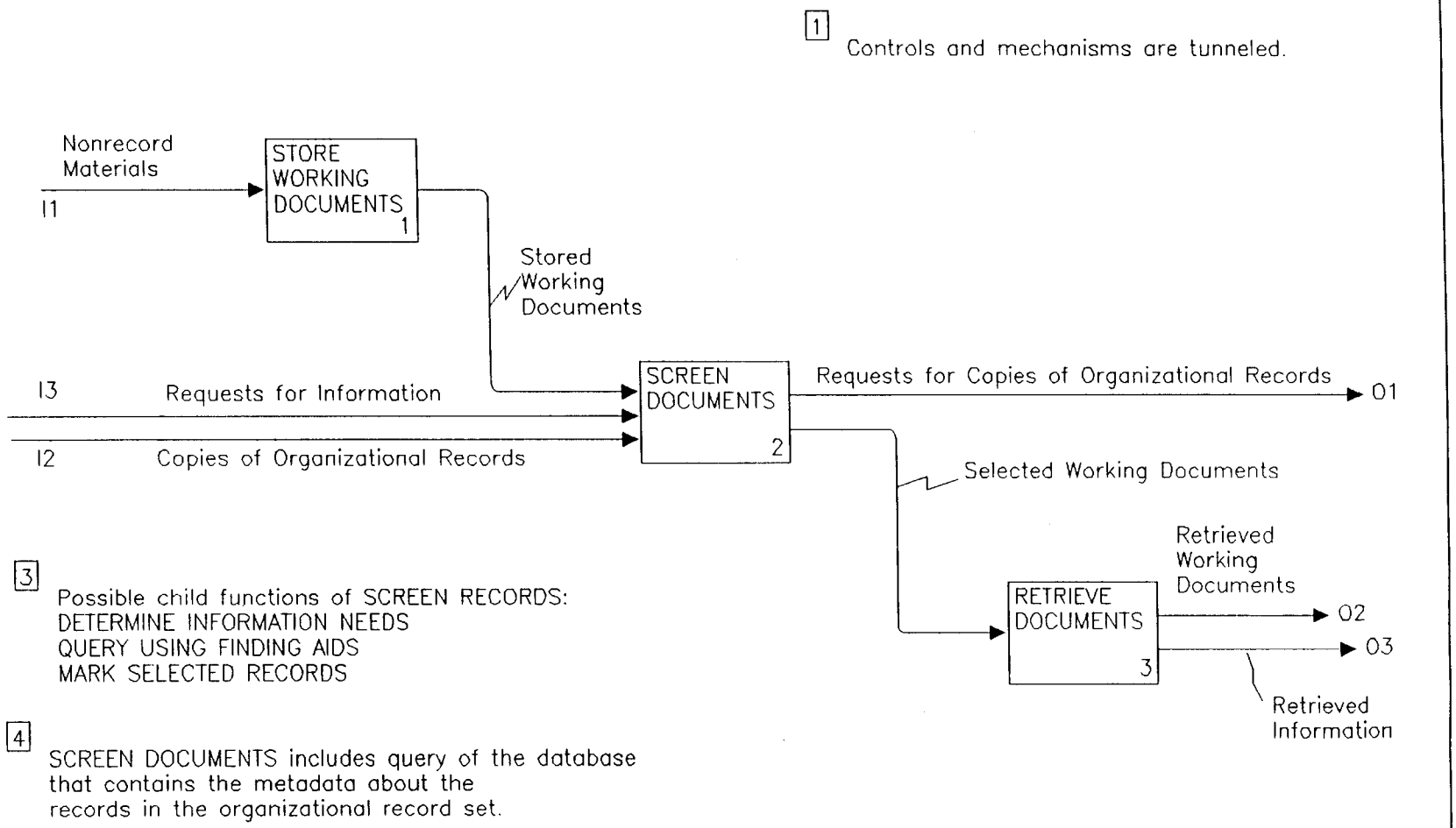

USED AT
AUTHOR : Ed Wyse
DATE:05/19/95
PROJECT : DOD-RM
REV. :09/27/95
COMPANY: ANDRULIS RESEARCH CORPORATIONEXIT
NOTES : 1 2 3 4 5 6 7 8 9 10
X WORKING
DRAFT
RECOMMENDED
PUBLICATION
READER DATE
CONTEXT EJW2
A0
1 Other controls are tunneled from the A-0 diagram.
C2
Records Schedules
Received documents
Information
I2
RECEIVE DOCUMENTS
1
MAKE DOCUMENTS
2
I1
Persons' Actions
New documents
SET ASIDE
3
Nonrecord Materials
02
Records to be coded
CODE RECORDS
4
Organizational Records
01
2 All mechanisms are tunneled from the A-0 diagram.
NODE: A1
TITLE: MAKE RECORDS (US DoD, 2003)
NUMBER: EJW3

A1: MAKE RECORDS

The RECEIVE DOCUMENTS (A11) function accepts "Information" into the person's possession, acting on behalf of the agency. The MAKE RECORDS (A12) function uses "Persons' Actions" and "Received Documents" to produce "New Documents." "New Documents" can be produced from material as received from outside or material newly crafted by the functional processes of the agency. The SET ASIDE (A13) function divides the "New Documents" into "Nonrecord materials" and "Records to be Coded" (will be transformed into records). The CODE RECORDS (A14) function associates the record with the appropriate record category and related retention instructions and gives the record a unique identifier for control purposes.

The major output of the MAKE RECORDS (A1) function is "Organizational Records," the official set of records maintained in accordance with laws and regulations. A secondary output is "Nonrecord materials" which is all documents of interest to the person that do not match the definition of record.

USED AT	AUTHOR : Ed Wyse	DATE:05/20/95	X	WORKING	READER	DATE	CONTEXT EJW2
	PROJECT : DOD--RM	REV. :09/27/95		DRAFT			
	COMPANY: ANDRULIS RESEARCH CORPORATIONEXIT			RECOMMENDED			
	NOTES : 1 2 3 4 5 6 7 8 9 10			PUBLICATION			A0



NODE: A2	TITLE: MAINTAIN WORKING DOCUMENTS (US DoD, 2003)	NUMBER: EJW4

A2: MAINTAIN WORKING DOCUMENTS

MAINTAIN WORKING DOCUMENTS (A2) is the "Person" managing the "Working Documents" ("Nonrecord Materials") with which entrusted. "Working Documents" does not qualify as "Organizational Records" although copies of "Organizational Records" may be included in the set of "Working Documents." In a paper environment "Working Documents" are usually evidenced by "Desk Files." In an electronic environment "Working Documents" are usually manifested as electronic files maintained for convenience of the "Person."

The first function performed upon "Working Documents" is to store them (A21).

The "Stored Working Documents" and "Copies of Organizational Records" (or an index thereto) may be screened (A22) to find a particular individual document or to identify all documents meeting specified criteria. To obtain needed information, the "Person" may have to submit "Requests for Copies of Organizational Records."

After screening (A22) has produced "Selected Documents," RETRIEVE DOCUMENTS (A23) results in "Retrieved Working Documents" (entire documents or copies thereof) and "Retrieved Information" (extracts from the Working Documents").

2.4 Glossary

CODE RECORDS
A1 (A14)
To classify the record with the appropriate record category and to identify the record for storage and subsequent retrieval.

Copies of Organizational Records
A0, A2
Copies, rather than originals, of organizational records that action officers and analysts access for reference.

CREATE RECORDS
Scope
To document the business of government in a systematic manner so that appropriate information will be preserved as records to support mission and business needs.

Creator's Mandate & Functions
A-0
The authority given to a agency to administer a matter and all of the activities to aimed to accomplish one purpose, considered abstractly.

Creator's Organizational Structure
A-0
The way that an agency is organized to accomplish its functions.

DESTROY WORKING DOCUMENTS
A0 (A4)
Change the characteristics of temporary working documents so the information is not retrievable.

Destroyed Working Documents
A0
Working documents which no longer exist.

Disposition
Not on model
A term which denotes transfer and/or destruction.

Document
Not on model
Recorded information, regardless of physical form or characteristics.

External Regulations
A-0 / A0 / A1 / A2
Guidance from the organizations of the Office of the President, Office of Management and Budget (OMB), National Archives and Records Administration (NARA), General Services Administration (GSA), General Accounting Office (GAO), Department of Justice (DOJ), etc.

Facilities
A-0 / A0 / A1 / A2
Places where documents and records are created and stored. This includes current files areas, holding/staging areas, and record centers.

Human Resources
A-0 / A0 / A1 / A2
People.

Implementation Guidelines
A-0 / A0
Regulatory instruments initiated by the defense agencies such as regulations, letters, etc.

Information
A-0 / A0 / A1
Information is facts or data communicated or received. Upon receipt by the action officer it may become a record.

Laws
A-0
Legislation.

MAINTAIN WORKING DOCUMENTS
A0 (A2)
Any action taken to administer and preserve a working document during its life cycle.

MAKE RECORDS
A0 (A1)
The process of collecting, organizing, and recording information on the appropriate media to document the agency's business, determining whether information is record or nonrecord material, categorizing by disposition schedule, and indexing for retrieval.

MAKE DOCUMENTS
A1 (A12)
Generating new documents, in any media, by the internal processes of an agency.

Nonrecord Materials
A0 / A1 / A2
Any information that the action officer is not required to manage as a record, e.g., copies of organizational records, superfluous material such as envelope material, publications, reference materials, and copies of work in progress.

Organizational Records
A-0 / A0 / A1
Records related to the tasks, functions, mission, or operation of an office. These are divided into two subgroups, administrative and program records.

Persons' Actions
A-0 / A0 / A1
Conscious exercise of the will aimed to create, maintain, modify, or extinguish situations. A transaction is one type of act.

Policies, Procedures, and Rules
A-0
Detailed methods for managing records that are prescribed at various levels in each Component (Army, Navy, Air Force, Defense Agencies).

RECEIVE DOCUMENTS
A1 (A11)
To acquire recorded information from external sources.

Received Documents
A1
Recorded information acquired from external sources and not yet evaluated for record or nonrecord status.

Records
Not on model
Information, regardless of medium, detailing the transaction of business.
[Previous definition was similar to NARA's: Records includes all books, papers, maps, photographs, machine readable materials, and other documentary materials, regardless of physical form or characteristics, made or received by an office in connection with the transaction of official business and preserved or appropriate for preservation by that office as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of that office or because of the value of data in the record.]

Records Handling Tools
A-0 / A0 / A1 / A2
Hardware, software, and other devices used to manage records throughout their life cycle.

Records to be Coded
A1
A collection of record material (including original thought) organized as defined by the business processes of the office that has not been tagged with indices or disposition

Requests for Information
A0 / A2
Expressed needs or desires for information which is expected to be contained in Government records.

Requests for Copies of Organizational Records
A-0 / A0 / A2
Instances of asking for copies of organizational records. The action officer is not able to access original organizational records; rather action officer may obtain copies to get information the records contain.

Records Schedules
A0 / A1
The legal authority establishing the length of time a record must be kept before it is transferred or destroyed (permanent records are not authorized for destruction).

RETRIEVE DOCUMENTS
A2 (A23)
To identify and/or remove a document from a storage system.

Retrieved Information
A0 / A2
Information, regardless of media, that can be found easily through the use of standardized approaches including cataloging and indexing techniques.

Retrieved Working Documents
A0 / A2
Working documents that are removed from files.

SCREEN DOCUMENTS
A2 (A22)
Search for documents because of the information in them or to respond to authoritative requests for specific documents.

Selected Documents
A2
Documents identified as a result of a search using a given set of criteria.

SET ASIDE
A1 (A11)
To retain the document for action (i.e., transfer, respond, forward) or reference and to decide whether the document is a record or nonrecord material.

STORE WORKING DOCUMENTS
A2 (A21)
To retain working documents in an organized manner for purpose of (safeguarding and) preserving information throughout its life cycle and for ease of retrieval.

Stored Working Documents
A2
Working documents organized for ease of retrieval and for preservation throughout their life cycle.

TRANSFER WORKING DOCUMENTS
A0 (A3)
To move working records from one action officer or analyst to another.

Transferred Working Documents
A-0, A0
Records moved from one action officer or analyst to another.

Working Documents
Not on model
Nonrecord materials that the person uses in the conduct of business.

2.5 Changes from Original Function Model

2.5.1 Reduction of Scope to Creation

The original report incorporated the three major activities of records management: creation, maintenance, and disposition. The new edition concentrates on creation but omits maintenance and disposition of organizational records because most people do not perform those functions. This change brings the model into the original intent of the FPI effort[1].

[1] DoD RM FPI Scoping Session (Report), October 1, 1993

2.5.2 Primary Output

The primary output of the original model was "retrievable information." The title and definition were meant to emphasize that the reason for records keeping is to be able to locate information when needed. This concept still applies, however, the new model indicates that the location for storage of records (that is, retrievable information) is outside the realm of the average DoD person. Consequently the new model outputs "organizational records" to a repository and retrieves "copies of organizational records" from the repository when needed.

2.5.3 Other Outputs

"Destroyed records" was an output on the original model — a symbol of records that no longer exist. "Transferred records" were bundled into "retrievable information" because the information in them could still be obtained. In the new model, the person neither destroys nor transfers organizational records. The person may transfer or destroy working documents and the model reflects this. Note, however, the output "destroyed working documents" is tunneled at a lower level than the context diagram to indicate that this is much less significant than other outputs and that these are not organizational records but are copies and working papers used by the person.

2.5.4 Greater Treatment of Nonrecord Material

On the original model, "nonrecord material" was de-emphasized by tunneling it as an output on the A0 diagram immediately after it came into being. In the current model the nonrecord materials or working documents are the model objects most used by the person and processed in functions A2, A3, and A4.

2.5.5 Persons' Actions

On the original model, the only inputs were raw information and requests for information. Action internally generated in the MAKE RECORDS function. The current model follows the archival science notion that records document an action taken by a person. Thus the current model has two inputs. Information (usually in document form) can be received. Received documents and persons' actions can cause the making of new documents, some of which are transformed into records.

2.5.6 Communication with a Records Storage Repository

On the original model, "retrievable information" was extracted from the records in maintenance. While the concept is still true, the records in maintenance are no longer considered to be within the domain of the person. Rather in the current model the person must request copies of organizational records (after using finding aids, indexes, and even viewing the records) and then receive copies with which to work.[2]

2.5.7 More Comprehensive List of Controls

The original four controls have been expanded to six with the addition of "creator's mandate and functions" and "creator's organizational structure." In this context the creator is the agency.

[2] Prescott, Underwood, Kindl, *Functional Baseline Requirements and Data Elements for Records Management Software*, August 28, 1995, Army Research Laboratory, Software Technology Branch.

3 Records Management Information Model, 2003

3.1 Overview of Information Models

The reader is invited to read Appendix B, Reader's Guide to IDEF1X Information Models, before reviewing the information model in this section. The U.S. government standard for IDEF1X information models is published in the FIPS 184.

Information models capture the conceptual view of information across an enterprise. The only practical way to share information across a large enterprise is to construct and use a conceptual information model. The models capture three basic types of information:

Entities

Each entity is a set of similar things about which the enterprise should keep information. Each instance of an entity must have a unique identification so the enterprise can distinguish one instance from another.

Entities are represented on the model by rectangles, with corners featuring either right angles or a rounding.

Attributes

Characteristics of the entities.

Some attributes serve to uniquely identify the entities (key attributes). Other attributes capture additional information abut the entities (non-key attributes).

Attributes are represented on the model by text lines within entity boxes.

Relationships

How entities affect one another.

Relationships are the basis for the construction of relational data bases.

Relationships are represented on the model by solid or dashed lines, each relationship connecting two entity boxes.

Symbols at the relationship-entity joinings indicate how many instances of each entity are affected by or affect how many instances of the other entity in the relationship. The name of this concept is cardinality.

Two related entities, a verb phrase describing the relationship, and the cardinalities constitute a "business rule."

Again, Appendix B and FIPS 184 provide greater detail about information model concepts and rules.

3.2 Highlights of the DoD Records Management Information Model

3.2.1 RECORD

The main entity is RECORD. A RECORD is the "Information detailing the business of the government[1]. A transaction is a type of RECORD."

The key attributes of RECORD are:

- RECORD-Provenance-ORGANIZATION_Identifier. This is the unique identifier of the agency that creates a record either from a newly created or newly received document.

- RECORD-Identifier. This is a unique identifier the agency gives to each instance of the entity RECORD.

Non-key attributes of RECORD include:

- RECORD_Creation_Date
- RECORD_Creation_Time
- RECORD_Disposition_Date
- RECORD_Media_Code
- RECORD_Access_Code
- RECORD_Subject_Text
- RECORD_Form_Code

[1] U.S. DoD RM Task Force Implementation Data Standardization Report - Update 1, June 10, 1995, A-2, Att-4

3.2.2 RECORD-CATEGORY

ORGANIZATIONs, such as the U.S. government and its subordinate agencies, officially decide and publish RECORD-CATEGORY(ies) that delineate what RECORDS should be created and how and for how long they should be kept. The RECORD-CATEGORY describes each series of RECORD and associates it with the appropriate disposition instruction.

3.2.3 RECORD-ASSOCIATION

RECORDS may relate to one another in significant ways. Two of the most common are as attachment to another RECORD and as a part of a case file (dossier) RECORD. This associative entity records the association, the reason, and the effective date.

3.2.4 RECORD-STATUS

The RECORD-STATUS entity allows the keeping of information about the current and historical development of the RECORD or of the transaction that the RECORD depicts. (The next step in the development of this entity is to define the values for the attribute RECORD-STATUS-Code.)

3.2.5 ORGANIZATION

The ORGANIZATION provides part of the identification of RECORD. The associative entity RECORD-ORGANIZATION permits the keeping of many other types of links between RECORD and ORGANIZATION. The associative entity ORGANIZATION-POSITION permits keeping a reference to all who authenticated a document.

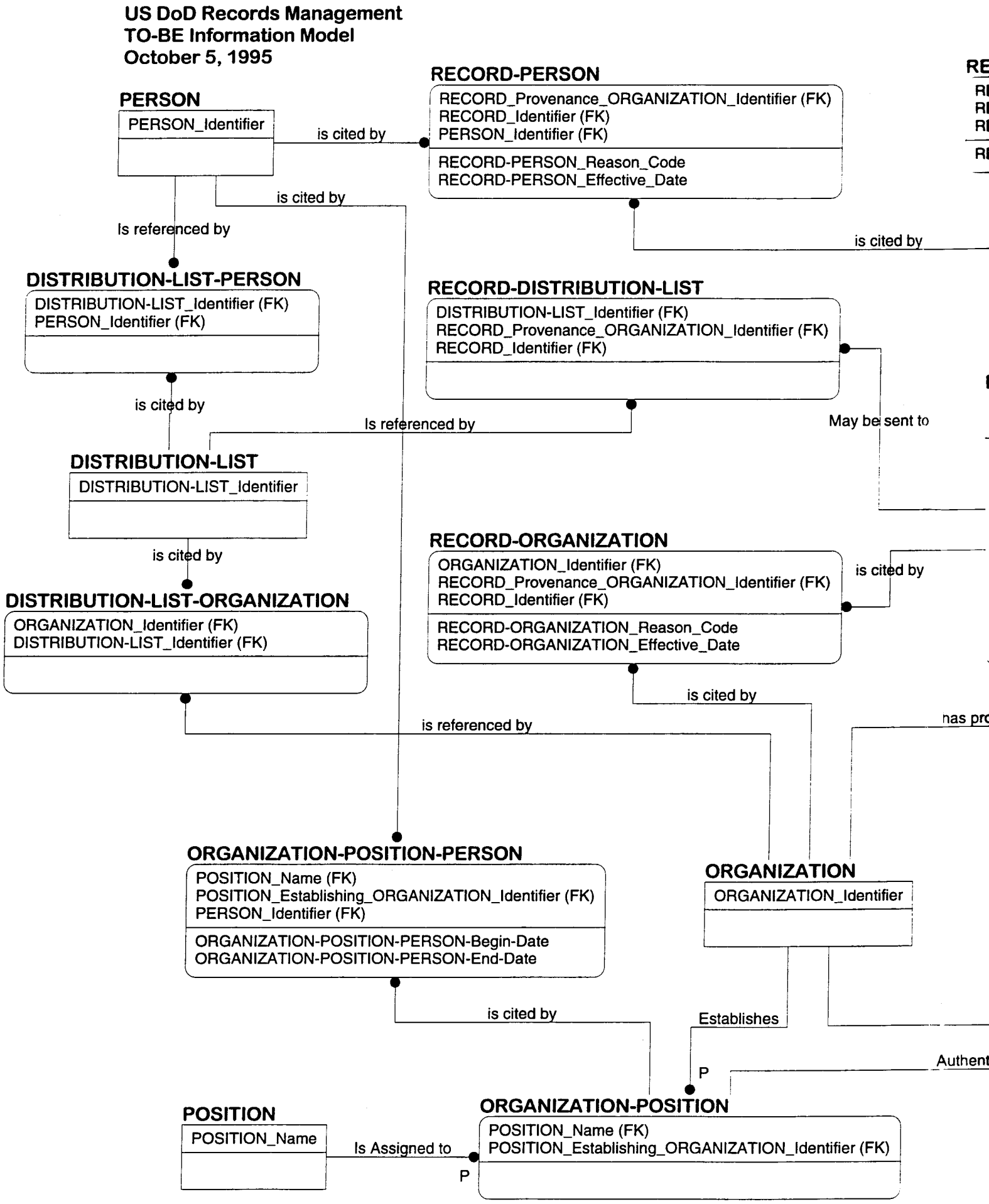
3.2.6 DISTRIBUTION LIST

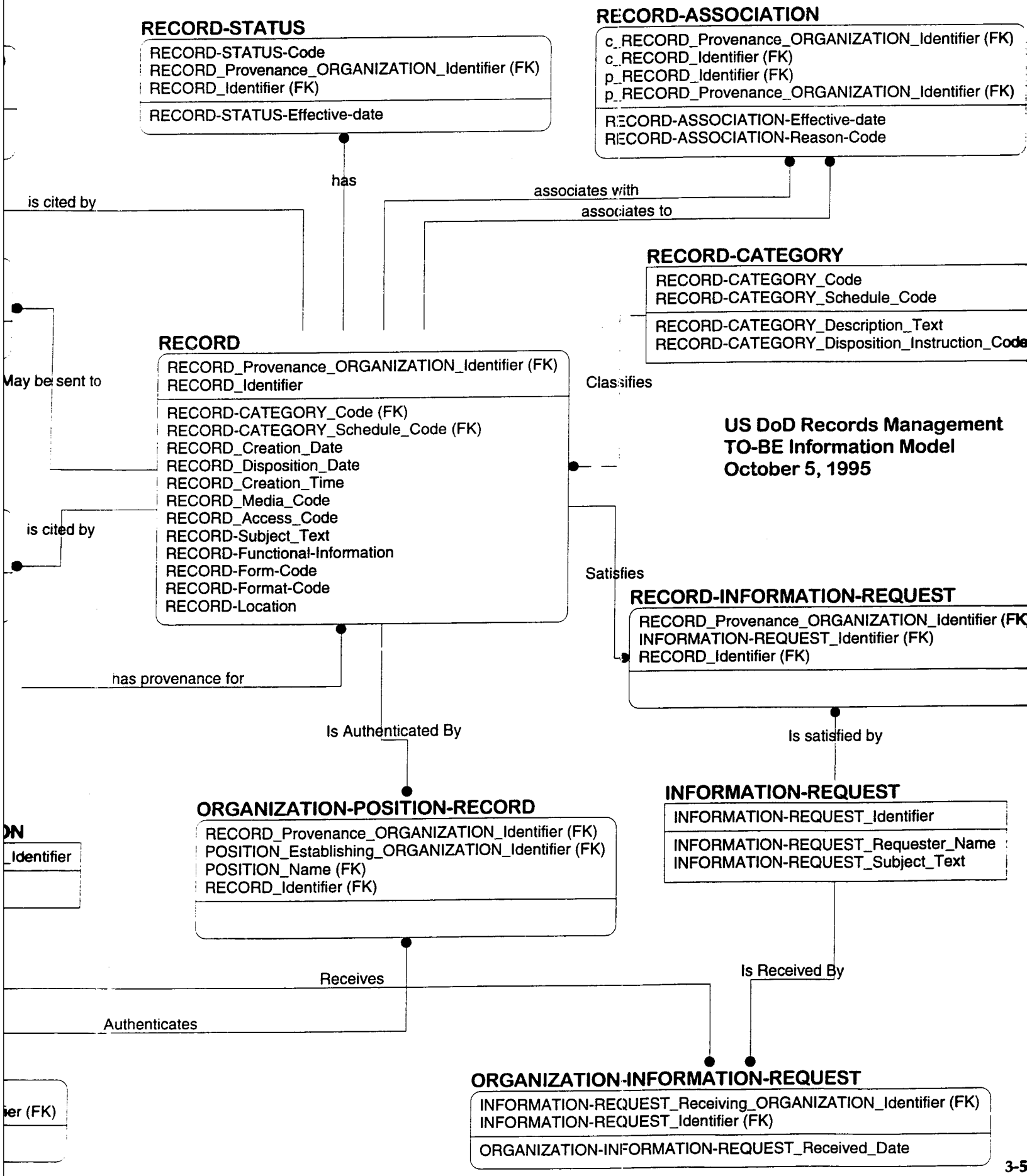
Distribution lists are convenient tools to shorten the address portion of communication type records. The associative entity RECORD-DISTRIBUTION LIST tracks every instance of a DISTRIBUTION LIST being used on a RECORD. The associative entities DISTRIBUTION LIST-PERSON and DISTRIBUTION LIST-ORGANIZATION link every PERSON and every ORGANIZATION with every DISTRIBUTION LIST on which they occur.

3.2.7 INFORMATION-REQUEST

An INFORMATION REQUEST is an asking for information thought to be contained within one or more RECORDs. The associative entities ORGANIZATION-INFORMATION REQUEST and RECORD-INFORMATION REQUEST permit the keeping of information about multiple combinations of ORGANIZATIONs, RECORDs, and INFORMATION REQUESTs.

3.3 Diagrams


US DoD Records Management
TO-BE Information Model
October 5, 1995
PERSON
PERSON_Identifier
is cited by
RECORD-PERSON
RECORD_Provenance_ORGANIZATION_Identifier (FK)
RECORD_Identifier (FK)
PERSON_Identifier (FK)
RECORD-PERSON_Reason_Code
RECORD-PERSON_Effective_Date
is cited by
Is referenced by
is cited by
DISTRIBUTION-LIST-PERSON
DISTRIBUTION-LIST_Identifier (FK)
PERSON_Identifier (FK)
RECORD-DISTRIBUTION-LIST
DISTRIBUTION-LIST_Identifier (FK)
RECORD_Provenance_ORGANIZATION_Identifier (FK)
RECORD_Identifier (FK)
is cited by
Is referenced by
May be sent to
DISTRIBUTION-LIST
DISTRIBUTION-LIST_Identifier
is cited by
RECORD-ORGANIZATION
ORGANIZATION_Identifier (FK)
RECORD_Provenance_ORGANIZATION_Identifier (FK)
RECORD_Identifier (FK)
RECORD-ORGANIZATION_Reason_Code
RECORD-ORGANIZATION_Effective_Date
is cited by
DISTRIBUTION-LIST-ORGANIZATION
ORGANIZATION_Identifier (FK)
DISTRIBUTION-LIST_Identifier (FK)
is cited by
is referenced by
has pro
ORGANIZATION-POSITION-PERSON
POSITION_Name (FK)
POSITION_Establishing_ORGANIZATION_Identifier (FK)
PERSON_Identifier (FK)
ORGANIZATION-POSITION-PERSON-Begin-Date
ORGANIZATION-POSITION-PERSON-End-Date
ORGANIZATION
ORGANIZATION_Identifier
is cited by
Establishes
Authent
P
POSITION
POSITION_Name
Is Assigned to
P
ORGANIZATION-POSITION
POSITION_Name (FK)
POSITION_Establishing_ORGANIZATION_Identifier (FK)


RECORD-STATUS
RECORD-STATUS-Code
RECORD_Provenance_ORGANIZATION_Identifier (FK)
RECORD_Identifier (FK)
RECORD-STATUS-Effective-date
RECORD-ASSOCIATION
c_RECORD_Provenance_ORGANIZATION_Identifier (FK)
c_RECORD_Identifier (FK)
p_RECORD_Identifier (FK)
p_RECORD_Provenance_ORGANIZATION_Identifier (FK)
RECORD-ASSOCIATION-Effective-date
RECORD-ASSOCIATION-Reason-Code
has
associates with
associates to
is cited by
RECORD-CATEGORY
RECORD-CATEGORY_Code
RECORD-CATEGORY_Schedule_Code
RECORD-CATEGORY_Description_Text
RECORD-CATEGORY_Disposition_Instruction_Code
RECORD
RECORD_Provenance_ORGANIZATION_Identifier (FK)
RECORD_Identifier
RECORD-CATEGORY_Code (FK)
RECORD-CATEGORY_Schedule_Code (FK)
RECORD_Creation_Date
RECORD_Disposition_Date
RECORD_Creation_Time
RECORD_Media_Code
RECORD_Access_Code
RECORD-Subject_Text
RECORD-Functional-Information
RECORD-Form-Code
RECORD-Format-Code
RECORD-Location
May be sent to
Classifies
US DoD Records Management
TO-BE Information Model
October 5, 1995
is cited by
Satisfies
RECORD-INFORMATION-REQUEST
RECORD_Provenance_ORGANIZATION_Identifier (FK
INFORMATION-REQUEST_Identifier (FK)
RECORD_Identifier (FK)
has provenance for
Is Authenticated By
Is satisfied by
INFORMATION-REQUEST
INFORMATION-REQUEST_Identifier
INFORMATION-REQUEST_Requester_Name
INFORMATION-REQUEST_Subject_Text
ORGANIZATION-POSITION-RECORD
RECORD_Provenance_ORGANIZATION_Identifier (FK)
POSITION_Establishing_ORGANIZATION_Identifier (FK)
POSITION_Name (FK)
RECORD_Identifier (FK)
Receives
Is Received By
Authenticates
ORGANIZATION-INFORMATION-REQUEST
INFORMATION-REQUEST_Receiving_ORGANIZATION_Identifier (FK)
INFORMATION-REQUEST_Identifier (FK)
ORGANIZATION-INFORMATION-REQUEST_Received_Date

3.4 Relationship Report

This section provides in "English language" format all the relationships from the information model.

On the graphical model:

- Relationships are shown as solid or dashed lines between entity boxes. Solid lines represent identifying relationships; dashed lines represent non-identifying relationships.

- Cardinality is indicated by symbols at the ends of the lines. When the line directly intersects the entity box without any symbol, the cardinality is "one" at that end of the relationship.

- The business rules are provided by the verb phrase labels on the relationship lines. On the model these are written in the parent to child direction. One may read the relationship in the opposite direction by changing the verb phrase as appropriate.

Relationship Type: If a relationship is identifying, the key attributes of the parent migrate to be part of the set of key attributes of the child entity. If a relationship is non-identifying, the key attributes of the parent migrate to be part of the non-key attributes of the child entity. Migrated attributes are indicated on the information model diagram by a Function Key (FK) to the right of the attribute name.

Each table below uses two rows to describe each relationship. The first row reads the relationship from the parent entity to the child entity. The second row expresses the same relationship as read from the child entity to the parent. The terms in the table are derived from a model report and are a bit stilted. The reader can covert the table contents to proper English language.

For example, the first relationship table below is equivalent to this paragraph,

> "This is an identifying relationship. 'One ORGANIZATION-POSITION authenticates zero, one, or more ORGANIZATION-POSITION-RECORD(s).' The reverse reads, 'Zero, one, or more ORGANIZATION-POSITION-RECORD(s) is(are) authenticated by one ORGANIZATION-POSITION.'"

Relationship Type	Cardinality	First Entity	Verb Phrase	Cardinality	Second Entity
Identifying	One	ORGANIZATION-POSITION	authenticates	Zero-One-or-More	ORGANIZATION-POSITION-RECORD
Reverse reading	*Zero-One-or-More*	*ORGANIZATION-POSITION-RECORD*	*is authenticated by*	*One*	*ORGANIZATION-POSITION*
Non-identifying	One	RECORD-CATEGORY	classifies	Zero-One-or-More	RECORD
Reverse reading	*Zero-One-or-More*	*RECORD*	*is classified as*	*One*	*RECORD-CATEGORY*
Identifying	One	ORGANIZATION	establishes	One-or-More	ORGANIZATION-POSITION
Reverse reading	*One-or-More*	*ORGANIZATION-POSITION*	*is established by*	*One*	*ORGANIZATION*
Identifying	One	POSITION	is assigned to	One-or-More	ORGANIZATION-POSITION
Reverse reading	*One-or-More*	*ORGANIZATION-POSITION*	*has assigned*	*One*	*POSITION*

Relationship Type	Cardinality	First Entity	Verb Phrase	Cardinality	Second Entity
Identifying	One	RECORD	is authenticated By	Zero-One-or-More	ORGANIZATION-POSITION-RECORD
Reverse reading	*Zero-One-or-More*	*ORGANIZATION-POSITION-RECORD*	*authenticates*	*One*	*RECORD*
Identifying	One	INFORMATION-REQUEST	is received by	Zero-One-or-More	ORGANIZATION-INFORMATION-REQUEST
Reverse reading	*Zero-One-or-More*	*ORGANIZATION-INFORMATION-REQUEST*	*receives*	*One*	*INFORMATION-REQUEST*
Identifying	One	DISTRIBUTION-LIST	is referenced by	Zero-One-or-More	RECORD-DISTRIBUTION-LIST
Reverse reading	*Zero-One-or-More*	*RECORD-DISTRIBUTION-LIST*	*references*	*One*	*DISTRIBUTION-LIST*

Relationship Type	Cardinality	First Entity	Verb Phrase	Cardinality	Second Entity
Identifying	One	PERSON	is referenced by	Zero-One-or-More	DISTRIBUTION-LIST-PERSON
Reverse reading	*Zero-One-or-More*	*DISTRIBUTION-LIST-PERSON*	*references*	*One*	*PERSON*
Identifying	One	INFORMATION-REQUEST	is satisfied by	Zero-One-or-More	RECORD-INFORMATION-REQUEST
Reverse reading	*Zero-One-or-More*	*RECORD-INFORMATION-REQUEST*	*satisfies*	*One*	*INFORMATION-REQUEST*
Identifying	One	RECORD	may be sent to	Zero-One-or-More	RECORD-DISTRIBUTION-LIST
Reverse reading	*Zero-One-or-More*	*RECORD-DISTRIBUTION-LIST*	*cites*	*One*	*RECORD*

Relationship Type	Cardinality	First Entity	Verb Phrase	Cardinality	Second Entity
Identifying	One	ORGANIZATION	receives	Zero-One-or-More	ORGANIZATION-INFORMATION-REQUEST
Reverse reading	*Zero-One-or-More*	*ORGANIZATION-INFORMATION-REQUEST*	*cites*	*One*	*ORGANIZATION*
Identifying	One	RECORD	satisfies	Zero-One-or-More	RECORD-INFORMATION-REQUEST
Reverse reading	*Zero-One-or-More*	*RECORD-INFORMATION-REQUEST*	*is satisfied by*	*One*	*RECORD*
Identifying	One	RECORD	associates to	Zero-One-or-More	RECORD-ASSOCIATION
Reverse reading	*Zero-One-or-More*	*RECORD-ASSOCIATION*	*associates to*	*One*	*RECORD*

Relationship Type	Cardinality	First Entity	Verb Phrase	Cardinality	Second Entity
Identifying	One	RECORD	associates with	Zero-One-or-More	RECORD-ASSOCIATION
Reverse reading	*Zero-One-or-More*	*RECORD-ASSOCIATION*	*associates with*	*One*	*RECORD*
Identifying	One	RECORD	has	Zero-One-or-More	RECORD-STATUS
Reverse reading	*Zero-One-or-More*	*RECORD-STATUS*	*describes*	*One*	*RECORD*

Relationship Type	Cardinality	First Entity	Verb Phrase	Cardinality	Second Entity
Identifying	One	ORGANIZATION	has provenance for	Zero-One-or-More	RECORD
Reverse reading	*Zero-One-or-More*	*RECORD*	*is within provenance of*	*One*	*ORGANIZATION*
Identifying	One	DISTRIBUTION-LIST	is cited by	Zero-One-or-More	DISTRIBUTION-LIST-ORGANIZATION
Reverse reading	*Zero-One-or-More*	*DISTRIBUTION-LIST-ORGANIZATION*	*cites*	*One*	*DISTRIBUTION-LIST*
Identifying	One	DISTRIBUTION-LIST	is cited by	Zero-One-or-More	DISTRIBUTION-LIST-PERSON
Reverse reading	*Zero-One-or-More*	*DISTRIBUTION-LIST-PERSON*	*cites*	*One*	*DISTRIBUTION-LIST*
Identifying	One	ORGANIZATION	is cited by	Zero-One-or-More	RECORD-ORGANIZATION
Reverse reading	*Zero-One-or-More*	*RECORD-ORGANIZATION*	*cites*	*One*	*ORGANIZATION*

Relationship Type	Cardinality	First Entity	Verb Phrase	Cardinality	Second Entity
Identifying	One-	RECORD	is cited by	Zero- One- or- More	RECORD- ORGANIZATION
Reverse reading	*Zero- One- or- More*	*RECORD- ORGANIZATION*	*cites*	*One-*	*RECORD*
Identifying	One	ORGANIZATION	is referenced by	Zero- One- or- More	DISTRIBUTION- LIST- ORGANIZATION
Reverse reading	*Zero- One- or- More*	*DISTRIBUTION- LIST- ORGANIZATION*	*references*	*One*	*ORGANIZATION*

3.5 Glossary

c_RECORD_Identifier
The role name, built upon record identifier, that provides part of the key attribute for the instance of record that serves as the child in the associative entity, record-association.

c_RECORD_Provenance_ORGANIZATION_Identifier
The role name, built upon record provenance organization identifier, that provides part of the key attribute for the instance of record that serves as the child in the associative entity, record-association.

DISTRIBUTION-LIST
A collection of addressee information. (Note 3)

DISTRIBUTION-LIST-Identifier
The identifier that represents a distribution list. (Note 3)

DISTRIBUTION-LIST-PERSON
An associative entity that links a distribution list with a person. (Note 3)

Fonds
The whole of the records that an organization accumulates by reason of its function or activity. (Note 1)

Information (from IDEF0 TO-BE model)
Information is facts or data communicated or received. Upon receipt by the action officer it may become a record. (Note 1)

INFORMATION-REQUEST
Expressed needs or desires for information that is expected to be contained in government records. (Note 3)

INFORMATION-REQUEST_Identifier
The identifier that represents a particular INFORMATION REQUEST. (Note 3)

INFORMATION-REQUEST_Receiving_ORGANIZATION_Identifier.ORGANIZATION_Identifier
The identifier that represents an ORGANIZATION (that receives an INFORMATION-REQUEST). (Note 3)

INFORMATION-REQUEST_Requester_Name
The name of the requester that is associated with a particular INFORMATION-REQUEST. (Note 3)

INFORMATION-REQUEST_Subject_Text
The text of the subject associated with a particular INFORMATION REQUEST. (Note 3)

Manage Records (from IDEF0 TO-BE model- Scope of this model) Manage the life cycle of records, including the creation, maintenance (use, storage, retrieval), and disposition, regardless of media. (Note 1)

ORGANIZATION
An administrative structure with a mission. (DoD Enterprise Model)

ORGANIZATION_Identifier
The identifier used to designate an ORGANIZATION. (DoD Enterprise Model)

ORGANIZATION-INFORMATION-REQUEST
An association between an ORGANIZATION and an INFORMATION-REQUEST. (Note 3)

ORGANIZATION-INFORMATION-REQUEST_Received_Date
The date that a particular INFORMATION-REQUEST is received at an ORGANIZATION. (Note 3)

ORGANIZATION-POSITION
An associative entity that connects an ORGANIZATION with the POSITIONs within it. (Note 3)

ORGANIZATION-POSITION-PERSON
An associative entity that links an organization-position with a person.

ORGANIZATION-POSITION-PERSON_Begin Date
The date that an organization-position-person association starts.

ORGANIZATION-POSITION-PERSON_End_Date
The date an organization-position-person association terminates.

ORGANIZATION-POSITION-RECORD
The associative entity that resolves the non-specific relationship between ORGANIZATION-POSITION and RECORD. (Note 2)

p_RECORD_Identifier
The role name, built upon record identifier, that provides part of the key attribute for the instance of record that serves as the parent in the associative entity, record-association.

p_RECORD_Provenance_ORGANIZATION_Identifier
The role name, built upon record provenance organization identifier, that provides part of the key attribute for the instance of record that serves as the parent in the associative entity, record-association.

PERSON
A human being. (DoD Enterprise Model)

PERSON_Identifier
The identifier that represents a PERSON. (DoD Enterprise Model)

POSITION
Particular duty, function, or authority associated with an organization. Records are authenticated based upon the authority inherent in the position. (Note 3)

POSITION_Name
The name assigned to a position within the organization. (Note 3)

POSITION_Establishing_ORGANIZATION_Identifier.ORGANIZATION_Identifier
The identifier that represents an ORGANIZATION (that has established a POSITION). (Note 3)

Provenance
The organization creating a fonds. (Note 1)

RECORD
The information documenting the transaction of business.

RECORD_Access_Code
The code that denotes who may see the RECORD. (Note 3)

RECORD-ASSOCIATION
An associative entity that links one instance of record with another.

RECORD-ASSOCIATION_Effective_Date
The date that a record association begins.

RECORD-ASSOCIATION_Reason_Code
The code that reflects the manner in which one record relates to another.

RECORD-CATEGORY
The description of a particular type of record.

RECORD-CATEGORY_Code
The code that represents a RECORD-CATEGORY.

RECORD-CATEGORY_Description_Text
The text of a description of a RECORD-CATEGORY.

RECORD-CATEGORY_Disposition_Instruction_Code
The CODE that represents the instruction for the handling of a record.

RECORD-CATEGORY_Schedule_Code
The code that represents a record schedule.

RECORD_Creation_Date
The date the information becomes a RECORD.

RECORD_Creation_Time
The time that the information becomes a RECORD.

RECORD_Disposition_Date
The date of a RECORD disposition.

RECORD-DISTRIBUTION-LIST
An associative entity that links a record with its distribution list(s). (Note 2)

RECORD_Form_Code
The code that represents the generic layout used to present the information, independent of the media or access level. Examples include letter, memorandum, message.

RECORD_Format_Code
The code that represents the logical structure of the record. For automated records this is the applications software needed to view the record in its original form.

RECORD_Functional_Information
A "place holder" attribute indicating the portion of the record that contains informational or historical value other than the attributes that uniquely identify the record or serve other RM purposes. Examples: The body of a letter, the photo portion of a patient's X-ray, the description of an accident in an accident report. (Notes 3 & 4)

RECORD_Identifier
The identifier that represents a RECORD.

RECORD-INFORMATION-REQUEST
An associative entity that specifically relates INFORMATION REQUEST from within or outside the ORGANIZATION to a RECORD that satisfies the request. (Note 2)

RECORD_Location
A specific place. In this context, a pointer to the record that contains information other than the attributes that uniquely identify the record or serve other RM purposes. Examples: an operating system path-file name, the location of a file cabinet, and the location of a magnetic tape rack.

RECORD_Provenance_ORGANIZATION_Identifier.ORGANIZATION_Identifier
The identifier that represents an organization (that has provenance for the RECORD).

RECORD_Media_Code
The code that represents the form of a RECORD. (Note 2)

RECORD-ORGANIZATION
An associative entity that links a record with an organization.

RECORD-ORGANIZATION_Effective Date
The date that a record-organization association begins.

RECORD-ORGANIZATION_Reason_Code
The code that represents why a record and an organization are related.

RECORD-PERSON
An associative entity that links a record with a person.

RECORD-PERSON_Effective Date
The date that a record-person association begins.

RECORD-PERSON_Reason_Code
The code that represents why a record and a person are related.

RECORD-STATUS
The life cycle related condition that affects implementation of disposition instructions for a record. Examples include active, cut off, and "freeze."

RECORD-STATUS_Code
The code that reflects the record status of a record.

RECORD-STATUS_Effective_Date
The date that a record status becomes effective for a record.

RECORD_Subject_Text
The text that describes the main topic of a record.

Note 1: Provided for reference.

Note 2: The RM community will propose data standards later.

Note 3: Records management is not the custodian for this entity or attribute that is included in the RM TO-BE model for completeness. The definition is as viewed by the RM function. This definition has not yet been coordinated with the custodian of this data.

Note 4: Indicates a data type; not a specific data element.

3.6 Changes from Original Information Model

3.6.1 Changed "RECORD_Maintaining_ORGANIZATION_Identifier" to "RECORD_Provenance_ORGANIZATION _Identifier."

The term "maintaining" has several meanings and thereby caused confusion. For example, the three stages of the life cycle of records are creation, maintenance and use, and disposition. Therefore, some consider maintenance only as storage, retrieval, and handling. Others equate maintenance with physical custody rather than with legal custody which may be entrusted to a different organization. The word "provenance" in this context means the organization that has created or received a document and sets it aside to be a RECORD.

3.6.2 Added RECORD-ASSOCIATION

RECORD-ASSOCIATION replaces the more restrictive RECORD-ATTACHMENT. RECORD-ASSOCIATION provides the ability to keep information about attachments, case files (dossiers), and any other relationships among RECORDs.

3.6.3 Added RECORD-STATUS

RECORD-STATUS allows keeping information about the status of the RECORD life cycle (e.g., active, cutoff).

3.6.4 Delete ADDRESSEE and SENDER

The intent of ADDRESSEE and SENDER was to kept track of each. These were awkward entities because either could be a PERSON or an ORGANIZATION, depending upon the individual communication. The model now provides information about the ORGANIZATION or PERSON that sends or receives a RECORD, the DISTRIBUTION LIST that receives a RECORD, and the ORGANIZATION-POSITION that authenticates a RECORD.

3.6.5 Added ORGANIZATION-RECORD

The original model provided three specific relationships between RECORD and ORGANIZATION: "maintains," "creates," and "is transfer destination of." The new model replaces the identifying "maintains" relationship with the "has provenance for" relationship, as discussed above. The new model also replaces the "creates" and "is transfer destination of" relationships with the more flexible RECORD-ORGANIZATION entity and its reason code and "is cited by" relationship to RECORD.

3.6.6 Added PERSON

PERSON was not on the original model. On the new model its purposes are to identify the people on DISTRIBUTION-LISTs and in ORGANIZATION-POSITIONs. The associate entity RECORD-PERSON and its reason code provide flexibility to link people with records.

3.7 Implementation of Indexing

The DoD RM information model implements the indexing requirements proposed in the document Functional Baseline Requirements and Data Elements for RM Application Software, published by the Army Research Laboratory, Software Technology Branch, August 28, 1995. The matrix below explains how the requirements are met. The left column below states the requirement and the middle column proposes a data element name, both from paragraph 3.3 of the baseline requirements report. The right column below describes how the requirement is accomplished on the DoD RM information model.

Functional Baseline Requirements and Data Elements for Records Management Application Software	DoD RM Information Model

Requirement	Proposed Data Element Name	How Implemented
Record Identifier	RECORD_Identifer	RECORD_Identifer & RECORD_Provenance_ ORGANIZATION_Identifier
Classification Code	RECORD_Classification_ Code	RECORD-CATEGORY_ Code & RECORD-CATEGORY_ Schedule_Code
Creating Individual	RECORD_Creating_Individual_ Text	RECORD-PERSON entity & RECORD-PERSON-Reason-Code
Creating Organization	RECORD_Creating_Organization _Text	RECORD-ORGANIZATION entity & RECORD-ORGANIZATION -Reason-Code
Subject	RECORD_Subject_Text	RECORD_Subject_Text
Media Type	RECORD_Media_Code	RECORD_Media_Code
Date of the Record	RECORD_Created_Date	RECORD_Creation_Date
Addressee(s)	RECORD_Addressee-Text	RECORD-ORGANIZATION entity & RECORD-ORGANIZATION -Reason-Code RECORD-PERSON entity & RECORD-PERSON-Reason-Code
Location of the Record	RECORD_Location	RECORD_Location
Record Format	RECORD-Format-Code	RECORD-Format-Code

Appendix A - Reader's Guide to IDEF0 Function Models

A.1 Activity Model Overview

A function (or activity or process) model is a graphic representation of an enterprise's functions within a defined scope. The purposes of the function model are to describe the functions and processes, assist with discovery of information needs, help identify improvement opportunities, and establish a basis for determining product and service costs. Function models are hierarchical models. The higher levels of a model depicts the activities or processes performed across a functional area. The lower levels depict how those processes are performed.

The standards for IDEF0 function models are published in the Federal Information Processing Standards (FIPS) Publication 183, Integration Definition for Function Modeling (IDEF0), December 21, 1993, published by the United States Department of Commerce, Technology Administration, National Institute of Standards and Technology. The DoD has chosen IDEF0 as its standard for function modeling in support of BPR.

A.2 Function Model Components

A.2.1 Function

A function is a named process, function, activity, or task that occurs over time and has some recognizable results. It is represented by a rectangular box with an enclosed verb phrase that describes the activity. A function represents some action that produces some result.

Functions are hierarchical. A function may be divided into more specific functions. Conversely, a function may be combined with several other functions under the heading of a more general function.

The hierarchy of functions of an IDEF0 model may be displayed in three ways:

- Node Tree Diagrams
- Indented Lists
- Context and Decomposition Diagrams

Node trees and indented lists (outlines) succinctly display the hierarchial nature of the functions. Context diagrams and decomposition diagrams include both activities in the hierarchal form (shown as boxes) and constraints (arrows) called "ICOMs."

Context Diagram
A context diagram shows a single activity with its associated ICOMs. Since the technique is hierarchial, a context diagram provides a framework for understanding the complete set of activities decomposed from it. The context diagram is the highest level of the diagram. The definition of its single function is the scope of the model. At this level the viewpoint and the purpose for constructing the model are stated.

Decomposition Diagram
Each function on the diagram may be described in more detail, by development on a separate, lower level diagram referred to as the decomposition diagram. This breaks down a complex activity into smaller, simpler, more detailed functions. Decomposition diagrams are displayed in landscape view; each diagram shows three to six functions arranged in a diagonal from upper left to lower right.

A.2.2 ICOM

ICOM is an abbreviation for Input, Control, Output, and Mechanism. It collectively refers to the constraining information flowing into or out of an activity and between activities.

Input	Information or material used by the activity to produce an activity output. Inputs may also trigger an activity to occur. (Enters a function box on the left.)
Control	Information or material that controls a function by specifying when or how a function will be carried out. (Enters a function box on the top.)
Output	Information or material produced by or resulting from an activity. (Exits a function box to the right.)

Mechanism Usually people, machines or systems that perform the activity. The energy necessary to conduct the activity. Unlike the input, the mechanism is not consumed in the production of the output.
(Enters a function box on the bottom.)

At the context diagram level, ICOMs enter and exit from beyond the scope of the model. Within the model outputs of one function may serve as inputs, controls, and mechanisms to other functions. ICOMs can divide from broad to more specific things or information.

A.2.3 Text

Every function and ICOM on a model must be uniquely named and defined. Terms are published in an alphabetically sequenced glossary. Each decomposition diagram may be accompanied by a text diagram that walks the reader through the main points of the diagram.

Appendix B - Reader's Guide to IDEF1X Information Models

B.1 Purpose of the Guide

This guide provides an overview of the essential components of the IDEF1X data modeling technique in sufficient detail so that reviewers can understand and "read" IDEF1X models. This guide is not intended to be used as an instructional course that would prepare users for model construction and BPR.

B.2 Purpose of the IDEF1X Technique

The principal objective of the IDEF1X technique is to support integration. Integration focuses on the capture, management, and use of single data definitions that can be shared and re-used. The single data definitions are graphically depicted in the models. The models are constructed in "neutral" terms (meaning they are unbiased towards any single end-user representation of data and independent of how the data is physically stored or accessed) and produce what is known as a "Conceptual Model." The conceptual model is derived from the notion of managing data from three viewpoints

- The External View/Schema presents data from the viewpoint of the user. As such the data is seen within the context of forms, reports, and computer screens.

- The Internal View/Schema is sometimes referred to as a computer view or physical view. It addresses data in forms such as file structures and data fields.

- The Conceptual View/Schema provides single integrated data definitions representing the business enterprise that are unbiased towards implementation technologies.

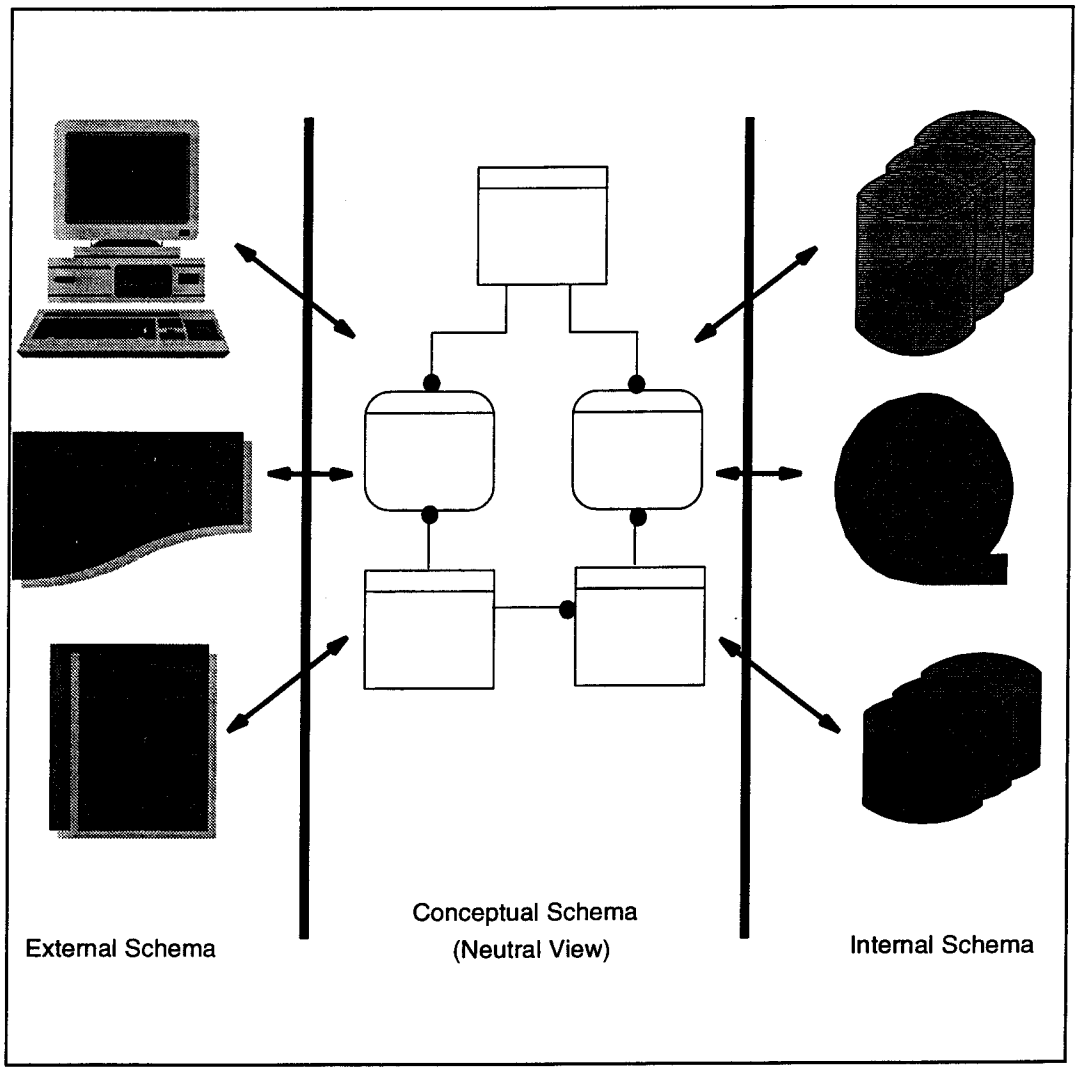


Figure 1- Three Schema Approach

The "Conceptual Model" provides consistency in the definition, the meanings and the inter-relationships of data. The model is used to integrate, share, and manage data resources. As such, the IDEF1X modeling technique serves as the foundation for all DoD data standardization and integration activities. The objectives of the IDEF technique are:

- To provide a means for completely understanding and analyzing an organization's data resources.
- To provide a common means of representing and communicating the complexity of data.
- To provide a method for presenting an overall view of the data required to run an enterprise.

- To provide a means for defining application-independent view of data which can be validated by users and transformed into physical database design.

- To provide a method for deriving an integrated data definition from existing data resources.

B.3 Key Components/Concepts & Definitions

This section presents the semantics (or meanings) of each IDEF1X model component, the graphical syntax for representing the component, and the rules for governing its use. The components of an IDEF1X view are:

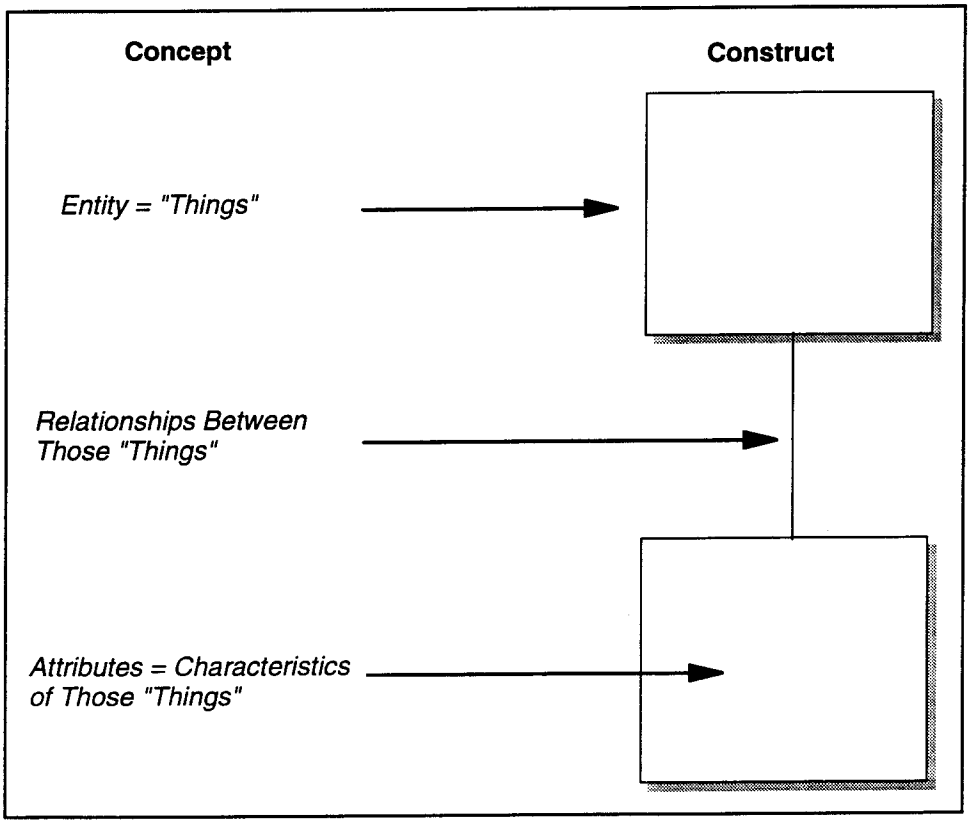


Figure 2 - IDEF1X Components

- **Entities**
  Things about which data is kept, e.g., people, places, ideas, events, etc.

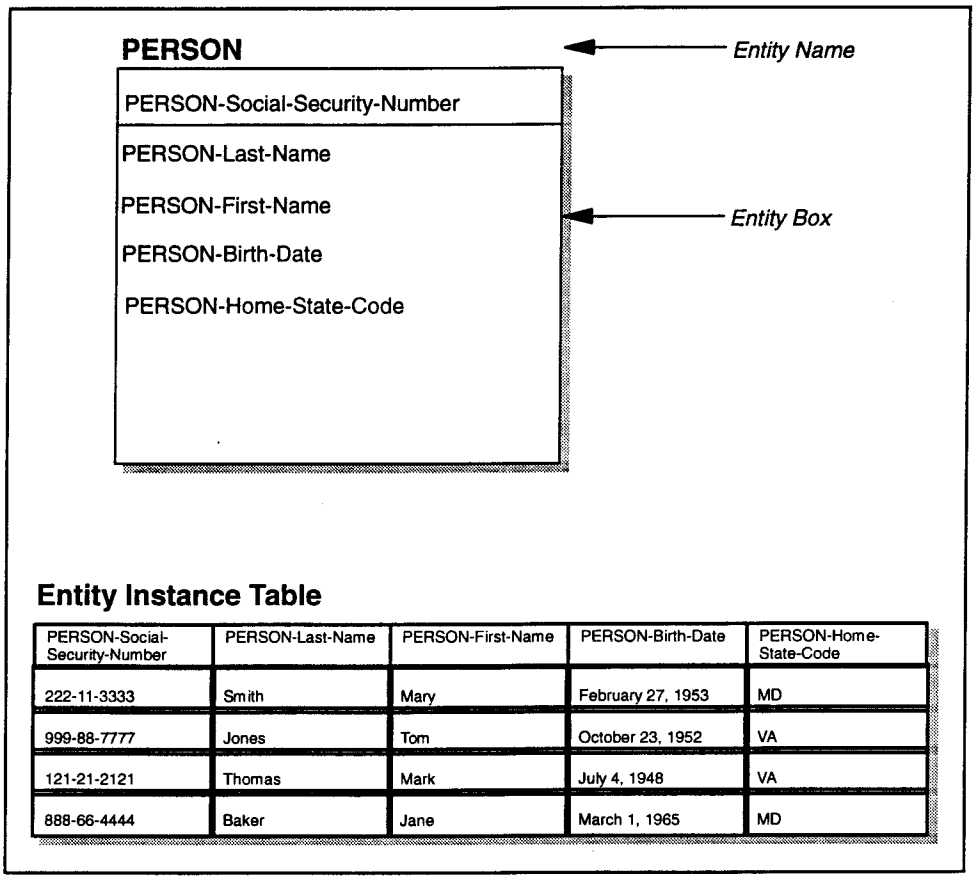
- **Attributes**
  Characteristics used to detail and describe those things (entities).

- **Relationships**
  Relationships between those things (entities) used to depict the business rules followed by the enterprise or business area being modeled.

Note: Standard IDEF1X components exist throughout the DoD and should be used when applicable.

B.3.1 Entity

An entity represents a set of real or abstract things (people, objects, places, events, ideas, combinations of things etc.) which have common attributes or characteristics. An entity name is a noun phrase that describes the set of things the entity represents. Although an entity may exist in a number of different IDEF1X models, it only appears once within a given diagram. An individual member of the set is referred to as an "entity instance." An "instance" of the entity PERSON would be "Mary Smith." Entities are represented on the model as a box with the entity name appearing on the top.



Entity Instance Table

PERSON-Social-Security-Number	PERSON-Last-Name	PERSON-First-Name	PERSON-Birth-Date	PERSON-Home-State-Code
222-11-3333	Smith	Mary	February 27, 1953	MD
999-88-7777	Jones	Tom	October 23, 1952	VA
121-21-2121	Thomas	Mark	July 4, 1948	VA
888-66-4444	Baker	Jane	March 1, 1965	MD

Figure 3 - Entity Syntax & Instance Table

As the model is refined, you may note that some of the boxes many have rounded corners—this notation is used to designate an entity as "Dependent." The concept of "Independent" and "Dependent" entities is detailed in the Advanced Concepts section.

B.3.2 Attribute

Attributes represent a type of characteristic or property associated with a set of real or abstract things (people, objects, events, ideas, combinations of things etc.). An attribute instance is a specific characteristic of an individual member of the set. An attribute instance is defined by both the type characteristic and its value, referred to as an "attribute value." An instance of an entity then, will usually have a single specific value for each associated attribute. For example, PERSON-Last-name and PERSON-Birth-Date may be attributes associated with the entity PERSON. An instance of the entity PERSON could have the attribute values of "Smith" and "February 27, 1953."

Each entity must have an attribute or combination of attributes whose values uniquely identify every instance of the entity. Those attributes form the "**Primary Key**" of the entity. For example, the attribute PERSON-Social-Security-Number might serve as the primary key for the entity PERSON, while the PERSON-Last-Name and PERSON-Birth-Date would be "**Non-Key**" attributes. The following illustrates the proper drawing syntax used for attributing an entity.

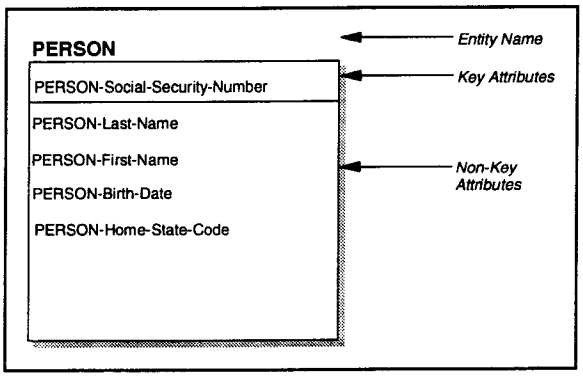


Figure 4 - Syntax for Attributing and Entity

DoD Naming conventions require that all non-key attributes are named using the entity name as the prime term (first part of the name). The attribute name must end with one of the approved DoD class words (refer to section B.8, Class Word Name Definitions). Naming of the attribute is clearer once you have written a definition and defined the "domain values." Domain values are the

meaning of the codes and numbers associated with a particular attribute. For Example, the attribute PERSON-Home-State-Code would have domain values like CA, MD, VA, SC, etc. DoD naming conventions require attribute names to be singular, without abbreviations or acronyms.

B.3.3 Relationship

Relationships between entities are designated by lines connecting one entity box to another. Designation of a relationship between two entities can be either termed

- **Non-Specific Relationships**
  Non-Specific Relationships are used in high level entity-relationship models (Section B.4). These relationships are simply termed many-to-many relationships. An example of this concept would be a relationship between the entities PERSON and CAR. Using these two entities you might see that a CAR could be owned by many PERSONs and a PERSON could own many cars. This results in a many-to-many relationship between the two entities.

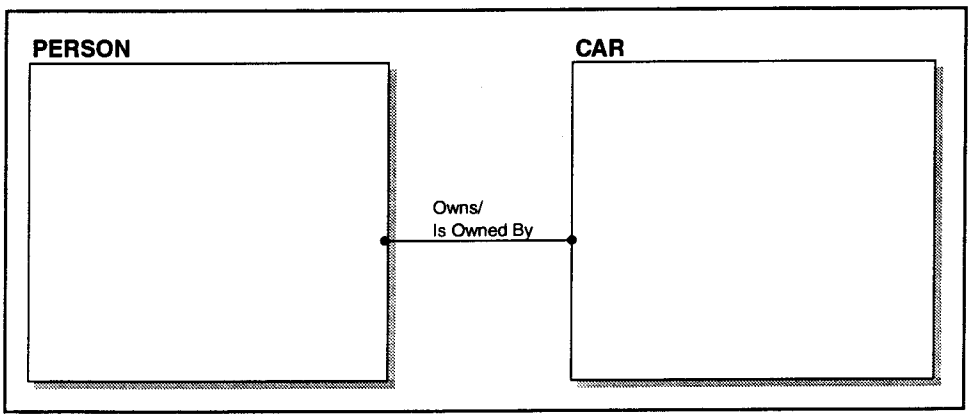


Figure 5 - Non-Specific Relationship

Non-Specific relationships should only exist at the Entity-Relationship (ER) level.

You will notice a "dot" on both ends of the relationship connection. These "dots" designate that zero, one, or many instances of the second entity are related to the first entity. A dot on both ends of the relationship connection depicts a many-to-many relationship. *"Relationship Cardinality"* is the formal term used when discussing "dots." Cardinality will be discussed further in Section B.6.2.

- **Specific Relationships**
  Specific relationships are known as parent-child relationships and are depicted as a line drawn between the parent entity and the child entity with a dot at the child end of the line.

  Identifying Relationship
  Identifying relationships are used to establish existence dependance or uniqueness between two entities. Should the key attributes of the parent entity be required to uniquely identify an instance of the child entity, the relationship is referred to as an "*Identifying Relationship.*" An example of an identifying relationship would exist between the entities PERSON and DRIVERS-LICENSE. A DRIVERS-LICENSE would have to have the PERSON-Social-Security-Number as part of the key set to uniquely identify a single instance (This is true in the state of Virginia where the Drivers License number is the Social Security Number of the individual). The entity DRIVERS-LICENSE is referred to as a "Dependant Entity" in this example.

You will notice that the DRIVERS-LICENSE-Expiration-Date is required to uniquely identify one instance of a DRIVERS-LICENSE.

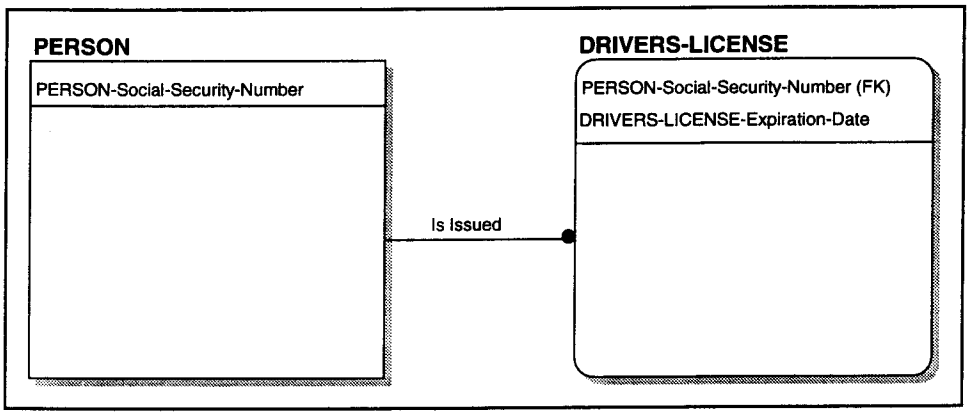


Figure 6 - Identifying Relationship

Non-Identifying Relationship

When the key attributes of the parent entity are not required to uniquely identify an instance of the child entity the relationship is referred to as a *"Non-Identifying Relationship."* In the following example, you will see two INDEPENDENT entities that are not existence dependent, but require a relationship to identify all persons (e.g., a roster) that attend a particular instance of a DRIVER-EDUCATION-COURSE. The syntax used to depict a non-identifying relationship is a "dotted" relationship line.

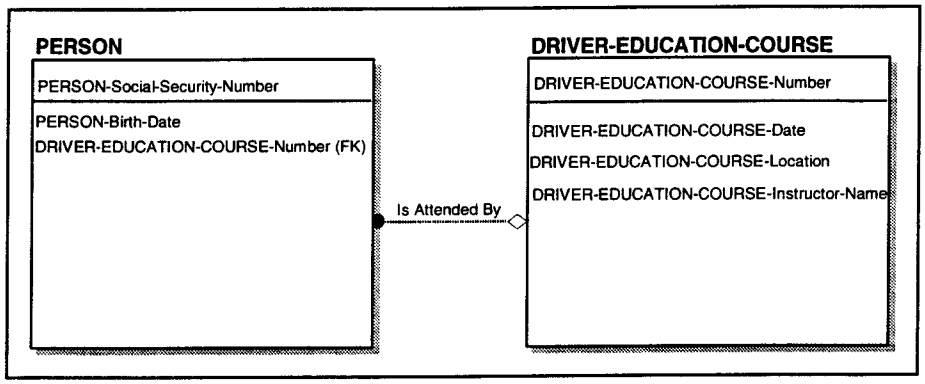


Figure 7 -Non-Identifying Relationship

- **Category Relationships**

  Entities are used to represent the notion of "things about which we need information." Since some real world things are categories of other real world things, some entities must in some sense, be categories of other entities. Using the example of DRIVERS-LICENSE you may recall that there are "types" of drivers licenses:

  - Regular (Personal car, Motorcycle, Scooter, etc),
  - Commercial (Tractor/Trailers, Trucks, School Buses etc.).

Although there is some information needed about all DRIVERS-LICENSEs, additional information may be required for individuals driving trucks (e.g., Medical Examination required every 2 years). Note that the category entities "inherit" all attributes of the parent entity.

The following graphic depicts the category syntax used to illustrate category relationships.

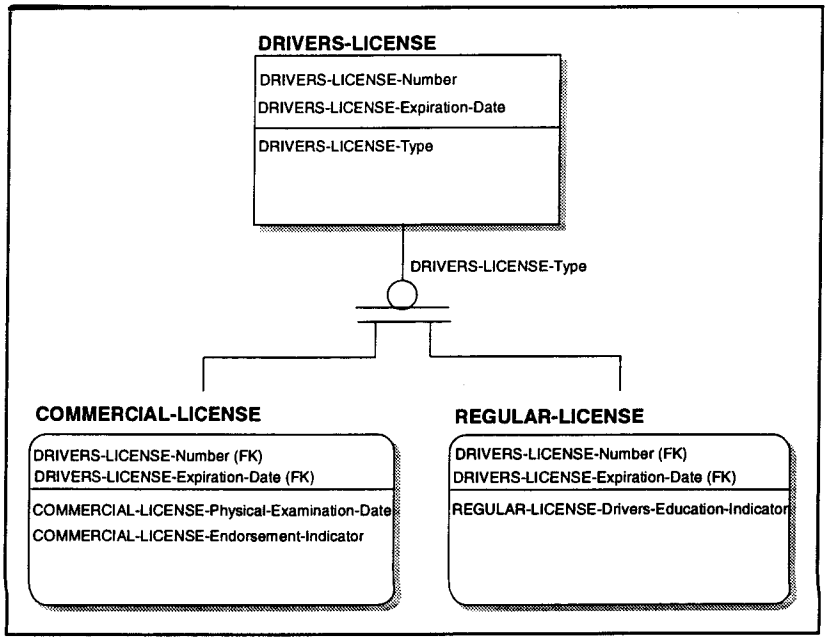


Figure 8 - Category Relationship

Category entities are always identifier-dependent. The following graphic depicts the syntax used to draw category entities. If the circle has a double underline, it indicates that the set of category entities is complete. A single line under the circle indicates an incomplete set of categories. The name of the attribute used as the category discriminator is written next to the circle.

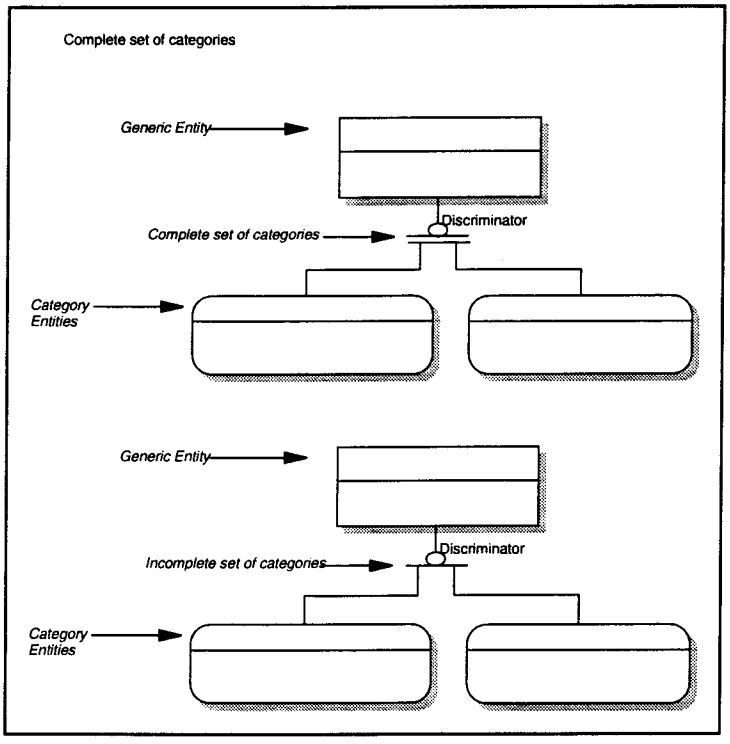


Figure 9 - Incomplete/Complete Categorization Syntax

B.4 View Levels of IDEF1X Models

There are three conceptual schema levels of IDEF1X modeling; ER, Key-Based (KB), and Fully-Attributed (FA). With each subsequent level, additional information is added to enhance and enrich the model. The numbers of entities, relationships, and attributes increase to the point where the model meets "normalization rules" (Reference Section V). Integration, standardization, and physical database design require IDEF1X models to be FA and normalized. The following table provides a summary of the levels of IDEF1X views.

View Levels and Content

Feature \ View Type	ER Level	KB Level	FA Level
Entities	Yes	Yes	Yes
Specific Relationships	Yes	Yes	Yes
Non-Specific Relationships	Yes	No	No
Category Relationships	Yes	Yes	Yes
Primary Keys	No	Yes	Yes
Alternate Keys	No	Yes	Yes
Foreign Keys	No	Yes	Yes
Non-Key Attributes	Yes (note 1)	Yes	Yes

Note 1: Attributes are not distinguished as key or non-key; they are allowed but not required in ER level views.

B.5 Normalization

Normalization is the process utilized to ensure that the relationships in the model accurately reflect the business rules of the enterprise and that facts are presented in one place and one place only. Formal database normalization theory allows for five (5) normal forms (or levels) with first normal form being most liberal and fifth normal form.

A common definition of third normal form (3NF) is as follows:

Definition
An entity is in third normal form if every non-key attribute of the entity.

- Represents a single, atomic fact about the entity
- Depends on the keys of that entity
- Depends on the whole key of the entity and
- Does not depend on any key or non-key attribute of any other entity

B.5.1 Normalization Rules

There are some basic normalization rules that assist modelers in creating stable data models which accurately reflect the business rules within the model's scope.

Rule 1 - The No-Repeat Rule
Compliance with this basic rule results in a data model that is in first normal form. The test is rather simple and examines each non-key attribute ensuring that one and only one occurrence of the attribute is required for each individual entity instance. The following illustration addresses the No-Repeat Rule refinement. Notice that the subject of the diagram shows the PURCHASE-ORDER-Number and the PURCHASE-ORDER-Item-Number as members of the primary key of PURCHASE-ORDER. Evaluation of the way PURCHASE-ORDER-Item-Number is used will show that a single PURCHASE-ORDER (entity instance) can have many PURCHASE-ORDER-Item-Numbers, one for each item being ordered. To properly depict this in the data model, a new entity called PURCHASE-ORDER-ITEM would have to be created, and the relationship label, syntax, and definition added. Then the true characteristics of the association between purchase orders and purchase order items begins to emerge.

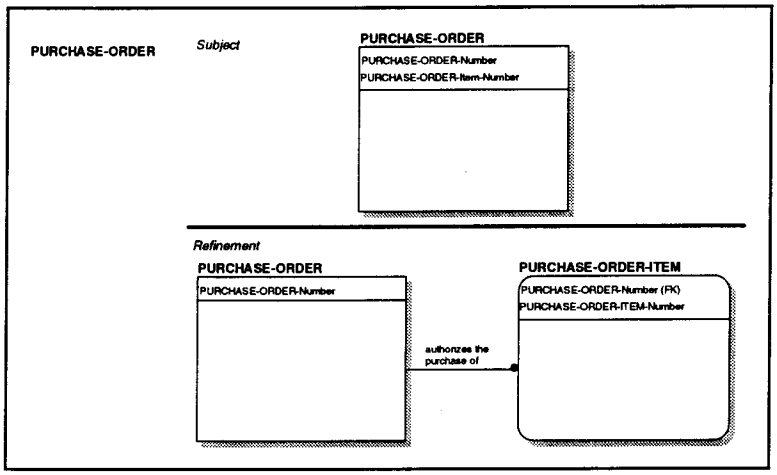


Figure 10 - Implementing the No-Repeat Rule

The No-Repeat rule should also examine foreign key migrations to ensure that no entity instance can have more than one value for each foreign key. If this situation should occur, it is likely that one or more of these relationships may be redundant and are candidates for removal from the model.

Rule 2 - The No-Null Rule

The No-Null rule quite simply means all instances of an attribute must have real values and cannot be null. A common example of this would be a PO-Box-Number as part of an address. In this example the resolution would be to designate the PO-Box-Number as an optional attribute. This optional syntax is designated as PO-Box-Number (O). The following illustration presents another type of resolution for an No-Null violation. Note that PART-Number has migrated to PURCHASE-ORDER-ITEM. This association was established because purchase order items are linked in some way with the parts. The diagram as shown asserts that every purchase order item is associated with exactly one part number. Further analysis reveals that not all purchase order items are associated with parts. Some may be associated with services or other commodities that have no part numbers. This prohibits the migration of PART-Number directly to the PURCHASE-ORDER-ITEM entity and required the establishment of a new entity called ORDERED-PART-ITEM in the example.

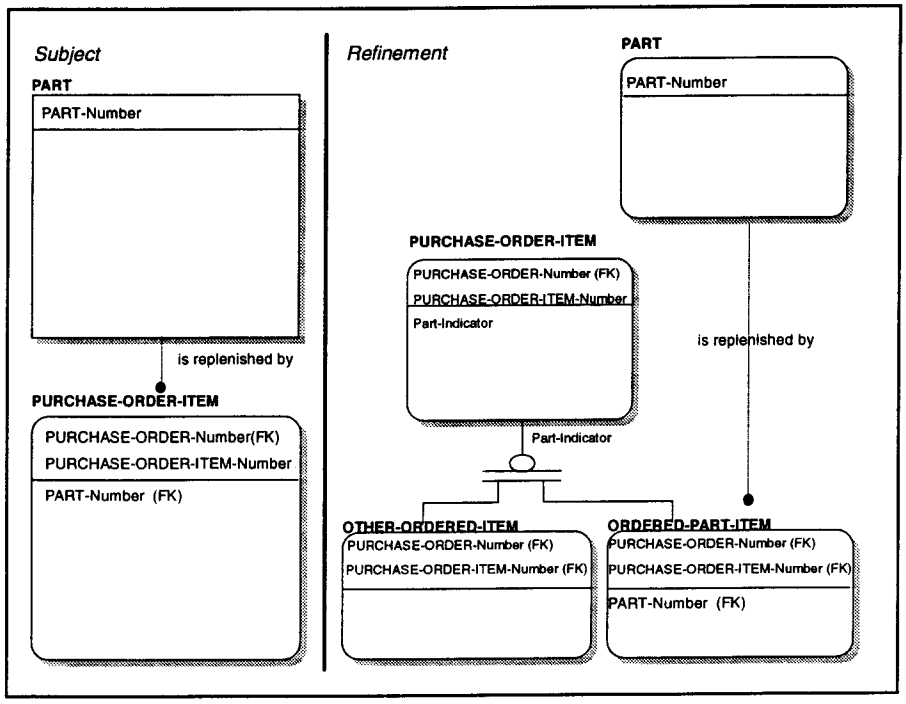


Figure 11 - No-Null Rule Refinement

Application of the No-Null test to migrated foreign keys may result in the creation of a new entity. The new entity is usually a category entity, but may be a child entity with a "Z" cardinality. (Reference Section B.6, Advanced Model Semantics, for additional information).

Rule 3 - The Smallest Key Rule
Each compound primary key should be examined to make sure it complies with the Smallest-Key Rule. This rule requires that an entity with a compound primary key can be split into two or more entities, with simpler primary keys (fewer components). If you can find a single component for the key (or invent one), you will often have a good key.

B.6 Advanced Model Semantics

B.6.1 Dependent/Independent Entities

There are two types of entities that are depicted in IDEF1X models: Independent and Dependent. Independent Entities are those "things" are can be uniquely identified by their own "native" key sets. Dependent entities are "existence dependent" and require "key" attributes to migrate from other entities to uniquely identify an instance of the entity. The following illustration depicts the syntax for constructing Independent and Dependent entities.

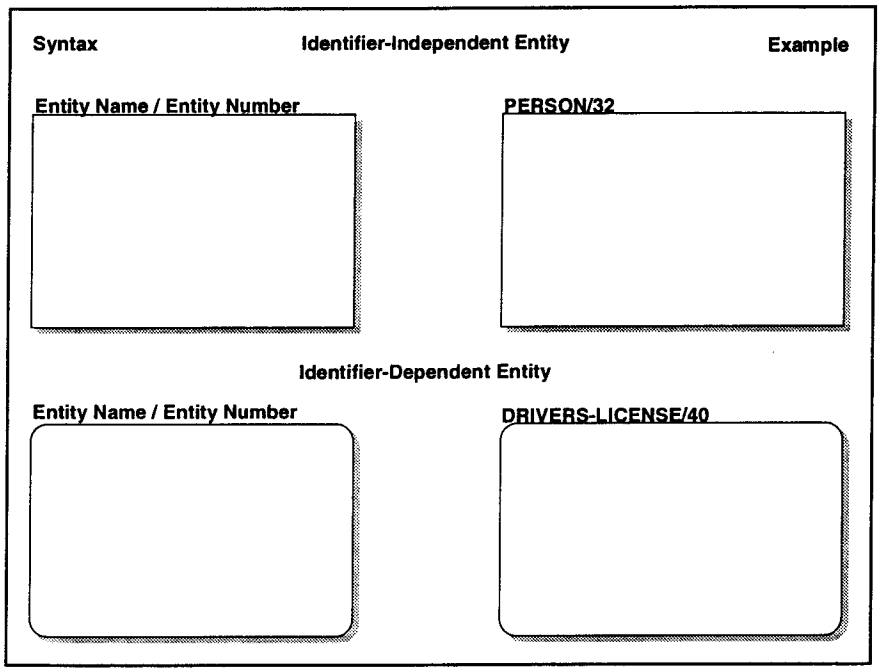


Figure 12 - Entity Syntax

B.6.2 Cardinality

A specific connection relationship is depicted as a line drawn between the parent entity and the child entity with a "dot" at the child end of the line. The default child cardinality is zero, one, or many. A "P" (for positive) is placed beside the dot to indicate a cardinality of one or more. A "Z" is placed beside the dot to indicate a cardinality of zero or one. If the cardinality is an exact number, a positive integer number is placed beside the dot. If the cardinality is a range, the range is placed beside the dot. The following illustration presents the various cardinality options.

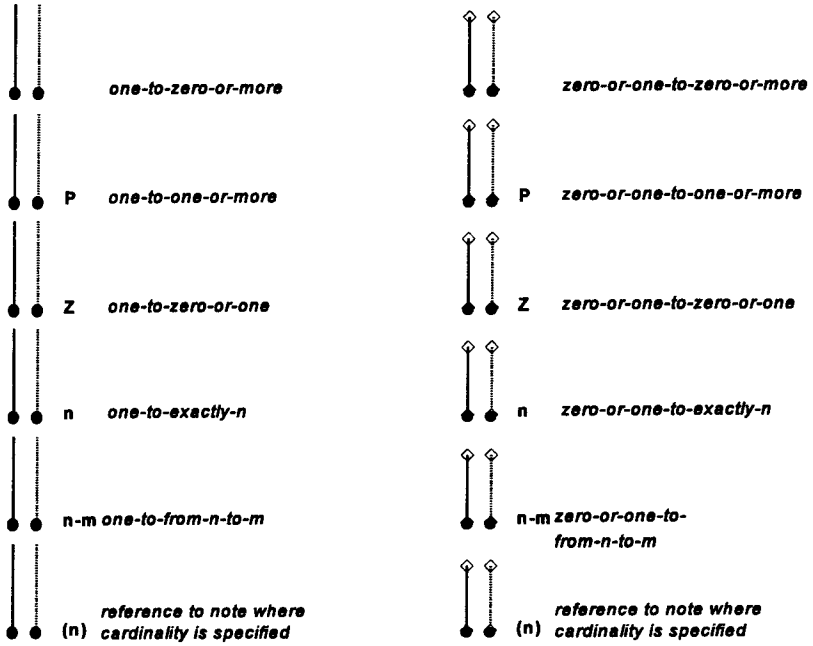


Figure 13 - Cardinality Syntax

B.6.3 Recursive Relationships and Role Names

A recursive relationship is established by constructing a non-identifying relationship from and to the same entity. The recursive relationship supports the IDEF1X principle that if two things have the same name/meaning, they are the same thing. IDEF1X utilizes a "role name" in front the key attribute names to create the new/migrated foreign keys. The following illustration depicts the proper syntax for creating recursive relationships and role names.

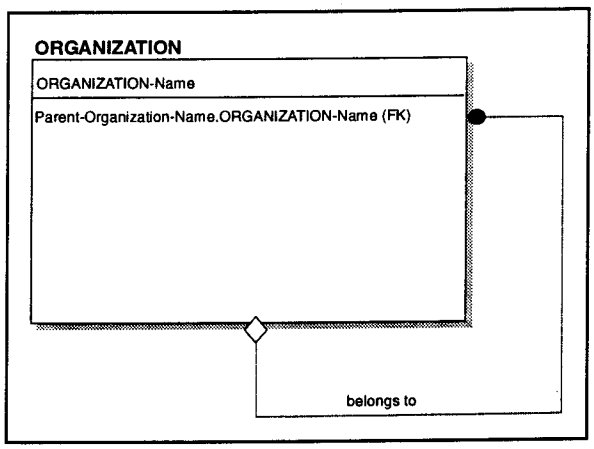


Figure 14 - Recursive Relationships & Role Names

Role names are also used when an attribute migrates into an entity through more than one relationship - thus requiring an additional title to distinguish one from another. If an instance of an entity can have one value for one occurrence, and another value for another, then each occurrence must be given a different role name.

B.6.4 Optional Relationships

The illustration used to describe recursion also serves as an example of an optional relationship. The small diamond on the end of the non-identifying recursive relationship is used to depict an "optional relationship." An optional non-identifying relationship represents a *conditional* existence dependency. In other words, each ORGANIZATION may consist of zero, one, or more other ORGANIZATIONs. If there are no component ORGANIZATIONs, the "diamond" syntax allows for a "null" value.

B.6.5 Alternate keys

Alternate keys are attributes that have not been chosen as "primary keys" but could also be used to uniquely identify an instance of the entity. Alternate keys are designated from their non-key places by adding an (AK) at the end of the attribute name. If you desired to identify a PERSON by using the combination of PERSON-Name (AK) and PERSON-Birth-Date (AK) the (AK) designation of the attributes would inform the reader of your selection.

B.7 Definitions

Alias
A nonstandard name for an entity or domain (attribute).

Assertion
A statement that specifies a condition that must be true.

Attribute
A property or characteristic that is common to some or all of the instances of an entity. An attribute represents the use of a domain in the context of an entity.

Attribute, Inherited
An attribute that is a characteristic of a category entity by virtue of being an attribute in its generic entity or a generic ancestor entity.

Attribute, Migrated
A foreign key attribute of a child entity.

Attribute, Non-key
An attribute that is not the primary or a part of a composite primary key of an entity. A non-key attribute may be a foreign key or alternate key attribute.

Attribute, Optional
A non-key attribute of an entity that may be null in any instance of the entity.

Attribute, Owned
An attribute of an entity that has not migrated into the entity.

Attribute Value
A value given to an attribute in an entity instance.

Category Cluster
A set of one or more mutually exclusive categorization relationships for the same generic entity.

Category Discriminator
An attribute in the generic entity (or a generic ancestor entity) of a category cluster. The values of the discriminator indicate which category entity in the category cluster contains a specific instance of the generic entity. All instances of the generic entity with the same discriminator value are instances of the same category entity. The inverse is also true.

Conceptual Schema
See Schema.

Constraint
A rule that specifies a valid condition of data.

Constraint, Cardinality
A limit of the number of entity instances that can be associated with each other in a relationship.

Constraint, Existence
A condition where an instance of one entity cannot exist unless an instance of another related entity also exists.

Database
A collection of interrelated data, often with controlled redundancy, organized according to a schema to serve one or more applications.

Data Model
A graphical and textual representation of analysis that identifies the data needed by an organization to achieve its mission, functions, goals, objectives, and strategies and to manage and rate the organization. A data model identifies the entities, domains (attributes), and relationships (or associations) with other data, and provides the conceptual view of the data and the relationships among data.

Data Type
A categorization of an abstract set of possible values, characteristics, and set of operations for an attribute. Integers, real numbers, character strings, and enumerations are examples of data types.

Domain
A named set of data values (fixed, or possibly infinite in number) all of the same data type, upon which the actual value for an attribute instance is drawn. Every attribute must be defined on exactly one underlying domain. Multiple attributes may be based on the same underlying domain.

Enterprise
An organization that exists to perform a specific mission and achieve associated goals and objectives.

Entity
The representation of a set of real or abstract things (people, objects, places, events, ideas, combination of things, etc.) that are recognized as the same type because they share the same characteristics and can participate in the same relationships.

Entity, Category
An entity whose instances represent a sub-type or sub-classification of another entity (generic entity). Also known as sub-type or sub-class.

Entity, Child
The entity in a specific connection relationship whose instances can be related to zero or one instance of the other entity (parent entity).

Entity, Generic
An entity whose instances are classified into one or more sub-types or sub-classifications (category entity). Also known as super-type or super-class.

Entity Instance
One of a set of real or abstract things represented by an entity. The instance of an entity can be specifically identified by the value of the attribute(s) participating in its primary key.

Entity, Parent
An entity in a specific connection relationship whose instances can be related to a number of instances of another entity (child entity).

Existence Dependency
A constraint between two related entities indicating that no instance of one (child entity) can exist without being related to an instance of the other (parent entity). The following relationship types represent existence dependencies: identifying relationships, categorization relationships and mandatory non-identifying relationships.

External Schema
See Schema.

Functional Dependency
A special kind of integrity constraint that applies within the confines of a single entity "R, where each "X" value of "R" has associated with it at most one "Y" value of "R" (at any one time). Attributes "X" and "Y" may be composite.

Glossary
A set of definitions of entities and domains (attributes).

IDEF1X Diagram
See View Diagram.

IDEF1X Model
A set of one or more IDEF1X views, often represented as view diagrams which depict the underlying semantics of the views, along with definitions of the entities and attributes used in the views. See Data Model.

Identifier Dependency
A constraint between two related entities that requires the primary key in one (child entity) to contain the entire primary key of the other (parent entity). The following relationship types represent identifier dependencies: Identifying relationships, categorization relationships.

Key, Candidate
An attribute, or combination of attributes, of an entity whose values uniquely identify each entity instance.

Key, Alternate
Any candidate key of an entity other than the primary key.

Key, Composite
A key comprised of two or more attributes.

Key, Compound
Same as Key, Composite.

Key, Foreign
An attribute, or combination of attributes of a child or category entity instance whose values match those in the primary key of a related parent or generic entity instance. A foreign key results from the migration of the parent or generic entities primary key through a specific connection or categorization relationship.

Key, Migrated
Same as Key, Foreign.

Key Migration
The modeling process of placing the primary key of a parent or generic entity in its child or category entity as a foreign key.

Key, Primary
The candidate key selected as the unique identifier of an entity.

Key, Split
A foreign key containing two or more attributes, where at least one of the attributes is a part of the entities primary key and at least one of the attributes is not a part of the primary key.

Normal Form
The condition of an entity relative to satisfaction of a set of normalization theory constraints on its attribution. A specific normal form is achieved by successive reduction of an entity from its existing condition to some more desirable form. The procedures is reversible.

a) First Normal Form (1NF) - An entity is in 1NF if and only if an underlying simple domains contain atomic values only.
b) Second Normal Form (2NF) - An entity is in 2NF if and only if it is in 1NF and every non-key attribute is fully dependent on the primary key.
c) Third Normal Form (3NF) - An entity is in 3NF if and only if it is in 2NF and every attribute that is not a part of the primary key is non-transitively dependent (mutually independent) on the primary key. Tow or more attributes are mutually independent if none of them is functionally dependent on any combination of the others.

Normalization
The process of refining and regrouping attributes in entities according to the normal forms.

Null
A condition where a value of an attribute is not applicable or not known for an entity instance.

Relationship
An association between two entities or between instances of the same entity.

Relationship Cardinality
The number of entity instances that can be associated with each other in a relationship. See Constraint, Cardinality.

Relationship, Categorization (Category)
A relationship in which instances of both entities represent the same real or abstract thing. One entity (generic entity) represents the complete set of things the other (category entity) represents a sub-type or sub-classification of those things. The category entity may have one or more characteristics, or a relationship with instances of another entity not shared by all generic entity instances. Each instance of the category entity is simultaneously an instance of the generic entity.

Relationship, Connection
Same as Relationship, Specific Connection.

Relationship, Identifying
A specific connection relationship in which every attribute in the primary key of the parent entity is contained in the primary key of the child entity.

Relationship, Mandatory Non-identifying
A non-identifying relationship in which an instance of the child entity must be related to an instance of the parent entity.

Relationship Name
A verb or verb phrase which reflects the meaning of the relationship expressed between the two entities shown on the diagram on which the name appears.

Relationship, Non-identifying
A specific connection relationship in which some or all of the attributes contained in the primary key of the parent entity do not participate in the primary key of the child entity.

Relationship, Non-specific
A relationship in which an instance of either entity can be related to a number of instances of the other.

Relationship, Optional Non-identifying
A non-identifying relationship in which an instance of the child entity can exist without being related to an instance of the parent entity.

Relationship, Parent-Child
Same as Relationship, Specific Connection.

Relationship, Specific Connection
A relationship where a number of instances of one entity (child entity) can be related to zero or one instance of the other entity (parent entity). In a specific connection relationship the primary key of the parent entity is contributed as a foreign key to the child entity.

Role Name
A name assigned to a foreign key attribute to represent the use of the foreign key in the entity.

Schema
A definition of data structure:

a) Conceptual Schema: A schema of the ANSI/SPARC Three Schema Architecture, in which the structure of data is represented in a form independent of any physical storage or external presentation format.
b) External Schema: A schema of the ANSI/SPARC Three Schema Architecture, in which views of information are represented in a form convenient for the users of information; a description of the structure of data as seen by the user of a system.
c) Internal Schema: A schema of the ANSI/SPARC Three Schema architecture, in which views of information are represented in a form specific to the data base management system used to store the information; a description of the physical structure of data.

Semantics
The meaning of the syntactic components of a language.

Synonym
A word, expression, or symbol accepted as a figurative or symbolic substitute for another word or expression; that is, an alternative name for the same thing. (See Alias).

Syntax
Structural components or features of a language and rules that define relationships among them.

Verb Phrase
A phrase used to name a relationship, which consists of a verb and words which comprise the object of the phrase.

View
A collection of entities and assigned attributes (domains) assembled for some purpose.

View Diagram
A graphic representation of the underlying semantics of a view.

B.8 Class Word Name Definitions

(from 8320.1-M-1, Appendix A)

Class Word Name	Abbreviation	Description and/or Definition Structure
Amount	AM	A monetary value. (Includes average balance, deviation, factor, index, level, mean, mode, scale, and yield.) The generic element definition should begin: "The monetary unit representing..." The data element definition should begin: "The (modifiers) amount of..."
Angle	AN	The rotational measurement between two lines and/or planes diverging from a common point and/or line. (Includes azimuth and heading.)
Area	AR	The measurement of a surface expressed in unit squares (2-dimensional). The generic element definition should begin: "The area of..." The standard data element definition should begin: "The (modifiers) area of..."
Code	CD	A combination of one or more numbers, letters, or special characters substituted for a specific meaning. Represents finite, predetermined values. (Must have a specific domain.) Includes category and status. The generic element definition should begin: "The specific value that represents and/or denotes a..." The standard data element definition should begin: "The (modifiers) code that represents and/or denotes a..."

Class Word Name	Abbreviation	Description and/or Definition Structure
Coordinate	CN	Designation of the location of a line or plane. (Includes latitude and longitude.) The generic element definition should begin: "The numeric designation identifying the location of..." The standard data element definition should begin: "The coordinate identifying the (modifiers) location of..."
Date	DT	The designation of a specific 24-hour period of time. The generic element definition should begin: "The date of and/or when and/or on which a..."
Dimension	DM	A measured linear distance (1-dimensional). (Includes altitude, depth, diameter, elevation, height, length, radius, vertex, and width.) The generic element definition should begin: "The one-dimensional linear measurement (length, width, height, radius, or elevation, etc.) of and/or from..." The standard data element definition should begin: "The dimension (length, width, height, radius, or elevation, etc.) of and/or from..."
Identifier	ID	A combination of one or more numbers, letters, or special characters that designate a specific object/entity but that have no readily definable meaning. (Must have a general domain.) (Includes designator, key, number.) The generic element definition should begin: "The unique value, or set of characters, assigned to represent..."

Class Word Name	Abbreviation	Description and/or Definition Structure
		The standard data element definition should begin: "The (modifiers) identifier that represents..."
Mass	MS	The measure of inertia of a body. The generic element definition should begin: "The measure of inertia of..." The standard data element definition should begin: "The (modifiers) mass of..."
Name	NM	A designation of an object and/or entity expressed in a word or phrase. The generic element definition should begin: "The word(s) that represent(s)..." The standard data element definition should begin: "The name of..."
Quantity	QY	A nonmonetary numeric value. (Includes average, balance, count, deviation, factor, index, level, mean, median, mode, and scale.) The generic element definition should begin: "The nonmonetary numeric unit representing the count or calculated unit or aggregated unit of..." The standard data element definition should begin: "The (modifiers) quantity of..."
Rate	RT	A quantity or degree of something in relation to units of something else (e.g., miles per gallon). (Includes acceleration, density, factor, flow, force, frequency humidity, impedance, inductance, intensity, magnitude, moment, percent, power, pressure, resistance, scale, speed, tension, torque, velocity, viscosity, and voltage.)

Class Word Name	Abbreviation	Description and/or Definition Structure
		The generic element definition should begin: "The relationship that represents (force, speed, or pay, etc.) of..."
		The standard data element definition should begin: "The rate of..."
Temperature	TP	The measure of heat in an object or space.
		The generic element definition should begin: "A number representing the heat of..."
		The standard data element definition should begin: "The temperature of...
Text	TX	An unformatted character string, generally in the form of words. (Includes category and comments.)
		The generic element definition should begin: "The freeform narrative that (describes and/or defines)..."
		The standard data element definition should begin: "The text of..."
Time	TM	A designation of a specified chronological point within a period.
		The generic element definition should begin: "The specific chronological point that designates the occurrence (in the past, present, or future) of..."
		The standard data element definition should begin: "The time of..."
Volume	VL	Measurement of space occupied by a three-dimensional figure as measured in cubic units.

Class Word Name	Abbreviation	Description and/or Definition Structure
		The generic element definition should begin: "The three-dimensional cubic measurement of..."
		The standard data element definition should begin: "The volume of..."
Weight	WT	The force with which an object is attracted toward the earth and/or another celestial body by gravitation.
		The generic elements definition should begin: "The weight of..."
		The standard data element definition should begin: "The weight of..."

Appendix C - Acronyms

3NF	third normal form
BPR	Business Process Reengineering
DoD	Department of Defense
DOJ	Department of Justice
ER	Entity-Relationship
ERMS	Electronic Records Management Software
FA	Fully-Attributed
FIPS	Federal Information Processing Standard
FK	Function Key
FPI	Functional Process Improvement
GAO	General Accounting Office
GSA	General Services Administration
ICOM	An abbreviation for Input, Control, Output, and Mechanism
IDEF0	Integration Definition for Function Modeling
KB	Key-Based
NARA	National Archives and Records Administration
ODASD(IM)	Office of the Deputy Assistant Secretary of Defense for Information Management
OMB	Office of Management and Budget
RM	Records Management
TF	Task Force

Appendix D - Previous Reports

Title	Date of Report
DoD RM FPI Scoping Session	October 1, 1993
DoD RM FPI Air Force AS-IS Report	November 10, 1993
DoD RM FPI Army AS-IS Report	November 10, 1993
DoD RM FPI Navy AS-IS Report	November 10, 1993
DoD RM FPI OSD AS-IS Report	November 10, 1993
DoD RM FPI Matrix & Activity Based Costing Workshop Report	December 3, 1993
DoD RM FPI TO-BE Report	January 14, 1994
DoD RM FPI Technical Team Meeting 5	February 23-25, 1994
DoD RM FPI Technical Team Meeting 6	April 18-20, 1994
DoD RM FPI TO-BE Information Model Report (IDEF1X) with Change 1	April 27, 1994
DoD RM BPR Implementation Planning: Review of Improvement Opportunities Report	May 12-18, 1994
Executive Level Report (Condensed)	May 26, 1994
DoD RM BPR Activity Based Costing	June 8-9, 1994
DoD RM BPR Technical Team Session 7	June 20-22, 1994
DoD RM Implementation Data Standardization Report	July 19-20, 1994
DoD RM BPR Compendium Report	August 1994
DoD "Managing Information as Records" Proposed Implementation Planning for the DoD Records Management Task Force	September 21-22, 1994
Managing Information as Records 2003 DoD RM Task Force Report 1	January 1995
DoD RM Refinement of the Generic Entity RECORD	March 1995
Automated Document Conversion Master Plan V 1.0—OASD(C3I Report)	April 1995

Title	Date of Report
DoD RM FPI Scoping Session	October 1, 1993
DoD RM TF Electronic RM Software	May 10, 1995
DoD RM TF Electronic RM Test Requirements - Academia & Industry Review	May 16, 1995
DoD RM TF Electronic RM Functional Requirements - Government Team Review	May 19, 1995
DoD Data Standardization RM Implementation Update 1	June 10, 1995
DoD RM TF & University of British Columbia School of Library, Archival and Information Studies - Applying IDEF Methodology to Describe Archival Science and Diplomatics	June 26, 1995
DoD RM TF A Composite Analysis of Function Models: Manage Records, Manage Administrative Information, Provide Visual Information, Convert Documents, and Manage Archival Fonds	July 21, 1995
DoD RM TF & University of British Columbia School of Library, Archival and Information Studies - Applying IDEF Methodology to Describe Archival Science and Diplomatics - Report 2	Projected October 10, 1995