# Introducing the D. R. I. E. Data Management Centre (DMC) and its Procedures

November 1987

Info. Mgmt. Branch

# INTRODUCING

# THE

# DATA MANAGEMENT CENTRE
# (DMC)

# AND ITS PROCEDURES



November 1987

Information Management Branch

Data Management Centre

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# 1.0 INTRODUCTION

## Purpose

The purpose of this manual is to introduce the reader to the role and functions of the Data Management Centre (DMC) within DRIE and to explain the procedures for interfacing with DMC personnel.

## Scope

This manual is specifically intended for the use of all personnel involved in developing new applications at DRIE. Procedures on modifications to the Corporate Database (CDB) are described in the "Change Control Procedures Guide". It is not the intention of this manual to duplicate procedures which are described in other DRIE manuals. This manual contains references to those other manuals and detail where procedures are not redundant.

## Objective

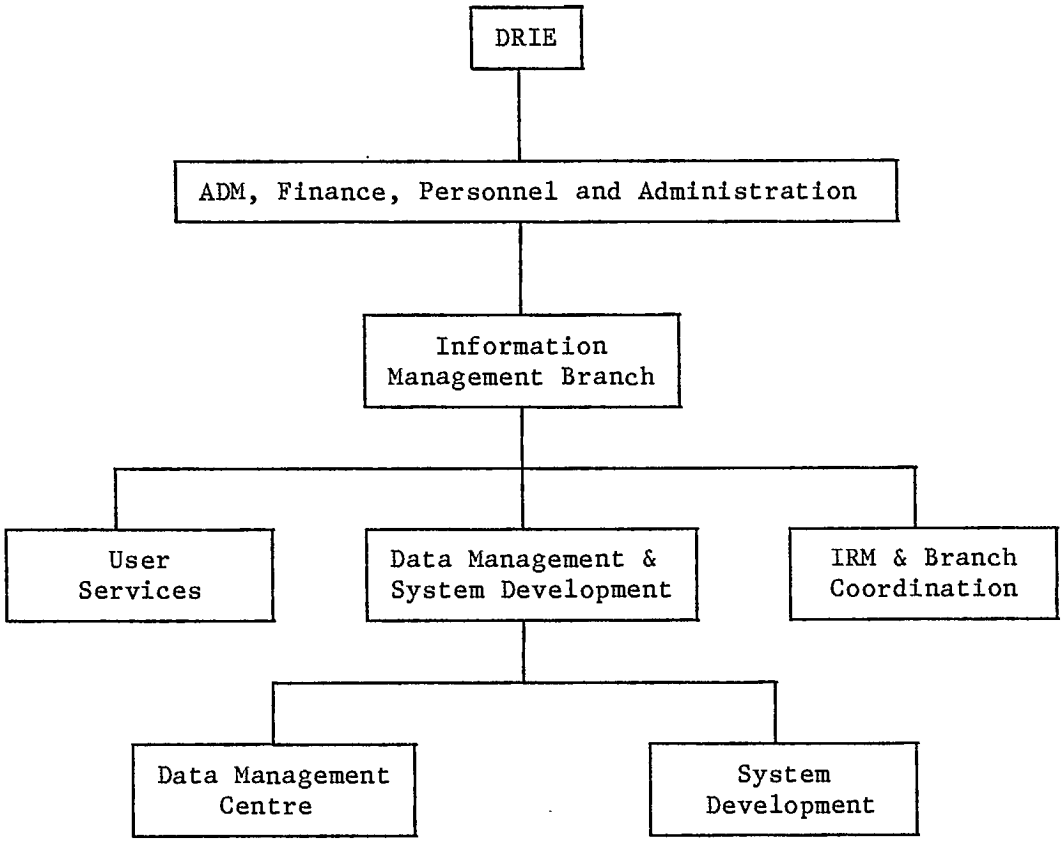
The primary objective of this manual is to provide guidance to development teams involved in developing new applications at DRIE. It is hoped that this will minimize any confusion as to who is responsible for carrying out certain actions, throughout the various phases of the System Development Life Cycle (S.D.L.C.).

It is further hoped that this manual will clarify the appropriate time frames for such activities to be executed and improve communications between DMC personnel and their clients.

**NOTE TO READERS: While the term "Departmental" data is commonly defined within the data processing community to mean "distributed" or "local" data, this manual uses the term "Departmental" data or systems to mean "corporate" or "belonging to the Department" (DRIE)".**

## 2.0 THE ORGANIZATION

### 2.1 DRIE




Data Management
Database Administration
Data Modelling
Data Planning
Data Standards
Data Quality Assurance
Database Technical Support
Data Dictionary Administration

System Development
System Maintenance
System Methodologies
System Standards
System Quality Assurance

## 2.0 THE ORGANIZATION (cont'd)

### 2.2 POLICY AND GUIDELINES FOR THE MANAGEMENT OF DATA

Policy

The following are excerpts from the DRIE Information Resource Management Policy.

1.4 Information is a resource which is owned by the Department and will be managed as such.

1.4.2 In order to ensure that Departmental data is compatible and shareable among users and information systems, the following data management policy will be applied:

- data must be collected and stored in a manner that reduces duplication and ensures data integrity and security;
- data captured and stored in national information systems and systems that are interconnected with national systems must conform with Departmental data standards;
- documentation about all Departmental data, related processes and definitions must be resident in a common location; and
- the process and methodology used in the development of information systems must be consistent with the Departmental emphasis on data sharing.

2.10 The Data Management Centre

The Data Management Centre is the focal point for the Department's data resources. It provides support services related to the modelling and recording of Departmental data resources, files and processes and designs and supports Departmental databases. In addition to providing support to the development of Departmental systems, the Data Management Centre also provides, via the Information Centre, services and advice to end users regarding location, structures, contents and access options of data files.

2.0 THE ORGANIZATION (cont'd)

2.2 POLICY AND GUIDELINES FOR THE MANAGEMENT OF DATA (cont'd)

Guidelines

Both the integrity of data and its accessibility are fundamental to the accomplishment of the data management mission in DRIE. The success of that mission depends upon, and in large part can be measured against, the application of the following guidelines:

(1) A Departmental perspective on data is necessary if substantial progress is to be made on the elimination of duplication, errors and waste of resources.

(2) All development and maintenance of systems must place due emphasis on data, data pools and integrated processes so that creation of new data elements or changes to data are formally defined and accepted by the custodian of such data.

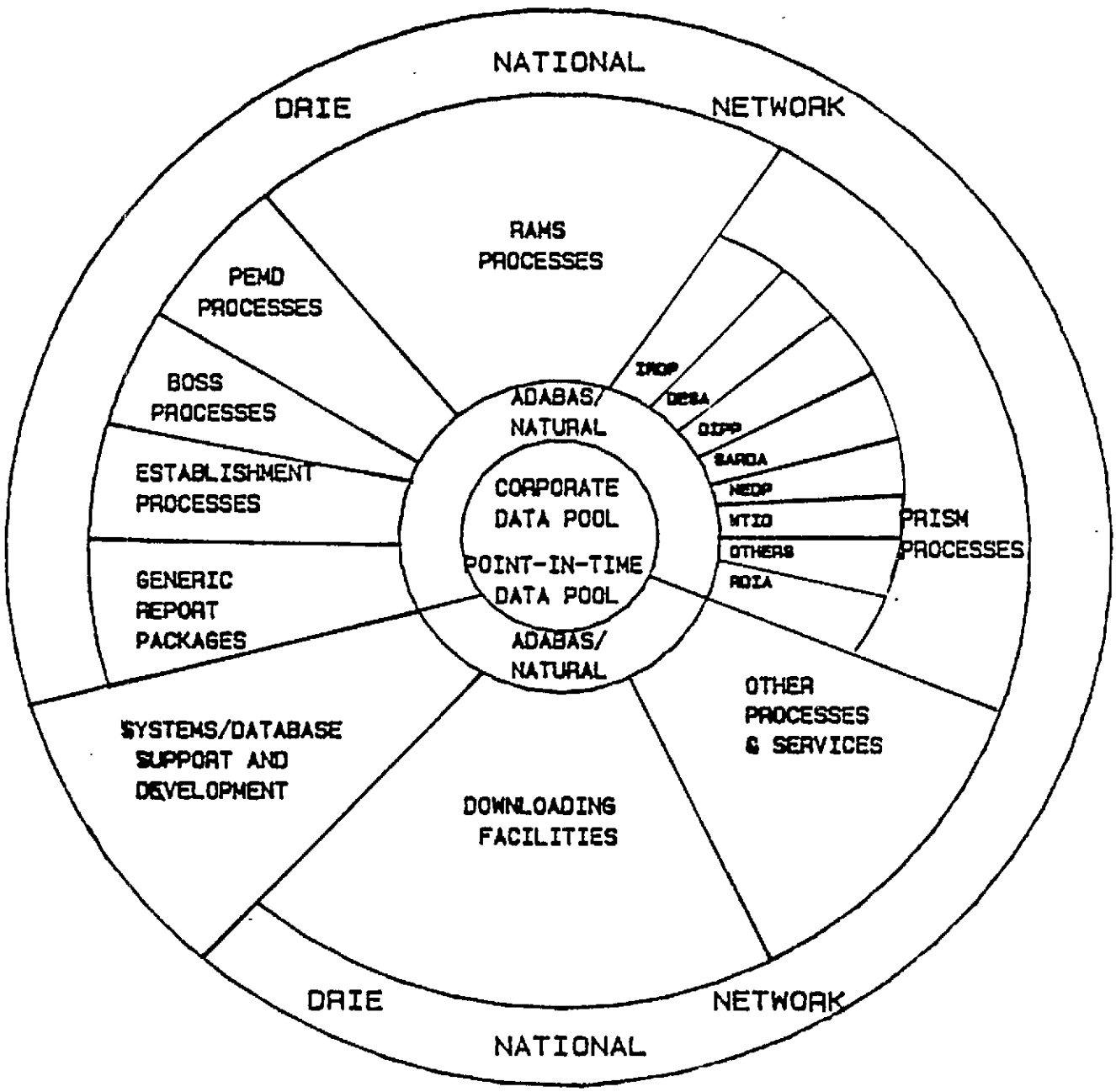
(3) There must be conformity in the definition and attributes for each data element so that its meaning and representation are unambiguous and unique. In particular, the structure of all data contained in Departmental databases must comply with specified standards.

(4) All documentation about data, data structures, data processes and their inter-relationships must be duly recorded in a location which is accessible to all interested parties. Data must be collected and stored in a manner that meets specified criteria for consistency, accuracy, reliability, etc.

(5) Facilities must be provided to ensure the security, integrity and survivability of the Department's data. Dispersal, replication, archiving and disposal of data must be in accordance with Departmental practices, Access to Information and Privacy (ATIP) legislation and central agency requirements.

2.0 THE ORGANIZATION (cont'd)

2.3 DRIE INTEGRATED NATIONAL SYSTEMS ENVIRONMENT



## 2.0 THE ORGANIZATION (cont'd)

### 2.4 DRIE CORPORATE DATABASE ENVIRONMENT

The DRIE Corporate Database (CDB) is a data oriented, integrated, Departmental database using state of the art computing and data management technology. The database serves independent and shared-process systems supporting many functional areas across the Department while complying fully with established data/information resource management principles.

The DRIE corporate database environment consists of two major areas, namely, development and production. Both use the same software and hardware, data structures and related standards and procedures. One physical database exists for each of these major areas. The corporate databases are supported to a very large extent by automated data management facilities and procedures.

The Information Resource Dictionary (IRD) is the base of automated data management support for the corporate database environment at DRIE. All data elements, data structures, databases, userviews, processes and screens are recorded in the IRD. Database structures and modifications are generated or extracted from information contained in the IRD.

The IRD has generalized interfaces to the database software. Custom interfaces have been created between DATAMANAGER and ADABAS to deal with specific standards, procedures and software at DRIE. The bulk of this customization is oriented to Dialog Manager modules, clists, and programs using NATURAL. These interfaces undergo constant review and enhancement to facilitate human communications between the development, operations, users and support areas.

The production database is one physical ADABAS database consisting of more than 130 ADABAS files representing approximately 300 logical views. The database currently occupies 1100 megabytes of 3350 disk space. Approximately 250 cylinders of disk space are used for protection and command logs. The development database occupies 350 megabytes of disk. These figures increase by a factor of 30% per year.

The production database processes approximately 21,000,000 ADABAS commands weekly; development, approximately 2,000,000.

The corporate databases run in multi-processing mode (MPM) primarily and in single user mode (SUM) on occasion. The operation of the databases is scheduled by the operations area under the DRIE Facilities Management arrangement.

## 2.0 THE ORGANIZATION (cont'd)

### 2.4 DRIE CORPORATE DATABASE ENVIRONMENT (cont'd)

The daily production and development MPM is controlled by an automated recovery system (MARS) created and supported by the Data Management Centre (DMC). Most database system failures are routinely recovered by the resubmission of the MPM job.

Database performance is monitored by the Data Management Centre. The TRIM software package is the primary tool assisting in the capturing of database statistics. This software is used to monitor both online and batch utilization. Current techniques for the chargeback of MPM usage incorporate output from TRIM. When performance problems or trends are identified, the application support team involved is informed of the problem and the implications. Recommendations for rectifying the problem are provided by the DMC as appropriate. It is advisable that TRIM be used early during the system development stage. This will ensure that a well performing system is achieved before entry into production.

The Information Resource Dictionary supports change control management. The development and production environments, including databases and applications processes and views, are reflected in the IRD. As changes to data and/or processes are made, the dictionary is updated to show all changes. All data element usage in processes and structures is updated interactively during the transfer of materials from the development to the production environment.

Data management facilities, based on the IRD, allow the development and support teams to do impact analysis in advance of proposed changes.

## 3.0 DATA MANAGEMENT CENTRE (DMC)

### 3.1 FUNCTIONAL ORGANIZATION

A brief overview of the sphere of involvement that this group entertains is required to place the role of this group in proper perspective. Functional organization charts are presented on the following pages.

The DMC also employs consultants/contractors to complement the present staff in fulfilling the Departmental data management role.

The DMC has involvement with several areas of the Department and must employ many skills in fulfilling their role. These areas are:

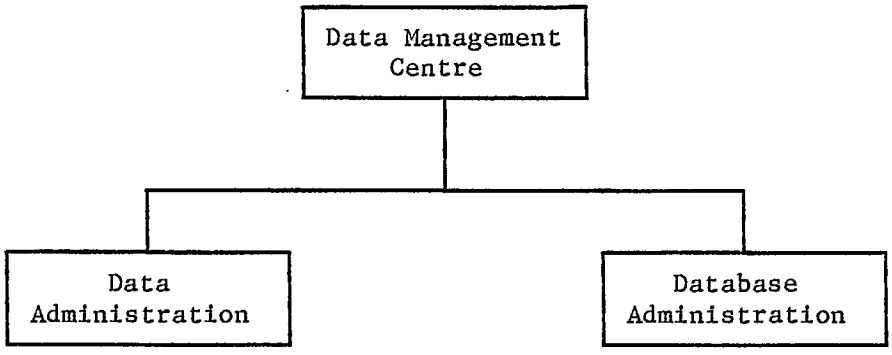
- production support;
- development;
- data modelling;
- data dictionary administration;
- database administration;
- user support;
- R&D.

There are external interfaces to:

- operations groups: CSG meetings/coordination meetings;
- production control - job scheduling and monitoring;
- systems programming via technical services (security/passwords);
- development groups - informal or on request: awareness, problem resolution, walk-throughs;
- user community - subject matter, techniques, products, facilities;
- vendor contacts;
- product "user" groups.

## 3.0 DATA MANAGEMENT CENTRE (DMC) (cont'd)

### 3.1 FUNCTIONAL ORGANIZATION (cont'd)

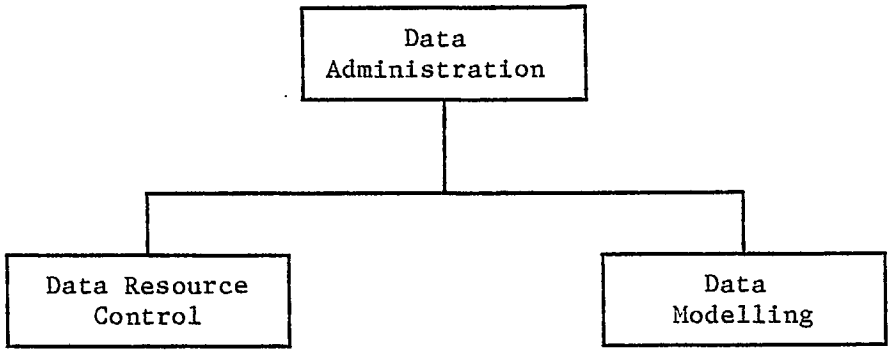



- Logical Data Modelling
- Data Analysis
- Data Resource Control
- Policies, Standards, Procedures
- Liaison with Systems Development
- Data Privacy

- Physical Database Design
- Data Security
- Backup/Recovery
- Application Programming Support
- Database Performance Monitoring

3.0 DATA MANAGEMENT CENTRE (DMC) (cont'd)

3.1 FUNCTIONAL ORGANIZATION (cont'd)

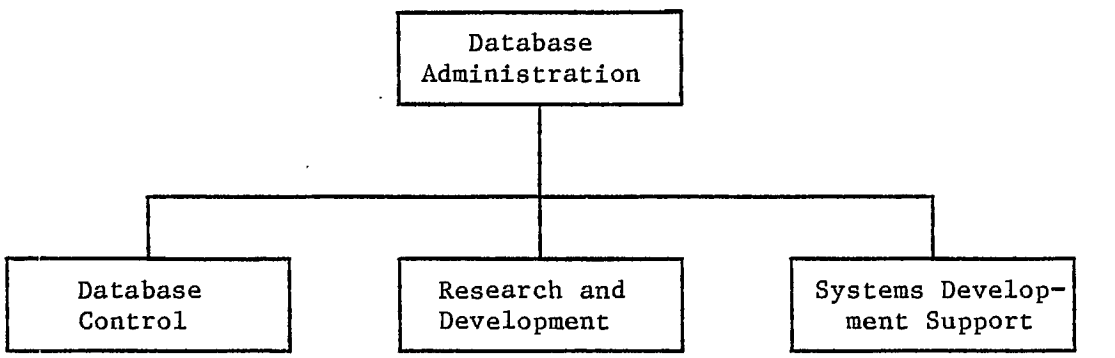



- Overall Guidelines
  Policies, Procedures, Standards, Plans, Strategies
- Document Models
  Business, Conceptual, Internal, External Models
- Tools and Techniques
  Information Resource Dictionary, Data Languages, Query Languages, Utilities
- Control
  Automated and Manual Data Integrity and Quality Controls

- Data Resource Development
  Data Requirements, Data Sources, Data Gathering, Data Ownership
- Data Modelling
  Conceptual Model, Function/Entity Matrix, Normalization
- Data Model Validation
  User Interviews, Compatibility Check with Corporate Business Model, Userview Synthesis
- Service Analysis
  Performance Requirements, Transaction Volumes, Update/Access Rates

## 3.0 DATA MANAGEMENT CENTRE (DMC) (cont'd)

### 3.1 FUNCTIONAL ORGANIZATION (cont'd)




- Backup/Recovery
- Performance Measurement
- "Fine-Tuning" Optimization
- New Release and Feature Testing
- Data Usage Control

- New DBMS/Dictionary Technology
- Tools and Techniques
- DBA Standards and Procedures
- Seminars, Conferences

- Database Design
- Application Programming Support
- On-Line Design Support
- Data Access

## 3.0 DATA MANAGEMENT CENTRE (DMC) (cont'd)

### 3.2 SYSTEM DEVELOPMENT LIFE CYCLE (SDLC)

The following is meant to overview the interaction of the development teams with the Information Resource Dictionary during the SDLC process, and, because DMC has responsibility for the IRD, to indicate when development team and DMC interfacing occurs.

For more information on the SDLC, refer to the manual - DEVELOPING INFORMATION SYSTEMS AT DRIE.

| WHEN | NATURE OF THE INTERACTION | WHO |
|---|---|---|
| Initiation | - Identification of Similar System<br>- Overview of General Text as appropriate<br>- Extraction of materials relevant to phase end deliverables | User,<br>Project Leader,<br>System Planner |
| Feasibility Study | - Description of Business Processes and Functions<br>- Definition of data elements<br>- Definition of entities, userviews, relationships<br>- Documentation of Prototype<br>- Completion of General Text as appropriate<br>- Modification/refinement of current IRD contents<br>- Extraction of materials relevant to phase end deliverables | Project Leader,<br>System Analyst,<br>Data Analyst,<br>User |
| Analysis | - Definition of data elements<br>- Definition of data stores, screens, forms, reports<br>- Definition of processes, and relationships to data stores<br>- Completion of General Text as appropriate<br>- Modification/refinement of current IRD contents<br>- Extraction of materials relevant to phase end deliverables | Project Leader,<br>System Analyst,<br>Data Analyst,<br>User |

3.0 DATA MANAGEMENT CENTRE (DMC) (cont'd)

3.2 SYSTEM DEVELOPMENT LIFE CYCLE (SDLC) (cont'd)

| WHEN | NATURE OF THE INTERACTION | WHO |
|---|---|---|
| Design | - Definition of subsystems<br>- Definition of programs, and relationships to subsystems, systems, and processes<br>- Definition of data elements<br>- Definition of records, files, databases<br>- Completion of General Text as appropriate<br>- Modification/refinement of current IRD contents<br>- Extraction of materials relevant to phase end deliverables | Project Leader, System Analyst, Data Analyst, System Designer, Database Analyst, User |
| Development | - Extraction of materials relevant to work content of this phase (e.g. directories, ADABAS-userview charts, impact reports)<br>- Definition of data elements<br>- Definition of computer jobs, clists, procedures and relationships to systems, subsystems, and physical files and their relationships to Records Management classes<br>- Completion of General Text as appropriate<br>- Modification/refinement of current IRD contents<br>- Extraction of materials relevant to phase end deliverables | Project Leader, System Analyst, Data Analyst Database Analyst, Programmer, User |
| Implement-ation | - Automated update of IRD contents via SCAN programs<br>- Extraction of materials relevant to phase end deliverables | Project Leader, System Analyst, Data Analyst, Database Analyst, Programmer, User |
| Post Imple-mentation Evaluation | - Extraction of materials relevant to physical systems under review<br>- Extraction of materials relevant to business functions, data model, and logical system under review | Project Leader, Auditor |

## 3.0 DATA MANAGEMENT CENTRE (DMC) (cont'd)

### 3.3 DOCUMENTATION AVAILABLE IN DMC

The following documentation is available from DMC. For other documentation available within the branch please refer to the "IMB documentation" list in the IRM and Branch Coordination Section.

| TITLE | DESCRIPTION |
|---|---|
| **SDLC** | |
| Developing Information Systems at DRIE | An overview of systems development life cycle used at DRIE |
| Data Modelling Guide | A description of tools and techniques related to data modelling |
| Deliverables Reference Manual | Specifics of deliverables to be produced and signed off at each phase end of systems development at DRIE |
| Project Management Handbook | A handbook related to managing system development projects at DRIE |
| Analysis Guide | The methodology for conducting the analysis phase of a system development project at DRIE |
| Design Guide | The methodology for conducting the design phase of an information system development at DRIE |
| User Guide | A description of the role and responsibilities of the end-user in all phases of system development at DRIE |
| Database Design Guide | An overview of the steps and techniques involved in designing databases at DRIE |
| Strategic Data Planning Guide | A methodology for determining the data, applications and technology needed to support the business of DRIE |

3.0 DATA MANAGEMENT CENTRE (DMC) (cont'd)

3.3 DOCUMENTATION AVAILABLE IN DMC (cont'd)

| TITLE | DESCRIPTION |
|---|---|
| ADABAS/NATURAL | |
| NATURAL Standards and Techniques | Standards and techniques for designing, coding, testing and formating NATURAL programs |
| ADABAS Tutorial | A self-study course in ADABAS structures and usage |
| NATURAL Program Code Management System | A manual describing customized procedures for managing NATURAL source codes at DRIE |
| Information Resource Dictionary (IRD) | |
| Data Administration Introduction | An introduction to Data Administration and how it is accomplished at DRIE |
| Information Resource Dictionary Reference Manual | An explanation of general IRD design concepts, design details of the corporate IRD at DRIE, and standards for recording information about data and processes in the IRD |
| Manager Products Terminal Users Quick Reference Guide | Vendor-supplied reference card of IRD commands |
| IRMIS Users Guide | A guide describing the functions and processes front ending the DRIE IRD and their invocation procedures. |
| "Find That Data Element" | A pamphlet illustrating how to access and retrieve a data element from the IRD |
| Data Dictionary Reporting Handbook | An introduction into the flexibility and variety of reports available from the data dictionary |

3.0 DATA MANAGEMENT CENTRE (DMC) (cont'd)

3.3 DOCUMENTATION AVAILABLE IN DMC (cont'd)

| TITLE | DESCRIPTION |
|---|---|
| General | |
| ADABAS Utility Submission System Operations Manual | A manual describing customized procedures for submitting utility programs for maintenance of ADABAS files and databases |
| Introducing the Data Management Centre (DMC) and its procedures | A manual intended to acquaint users with what the DMC does and to serve as a guide to the facilities and services provided by the DMC |
| Manager Products Installation and Maintenance Standard Operating Procedures | A complete technical view of the activities associated with the maintenance of Manager Software Products |
| Writing Standard Operating Procedures | A standard approach and format for writing DMC operating procedures |

## 3.0 DATA MANAGEMENT CENTRE (DMC) (cont'd)

### 3.4 SOFTWARE SUPPORTED BY DMC

| VENDOR SUPPLIED | CUSTOM DEVELOPED |
|---|---|
| DATAMANAGER | IRMIS |
| CONTROLMANAGER | MARS |
| DESIGNMANAGER | USER-EXIT2 |
| ADABAS V4.1 | SCAN |
| NATURAL V1.2 | NATURAL SOURCE CODE MANAGEMENT |
| NATURAL SECURITY | ADABAS UTILITY SUBMISSION |
| NATURAL CONNECTION | IRDCS |
| SUPERNATURAL | HP-CONCENTRATOR* |
| TRIM | INTERFACE* |
| ADAMINT | |
| PREDICT 2.2 | |

* Under development.

## 4.0 PROCEDURES

This section outlines specific DMC procedures. The objective is to guide the user, as much as possible, in understanding what happens, when and why.

Each subsection contains a "mini" table of contents. These vary depending on the subject being described. Diagrams will be presented where applicable.

4.0 PROCEDURES (cont'd)

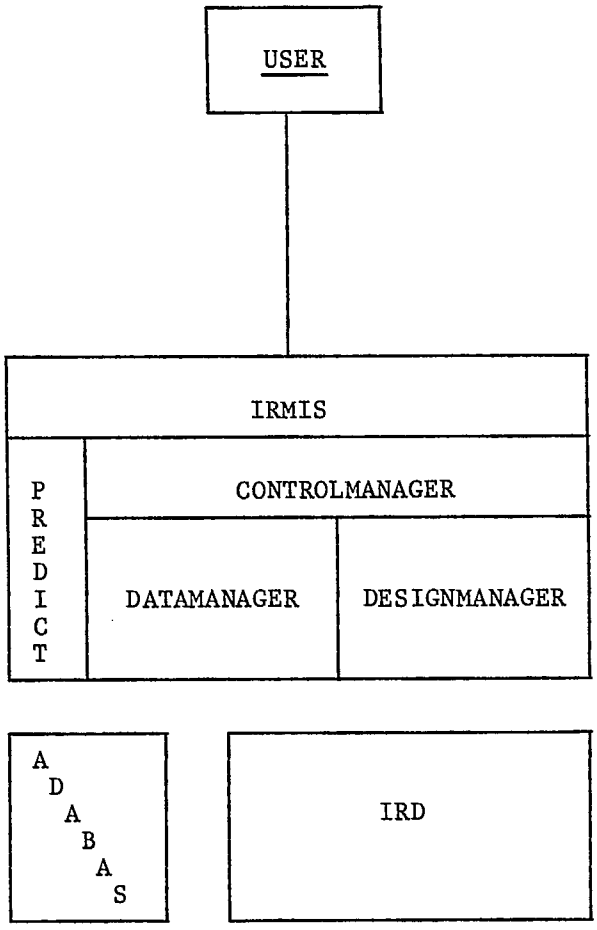
4.1 DATA DICTIONARY

Subsection Table of Contents:

4.0 PROCEDURES (cont'd)

4.1 DATA DICTIONARY (cont'd)

CORPORATE INFORMATION RESOURCE
DICTIONARY STRUCTURING



4.0 PROCEDURES (cont'd)

4.1 DATA DICTIONARY (cont'd)

I DATA DICTIONARY OVERVIEW

This section indicates some of the more common usages of data dictionaries in general and of DRIE's Information Resource Dictionary specifically. References are made to other DMC documents which provide details on how, when and who does what in support of "getting the job done". Because dictionaries are used for a variety of purposes at different points in time, this section will be presented in chronological order as closely as possible.

What is a Data Dictionary?

A data dictionary is a database which contains detailed information about the data used by an organization (i.e. metadata or data about data). For example, it could contain entries for all the data elements and files used in the organization's computer systems. Each data element's entry could include its name, a description and its characteristics, (i.e. how long is it, is it alphabetic or numeric, does it have a decimal point etc.). Data dictionaries are also commonly used as documentation tools. There may also be entries describing reports, programs, organizational units, functions etc.

Why Have a Data Dictionary?

At DRIE, the data dictionary that contains all corporate definitions and is used to support the integrated data environment is called the Information Resource Dictionary (IRD). The department has a corporate database which is shared by several corporate systems. **Because these systems all share data elements, it is crucial that there is no confusion in the interpretation of data.** Use of the IRD encourages the creation of precise and unique data definitions and aids to minimize data redundancy. **Used in a chronological fashion during systems development, the IRD can save time and money in subsequent phases. It also assists human communications.** The IRD also provides a facility for recording data usage information which is critical to change control activities (e.g. before changing the attributes of a field one must know ALL the programs, reports etc. which use the given field.)

When to Use the Information Resource Dictionary?

The IRD is used during systems development and enhancement projects to record information about the systems and all components. This stored information is queried and reported and is used as part of phase end documentation as per the DRIE SDLC.

4.0 PROCEDURES (cont'd)

4.1 DATA DICTIONARY (cont'd)

I DATA DICTIONARY OVERVIEW (cont'd)

Data Dictionary Within DRIE

At DRIE, there are three main dictionary software products in use; DATAMANAGER, PREDICT, and QDD. QDD is the dictionary used by the HP systems (DRIE's mini computer). It is used to support the IMAGE databases, and, at the present time, operates independently of other departmental dictionaries. PREDICT is the dictionary associated with ADABAS. ADABAS is the database management system (DBMS) used to run the corporate database. In order to use ADABAS, PREDICT must be present and must contain definitions of all database files and userviews as well as the groups and data elements contained within them. At DRIE the contents of PREDICT are also stored in DATAMANAGER. DATAMANAGER is the dictionary component of MANAGER software marketed by MSP Inc. MANAGER software also includes a modelling tool (DESIGNMANAGER) and an interactive front-end for all MANAGER software (CONTROLMANAGER). DATAMANAGER is the software base for DRIE's departmental Information Resource Dictionary. This central dictionary contains information about the corporate database, programs, systems, reports, dataflow diagrams, organizational units and many other things of interest to the department. It is the authority on metadata within DRIE. Presently (September 1987), studies are underway to determine more precisely the roles of the various dictionaries within the department's various information environments.

II PROCEDURES

Advice/Consultation Sessions

DMC personnel are available to answer questions and to aid users in the use of IRD. During this exercise, the user should make note of any questions which arise or areas that remain unclear. At this point, if necessary, meetings can be held with a DMC person to further clarify areas of difficulty and to provide advice on various aspects of IRD use. The user may also request a demonstration of dictionary capabilities and associated automated tools. For new development teams, where there is unfamiliarity with data management practices at DRIE, it is recommended that the project leader arrange an information session(s) for the whole team or individuals at the beginning of the project as appropriate.

4.0 PROCEDURES (cont'd)

4.1 DATA DICTIONARY (cont'd)

II PROCEDURES (cont'd)

Information Resource Dictionary Access Prerequisites

To access the Information Resource Dictionary, there are two (2) prerequisites: mainframe access and dictionary access.

To gain DRIE mainframe access, the user must first obtain a TSO account by submitting a request to the Technology Centre.

To gain dictionary access, the user must obtain dictionary logon id and password by submitting a DMC Work Request indicating TSO account and type of dictionary access required (e.g. read only, update, etc.).

Adding Information to Information Resource Dictionary

a) New Members and Naming Conventions

When a user wishes or is required to add information to the dictionary, there are several things which should be considered. (For the purpose of this section, we will assume the information to be added is a new entry as opposed to an update to an existing member.) First, consider the membertype being added (e.g. is it a data element, file, screen, etc.). The DRIE IRD is structured to accommodate 64 MEMBERTYPES. Refer to the MEMBERTYPE DEFINITIONS section of the IRD Reference manual to determine which membertype should be used. The above manual also describes the method for creating a name (the MEMBERNAME) and aliases for the new IRD members. Refer to the sections titled MEMBER NAME STANDARDS and ALIAS STANDARDS. Now the user must determine what information should be included with the new dictionary member. The mandatory and optional entries allowed for each membertype are listed in the MEMBERTYPE DOCUMENTATION STANDARDS SECTION of the IRD Reference manual. Refer to the section for the appropriate membertype.

- Use of Forms

Several forms are used to capture definitions to be added to the dictionary. These are kept in a large filing cabinet in the DMC area. Choose the forms which contain spaces for the attributes you need and fill them out. If you need assistance please see DMC personnel.

Note that, at this time, the IRD Reference manual does not list which form is for which membertype. This will be pursued by DMC in the future.

4.0 PROCEDURES (cont'd)

4.1 DATA DICTIONARY (cont'd)

II PROCEDURES (cont'd)

- Verification Process

When the forms have been filled in, they should be accompanied by a Work Request and brought to DMC for verification. DMC personnel, in dictionary area, who are familiar with DRIE's naming conventions and dictionary standards, will review the forms for completeness and adherence to standards. Once the material is approved for entry, it should be added by the user to the IRD.

- Dictionary Statuses

There are several IRD statuses which follow the SDLC at DRIE. These statuses are named 'PROPOSED', 'TEST', 'PRODUCTION' and 'MAINTENANCE'. For more details please refer to the IRD Statuses section of this manual.

- Data Entry

Data may be entered into IRD on-line or via batch job streams. DMC personnel will enter the data except when there is a large quantity of data to be entered, e.g. new application, major enhancement, etc. The current practice at DRIE is that the user will hire a temporary resource to do the data entry. DMC will, in this case, train the resource on how to do the online or batch dictionary data entry. To determine whether an additional resource is required please consult the Chief of DMC.

b) Existing Members

The second type of information which one may add to the IRD is a change or addition to an existing IRD member. It is one of DMCs goals to have a facility whereby users can do their own dictionary updates via a mechanism to ensure that these updates are within DRIE standards and guidelines. However, for the time being, all updates must be accompanied by a Work Request (see the section in this manual on Work Requests for details) and directed to the DMC area for verification and entry into the dictionary.

**Note: Some teams have staff who are knowledgeable with DRIE's dictionary and its standards. These individuals may not be required to go through the verification procedure.**

4.0 PROCEDURES (cont'd)

4.1 DATA DICTIONARY (cont'd)

II PROCEDURES (cont'd)

Getting Information Out of the Information Resource Dictionary

Manager Products (CONTROLMANAGER, DATAMANAGER, DESIGNMANAGER) have a command language which allows users to query the contents of the dictionary. The commands may be issued on-line or by a batch job. There is a "Terminal User's Quick Reference" card where all applicable commands and their syntax are explained. See your project leader or DMC personnel to find out how to obtain a reference card.

The user can retrieve information from IRD directly by using IRMIS or by submitting a Work Request for special information retrievals not supported by IRMIS.

IRMIS (Information Resource Management Information System) is a DMC custom-developed on-line facility. The major options of interest to the "hands-on" dictionary user are: (1) on-line dictionary execution; (2) batch dictionary execution; and (3) standard generated output and reporting. For more details please refer to the IRMIS section of this manual and the Data Dictionary Reporting Handbook.

The Data Administration Work Request is a form that may be used to request IRD information retrieval by DMC. Following are some examples of when this method may be chosen by the user:

° when information which is not included in a standard report is required;

° when the user does not know how to use IRMIS;

° when the needed information requires complex combinations of commands or the report to be produced is very expensive (i.e. when technical expertise is required to write a series of commands which will be most efficient and least costly);

For more details please see Work Request section of this manual.

Maintaining Information Resource Dictionary Content

Periodically, the DMC carries out maintenance tasks on the content of the dictionary. At these times, users will be given reports of various information contained in the IRD. The development teams and the user will be asked to verify that the information is correct and current. Cooperation in this area is solicited and appreciated. Remember that the usefulness of the dictionary is directly related to the accuracy of the information it holds.

4.0 PROCEDURES (cont'd)

4.2 DATABASE

The Corporate Database (CDB) is described in Section 2.4. The production and development environments are separated to ensure data security and integrity. The development and production databases are available for multiple, simultaneous access and update by means of the ADABAS multi-processing module (MPM). The MPM acts as a traffic controller for simultaneous batch and online access to the Corporate Database.

The daily production and development MPM's are controlled by an automated recovery system (MARS). Most database system failures are routinely recovered by the resubmission of the MPM job.

MPM is available to the user community as follows: (November 1987)

| Available | Unavailable |
|---|---|
| Weekdays: | |
| 7 a.m. to 10 p.m. | 10 p.m. to 12:00 p.m. - DBA maintenance |
| Midnight to 5 a.m. | 5 a.m. to 7:00 a.m. - DBA backups |
| Saturday: | |
| 7 a.m. to 5 p.m. | |
| Sunday: | |
| On request, must contact Production Control in advance | |

When the MPM is not available, DMC will notify project managers and it is the project managers' responsibility to inform their teams.

Known/scheduled downtime will be communicated to users in the coordination group meetings.

Development and production MPM's are "production systems". They are initialized and terminated, and made available through the Production Control area which is operated by the CSG FM team which reports to the Chief, Technical Services. DMC is just another user of these "production systems".

## 4.0 PROCEDURES (cont'd)

### 4.3 DATA MODELLING

I - OVERVIEW

Just as process analysis is required in the development of computer systems, so too is data analysis. Data analysis is primarily concerned with the structure of data to support "automated processes". Data modelling is a component of data analysis. There is a formalism associated with identifying and recording information about the data subjects (entities) and relationships between them. Two approaches to data modelling have evolved:

top down entity-relationship modelling, and
bottom up userview synthesis.

The techniques are complementary and often coexist. Regardless of approach, the information is recorded in the departmental information resource dictionary. This information is massaged by software and produces logical data relations that can be presented in graph form. The logical data relations are required in the creation of physical databases.

II - PROCEDURES - (currently under review)

DMC does not propose procedures for requesting data modelling per se. DMC will be proposing procedures for entry and retrieval of data modelling related information from the IRD.

To date, DMC has participated in system development specifically from a data and/or database orientation. From time to time, DMC has resolved certain anomalies related to data structure that were raised by committees or support teams. DMC has participated in system reviews and has undertaken independent studies related to data structures. Materials have been recorded in the IRD. The contents of the IRD relevant to data models can be "designed" by DESIGNMANAGER software to produce current data relations. As new information is recorded, the "design" process can be invoked and more up-to-date data relations produced. This is an iterative approach to the creation of a corporate data model, but it is considered most practical for DRIE.

Specific procedures as to what must be input to the IRD and how the "designed" outputs can be retrieved are being worked on. Contact DMC for the latest information in this area.

4.0 PROCEDURES (cont'd)

## 4.4 DMC WORK REQUEST *** (Currently under review) ***

Subsection Table of Contents:



### OVERVIEW

In order to provide a consistent method of requesting and documenting work related to data management, a standard form is used. All work to be done by DMC personnel must be requested via the Data Administration Work Request.

### WHAT IS WORK REQUEST (WR)?

A WR form example is included in Appendix B.

A WR has 3 copies:

(1) White: filled in by the user, updated by the DMC staff re work done and upon completion, filed with supporting documentation in DMC;

(2) Yellow: kept in the office of Head, DD/Data Modelling, DMC. Contains the name of person to whom the WR was assigned/ forwarded to and the date this was done. Users are encouraged to use this as a log to find out who within DMC has the WR. This copy is returned to the user upon completion of the WR;

(3) Pink: retained by the user after submission of the WR to DMC.

### HOW TO FILL IN A WR

The form itself is self explanatory. The user must fill in the top identification section and the "Description of Work". It is essential to be as precise as possible. If you are unable to fill in the form or the request is complex, seek DMC assistance.

4.0 PROCEDURES (cont'd)

4.4 DMC WORK REQUEST (cont'd)

WR STEPS

| STEP | WHO | WHAT |
|---|---|---|
| 1 | User | ° Fill in the WR<br>° Bring the WR to DMC and deposit into the IN BASKET of the Head, Data Modelling (DM) (Bruce Gale, Nov. 1987) |
| 2 | DMC Head DM | ° Analyze the WR and assign to the appropriate DMC staff (DD or Database)<br>° Record person assigned to, date and time on the yellow copy<br>° Put the yellow copy on the wall |
| 3 | Assigned DMC Staff | ° Do the required work<br>° Document what was done on the white copy |
| 4 | Assigned DMC Staff | ° Forward the white copy to other DMC area(s) as required (e.g. Database)<br>° Update the yellow copy: record person sent to, date and time |
| 5 | Assigned DMC Staff | ° Upon the completion of the WR, file the white copy and the supporting documentation in DMC<br>° Notify the Head DM about the completion |
| 6 | DMC Head DM | ° Notify the user upon completion and return the yellow copy. Note: if assigned DMC staff notifies the user about the completion, then this must be marked on the yellow copy and the Head DM still returns the copy. |

4.0 PROCEDURES (cont'd)

4.4 DMC WORK REQUEST (cont'd)

EXPECTED NUMBER OF DAYS TO COMPLETE BY TYPE

| WR TYPE | EXPECTED NUMBER OF DAYS* |
|---|---|
| New ADABAS userview | 2 |
| New ADABAS file | 3 |
| Change ADABAS userview | 2 |
| Change data element/group description | 1 |
| NATURAL security access | 2 |
| Delete userview | 3 |
| Add new status | 1 |
| Delete old status | 1 |
| Transfer of data from status to status | 2 |
| Enter new member (with attached forms) | 1 |
| Request for special reports | ** |
| Request for standard report | 1 |
| Request for IRMIS modifications | ** |

WR TYPES

The flowcharts in Appendix A are intended to show what is involved in performing the work requested of DMC.

* These are nominal estimates based on experience. Any specific request may vary from this estimate.

** Depends on complexity of request.

4.0 PROCEDURES (cont'd)

## 4.5 INFORMATION RESOURCE DICTIONARY (IRD) STATUSES

Subsection Table of Contents:



### OVERVIEW

Status can be considered as a userview of the IRD. Several statuses may be defined. Each status may contain any and all of the membertypes defined to the IRD. Within a specified status, all components of some common interest can be collected and manipulated independently of the contents of any other status. For example, a status could be created to contain members associated with system ABC, that is, all programs, files, reports, screens, data elements, etc. Similarly, a status could be created to contain all members associated with the analysis phase of system XYZ. This could contain logical data flows, data stores and processes. These two statuses would co-exist within the IRD but would be separate from each other. Contents of each can be modified independently.

1. IRD Statuses

Currently, the Information Resource Dictionary contains several statuses which align with the system development life cycle. There are a series of "PROPOSED" statuses for use with new system development projects and major changes to existing systems which involve new members.

Once the development project requires access to database userviews, all members are moved from the "PROPOSED" status to "TEST" status. The majority of system development and testing is based on information contained in the "TEST" status.

When testing has been completed and the system is determined to be suitable for production, all members for that system are moved to the "PRODUCTION" status. All members contained in "PRODUCTION" are READ ONLY. The "MAINTENANCE" status is used for making changes to members currently in "PRODUCTION". These changes are not reflected in the "PRODUCTION" status until the IRD controller executes privileged utilities. This results in the replacement of the member in the frozen "PRODUCTION" status with the definition of that member from the non-frozen "MAINTENANCE" status.

Members contained in the frozen "PRODUCTION" status can be viewed from all non-frozen statuses.

4.0 PROCEDURES (cont'd)

4.5 INFORMATION RESOURCE DICTIONARY (IRD) STATUSES (cont'd)

2. Transferring Members Between Statuses

Members are transferred between IRD statuses by DMC personnel. All such transfers require a DMC Work Request.

**The transfer to "PRODUCTION" is done once per week, currently Wednesday evening. To be considered for this transfer, materials and accompanying Work Requests must be received by DMC before 5:00 p.m. Tuesday.**

All other transfers are normally turned around within 24 hours.

## 4.0 PROCEDURES (cont'd)

## 4.6 INFORMATION RESOURCE MANAGEMENT INFORMATION SYSTEM (IRMIS)

Subsection Table of Contents:



### OVERVIEW

IRMIS is a system developed by the DMC to provide direct user access to a variety of DMC supported functions without DMC intervention. The system is intended to be used by the users to formulate and submit their own inquiries related to the entry, retrieval or maintenance of data.

The options currently available through IRMIS provide:

- online and batch access to the IRD;
- reports from the IRD;
- NATURAL Source Code Management System; and
- access to SPF edit and job submission.

Procedures for using IRMIS are outlined in the IRMIS USERS GUIDE which is available from the DMC. The existing IRMIS options are those which were developed to respond to the most pressing user requirements. **Suggestions for new options, or changes to existing options, are welcomed by DMC.**

### CONSIDERATIONS

IRMIS is largely a menu driven DIALOGUE MANAGER system. However, part of IRMIS is the online execution of DATAMANAGER against the IRD. As with other software packages, some user expertise is required. MSP (Manager Software Products) command cards are available from your project manager to assist with the use of DATAMANAGER and CONTROLMANAGER. The most common commands have been included in the IRMIS USER GUIDE. The user is also encouraged to refer to IRD documentation available in DMC. Training sessions will be scheduled if requested and information will be given on an individual basis to address specific user needs. The Data Dictionary Reporting Handbook demonstrates many of the reports and queries available through IRMIS.

4.0 PROCEDURES (cont'd)

4.6 INFORMATION RESOURCE MANAGEMENT INFORMATION SYSTEM (IRMIS) (cont'd)

REQUIREMENTS

| WHAT | OBTAINED FROM | COMMENTS |
|---|---|---|
| TSO User-id | Technology Centre | |
| Allocate data set to the TSO session | n/a | DSN=RYEPL1.IX029. CLISTLIB.PROD |
| Online and batch execution of the Information Resource Dictionary | DMC | Obtain CONTROLMANAGER user-id and password |
| Online execution of the Information Resource Dictionary | n/a | Allocate a region of 2048K for the TSO session e.g. LOGON RYEXXXXX SIZE (2048) |
| ADABAS Userview Charts | 1. Technology Centre | Obtain H.P. 3000 user-id |
| | 2. DMC | Plotter Request Form |

## 4.0 PROCEDURES (cont'd)

## 4.7 NATURAL SECURITY

Subsection Table of Contents:



### OVERVIEW

NATURAL Security is a vendor-supplied software package which is currently used with all ADABAS databases at DRIE. It allows the NATURAL Security Administrator to restrict the access to:

- database(s);
- applications accessing the database(s);
- userviews of ADABAS files;
- NATURAL commands.

### COMPONENTS OF NATURAL SECURITY

#### Applications

An application contains all the source and object modules for a system or subsystem. Systems with modules of similar function are generally contained in one application. Systems with a large number of modules, or a diversity of function and access requirements, use more than one application. Each application has a separate security definition. All applications are people and profile protected. People protection means that the application can only be accessed by specified users. Profile protection varies and includes the ability to limit or eliminate command mode, the use of NATURAL statements and/or the execution of update programs.

Applications have defined STARTUP and ERROR transactions. These are programs that are automatically invoked by NATURAL SECURITY on initial logon to an application or during an error condition.

## Files

For security purposes, a file is defined as a specific userview of an ADABAS file. All userviews must be defined to NATURAL SECURITY. Subsequent to definition, each userview must be linked to those applications which require access. A userview may be linked as read only or update. When a LIST FILES command is issued, only userviews to which the application is linked will be displayed.

## Users and Groups

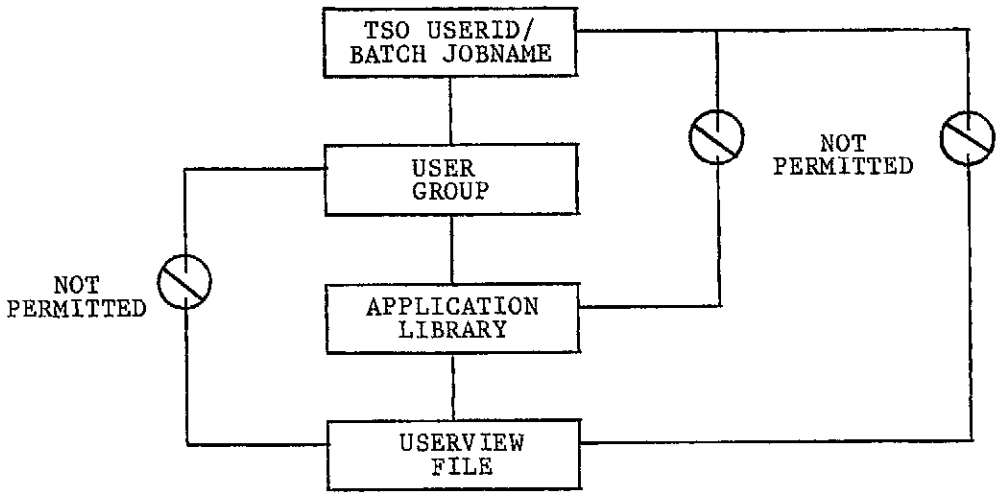
Each TSO userid and batch jobname requiring access to an ADABAS database must be defined to NATURAL SECURITY as a user of that database. All users are then defined as members of groups. A group is a collection of users having identical access requirements. Groups are then linked or authorized to applications (see diagram below).

## LINKS AND AUTHORIZATIONS

When a user group is **linked** to an application, the security profile in effect for the NATURAL session is the security profile of the **application**. If no NATURAL commands are allowed in the application, the members of the user group will not be able to issue NATURAL commands.

When a user group is **authorized** to an application, the security profile in effect for the NATURAL session is the security profile of the **group**. If the security definition of the user group permits the use of NATURAL commands, then the group will be permitted to issue those commands whether or not the security profile of the application permits the use of NATURAL commands.

## NATURAL SECURITY LINKAGE STRUCTURE IMPLEMENTATION



## SETTING UP NATURAL SECURITY REQUIREMENTS

The system support teams' involvement with NATURAL SECURITY consists of:

a) Development requests, being those which would be involved in setting up an entirely new system on the Corporate Database.

b) Maintenance requests, being those which identify to NATURAL SECURITY changes in the day to day operating environment of systems already defined to Security.

### Development of New System

Development teams working on new systems which require access to the Corporate Database are required to define their SECURITY requirements to the Data Management Center before access to the database will be possible. An application library name on the database will be assigned by DMC. This name will be based on the two character system code assigned by the Departmental Information Resource Dictionary. The following information is necessary to set up NATURAL SECURITY for a new system:

- All userviews required for system development must be listed and access identified as either read only or update.

- All TSO userids and batch jobnames which will be used by the system must be listed. Each must also be identified as belonging to a member of the development team or to an end user of the system. This will allow security groups to be set up to permit appropriate levels of access to the database. Please note that batch jobnames may be identified as a range (i.e. all batch jobs with the userid ryexxxx and any suffix).

- If the requirement exists for the new system to link with systems currently on the database, the names of all the applications to which linkage is required must be included. Approval from the custodians of those applications is necessary in order to establish security links to existing systems.

A Data Administration Work Request form must be submitted for access to the development database. A separate work request is required to gain access to the production database. This may be simply a request to duplicate the security profile from the development database or, where appropriate, changes should be made to limit the number of development team members accessing production.

**A minimum of two working days must be allowed for a work request of this type.**

Maintenance of Existing Security

Once a system's security profile is defined to NATURAL SECURITY, changes are necessary when new TSO userids, batch jobnames, application linkages or userviews of files are required.

**TSO USERIDS AND BATCH JOBNAMES** - A work request must be submitted outlining the new names, the level of access required and the database to which the request pertains (i.e. database = development, system = system name, TSO userid = ryeplxx, access = development team access)

**APPLICATION LINKAGES** - A request to link users of one system to the application libraries of another system requires approval from a delegated authority for each system.

**USERVIEWS** - When access to an existing userview is required, the request for change to NATURAL SECURITY should be included as part of the work request to have the userview added to the system directory. Also, the work request must contain permission to access that userview from the custodian of that userview. In the case of new userviews, the NATURAL SECURITY information should be included as part of the work request to create the userview. The type of access, read only or update, must be included on all work requests relating to userviews.

The most common maintenance requests concern access to new userviews, changed access to userviews, and the addition of new TSO userids.

The time to complete security-related work requests varies according to the amount of work involved in the non-security aspects of the work request. Please refer to the Work Request section in this manual.

## 4.8 NATURAL SOURCE CODE SCAN PROGRAM

### OVERVIEW

The SCAN is a DRIE custom-developed facility used in conjunction with the Departmental IRD. It scans NATURAL source code being transferred from development to production and records information concerning the usage of data and files by NATURAL programs.

The information derived by the SCAN will update the following sections of the IRD:

1) Userview files used by program, and whether these files are used for read only or update.
2) Data elements used by program.
3) Other programs called by program being scanned.
4) Screens used in program being scanned.

The SCAN ensures that impact analysis information is consistent and timely.

### PROCEDURE

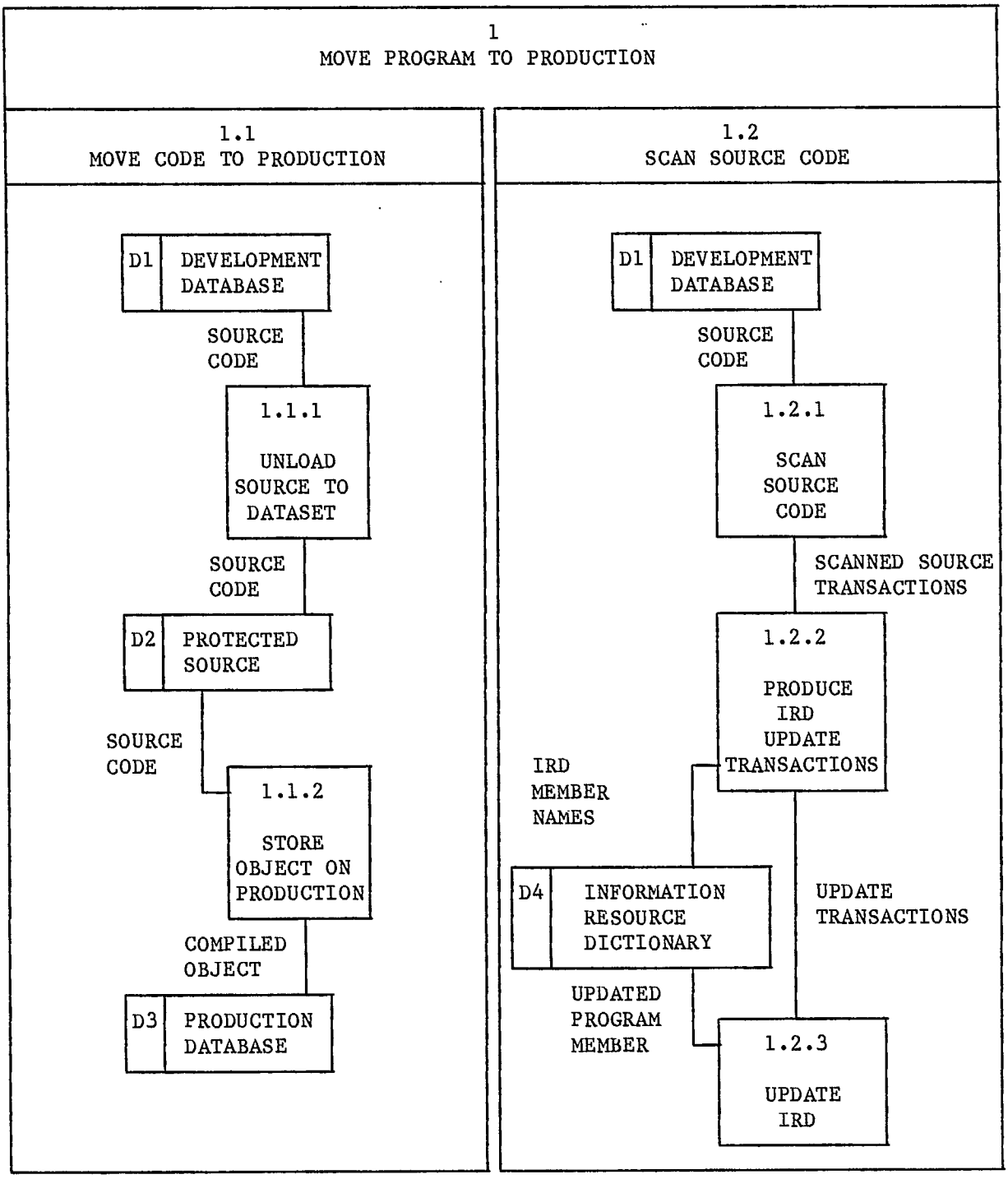
Before using the SCAN, an IRD AUTHORITY code, available from DMC, is required.

The SCAN is invoked by the application teams directly from the main menu of IRMIS option 3, "Natural Source Code Management". IRMIS is described in this manual. Additional details can be found in the IRMIS USERS GUIDE, also available from DMC.

The NATURAL Source Code Management System also provides options which submit a job to SCAN programs without copying the programs to production.

All jobs to SCAN source code run independently of the job submitted to copy the program to production. If the program is copied to production during the day, the SCAN job for that program will be run at night. The failure of the SCAN to run correctly will in no way affect the program load. A diagram on the next page illustrates the process.

NATURAL PROGRAM SCAN, DATAMANAGER UPDATE AND SOURCE CODE STORAGE



## LIMITATIONS OF THE SCAN PROCESS

- In order to SCAN a program, **the program must first have been identified to the Information Resource Dictionary.** Only basic information concerning the program must be entered before it can be scanned.

- **All screens and NATURAL programs** referred to in the program being scanned **must also have been identified to the IRD.**

- The SCAN facility can **only provide information on userviews used** by the program. **No work files** written by the program **will be updated** by scanning.

- **NATURAL screens cannot be scanned.** Due to the fact that NATURAL screens input variables as opposed to actual database fields, the SCAN is unable to capture screen information.

- **No indirect calls will be picked up** by the SCAN. An indirect call is when another program is stacked or fetched using a variable name as opposed to hard coding the called program name.

- **All NATURAL programs** to be scanned **must be compilable.** This means they must contain no syntax errors or references to database fields not currently on the database.

- Only NATURAL **source programs resident on the DEVELOPMENT database** can be scanned.

- When **several programs** are to be scanned at one time, they **must be in the same application library** on the database.

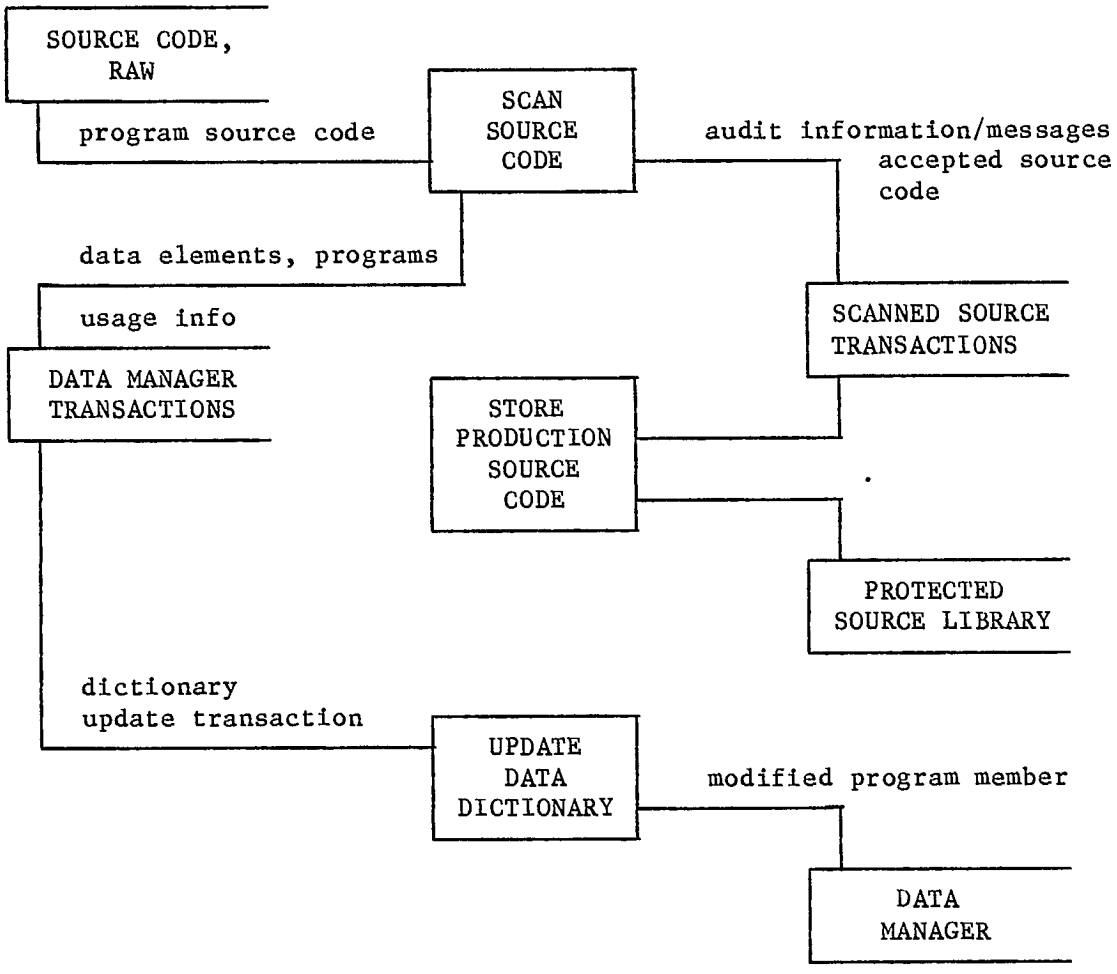
- The facility is provided to SCAN a range of programs in one job. However, it is **strongly recommended that no more than 20 programs** be scanned **in one job.**

- **No programs using global variables** to indicate userviews and field information can be scanned as the SCAN program cannot determine the file information from source code of this type. (i.e. find &filename with &fld1).

4.0 PROCEDURES (cont'd)

4.8 NATURAL SOURCE CODE SCAN PROGRAM (cont'd)

NATURAL PROGRAM SCAN, DATAMANAGER UPDATE AND SOURCE CODE STORAGE

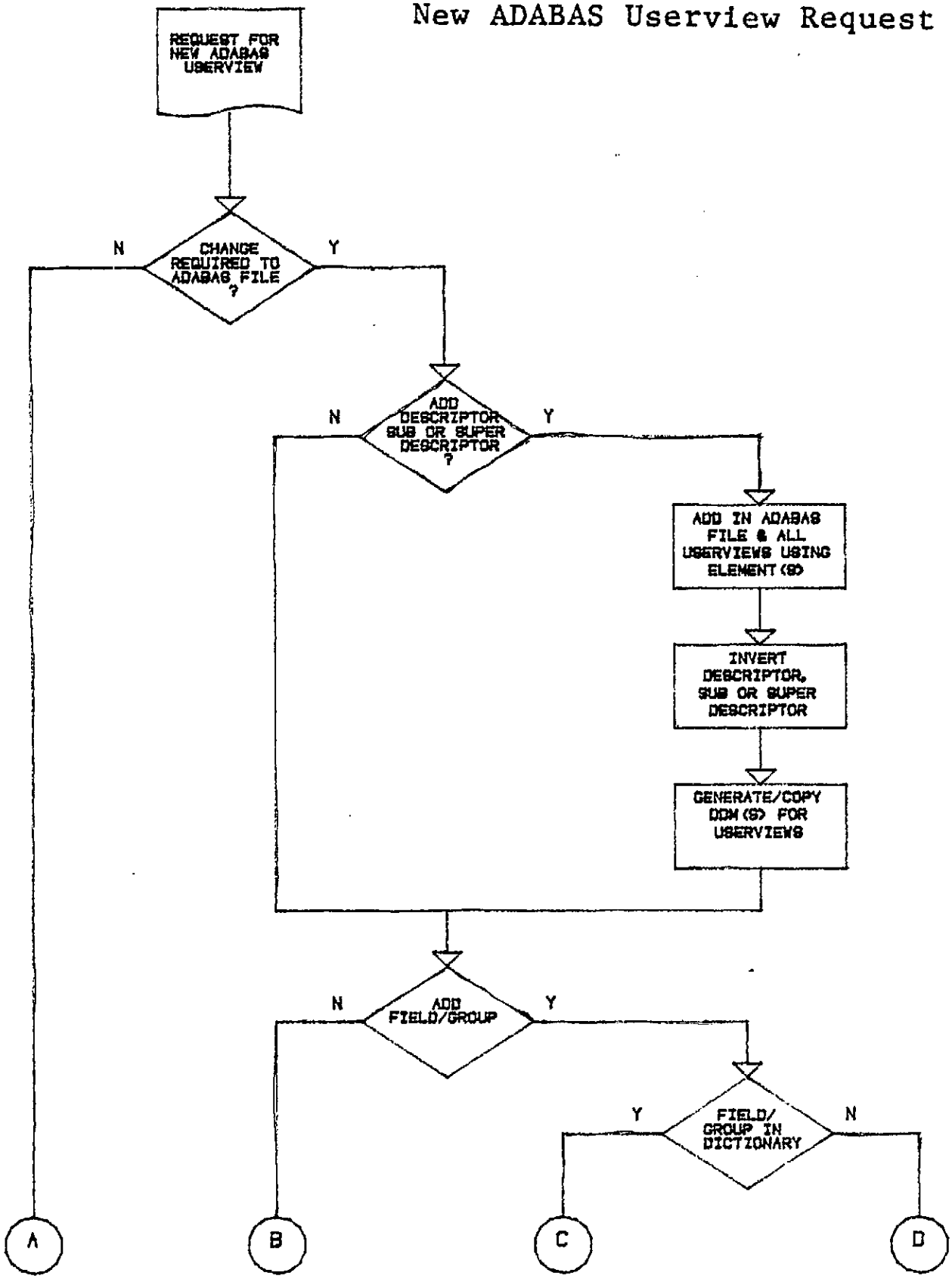


# APPENDIX A

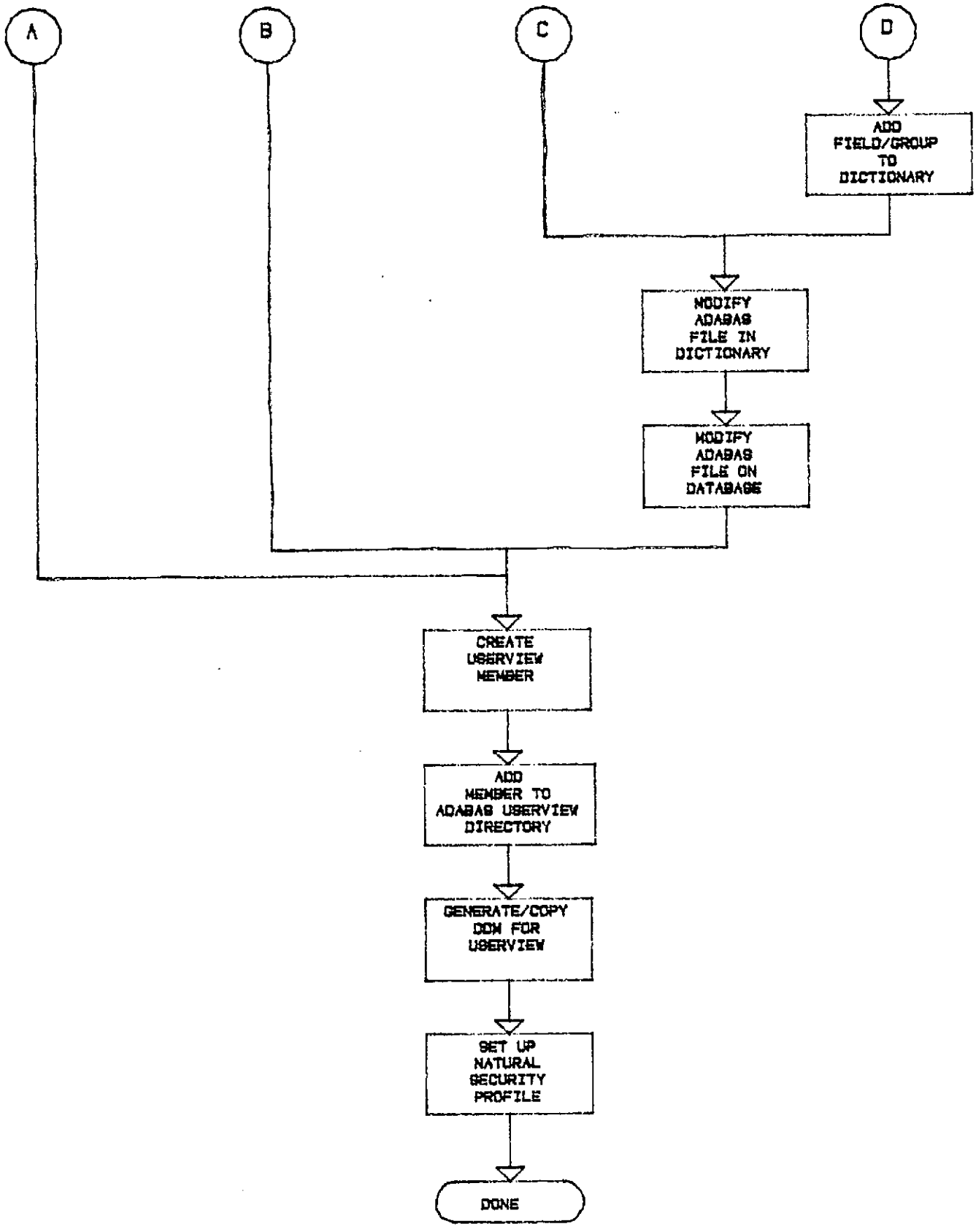
## WORK REQUESTS

1. New ADABAS Userview Request
2. New ADABAS File Request
3. Change ADABAS Userview Request
4. Data Element or Group Description Change Request
5. NATURAL Security Access Request
6. Delete ADABAS Userview Request

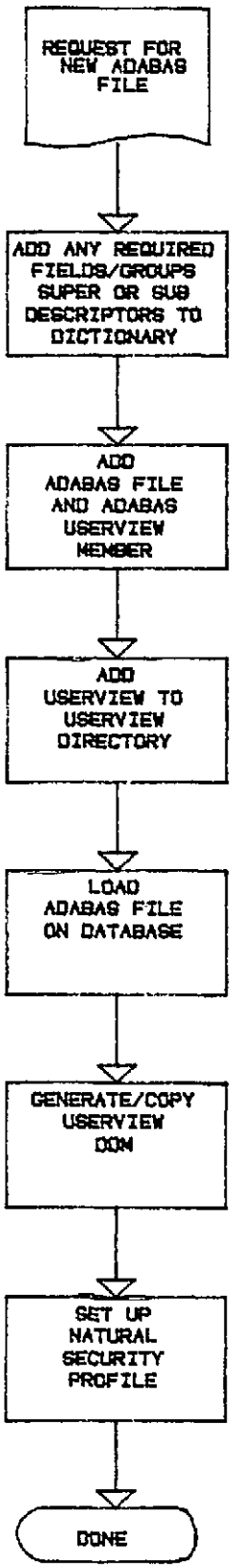
# New ADABAS Userview Request



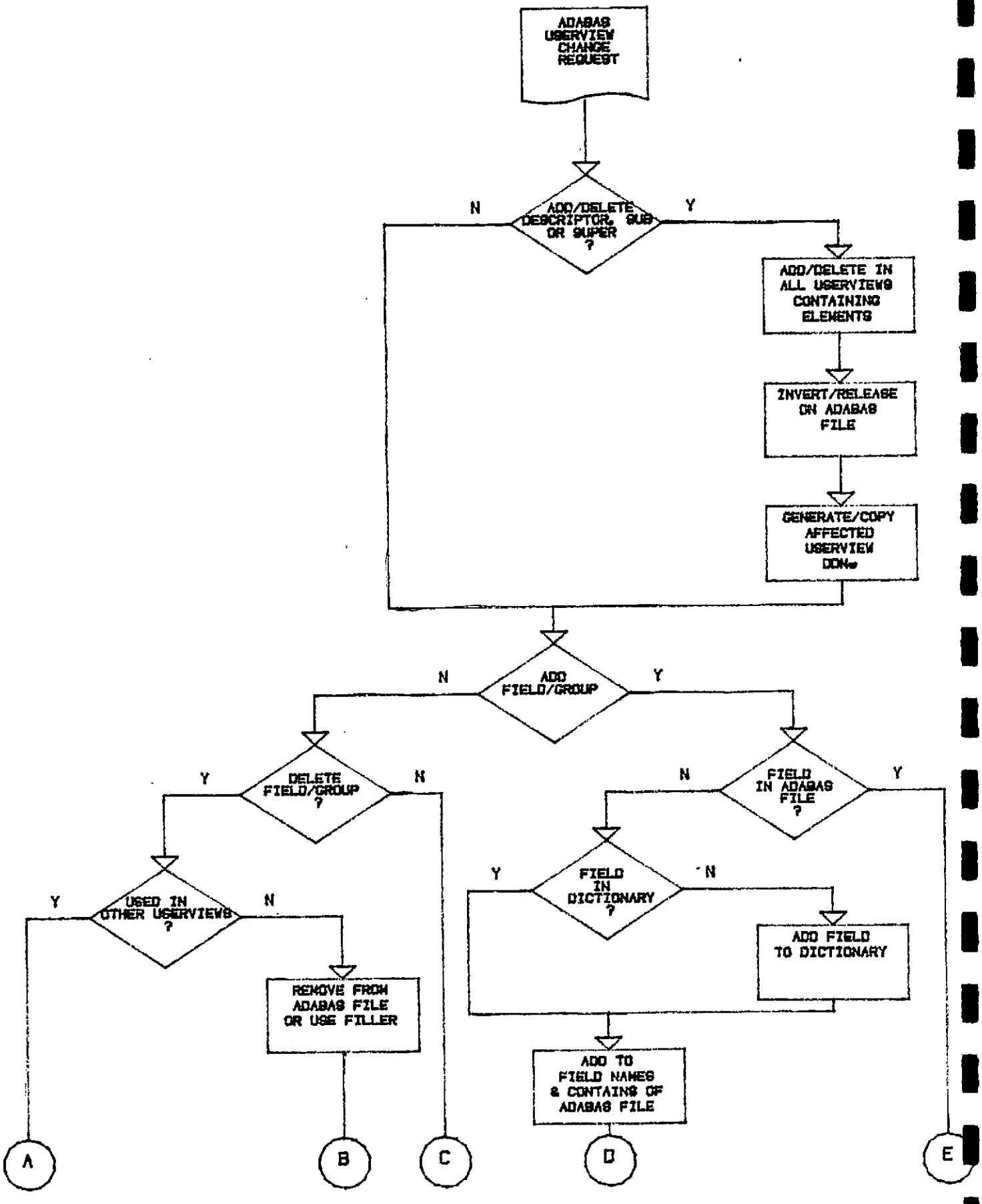
# New ADABAS Userview Request



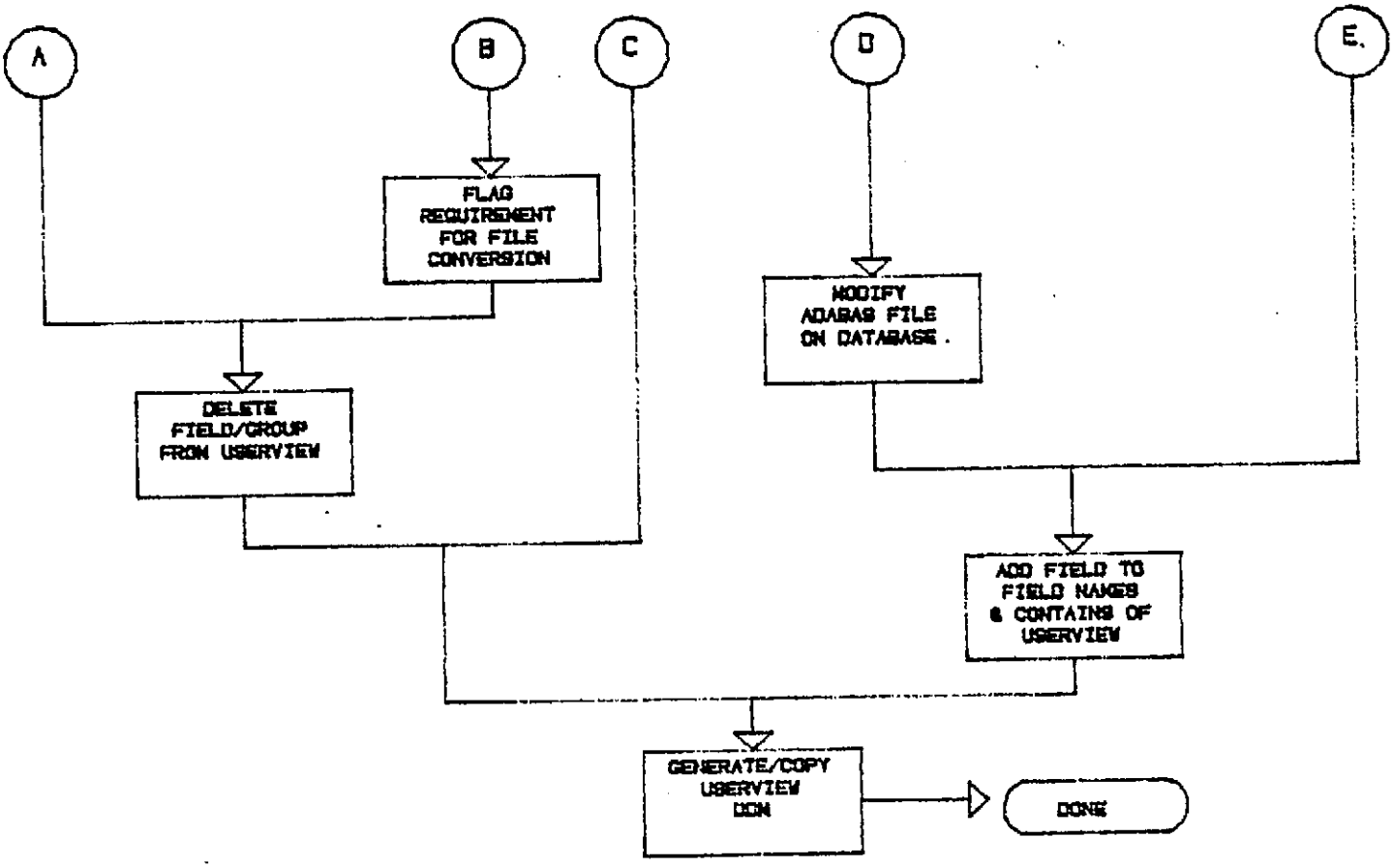
# New ADABAS File Request



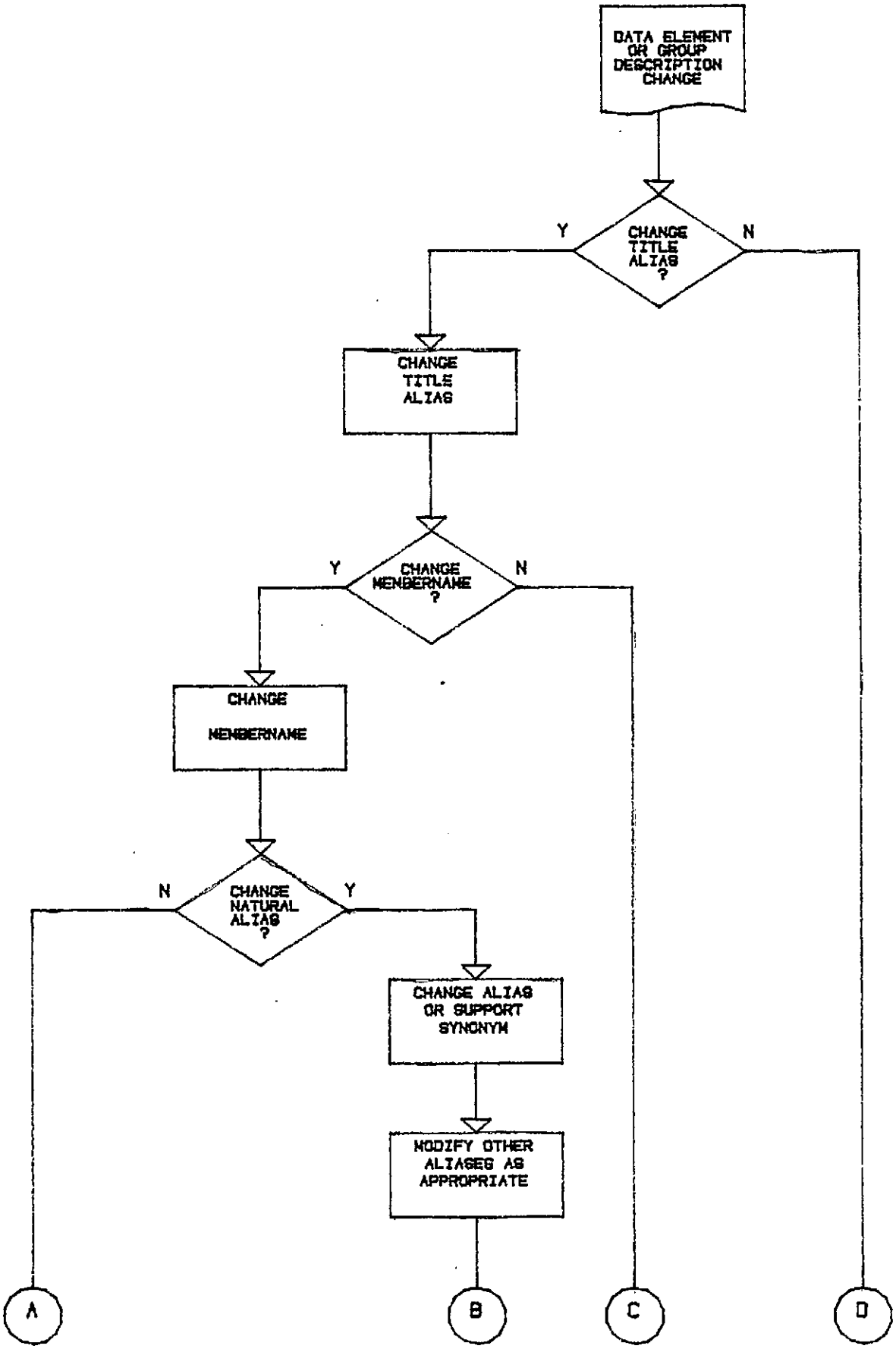
# Change ADABAS Userview Request



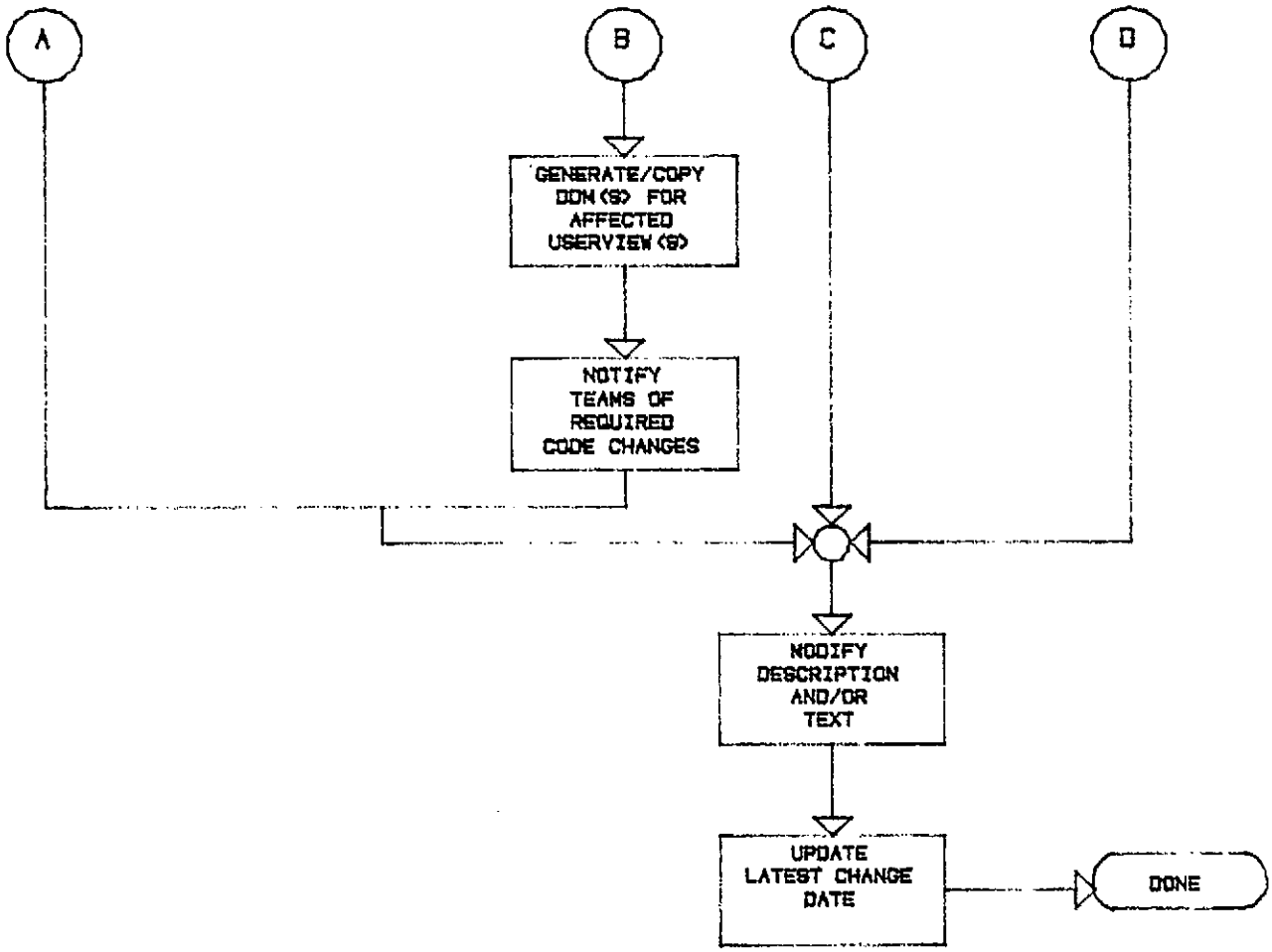
# Change ADABAS Userview Request



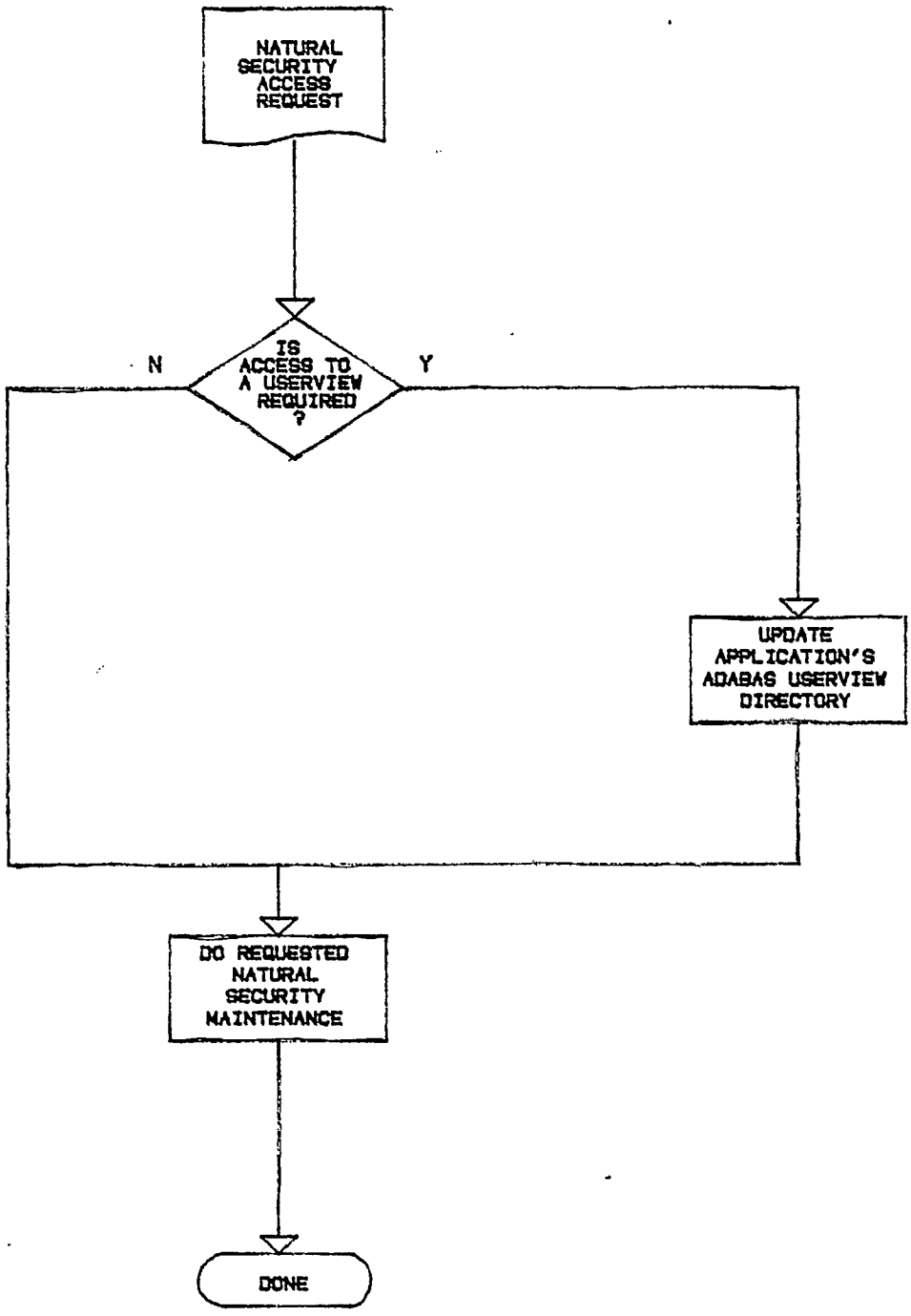
# Data Element or Group Description Change Request



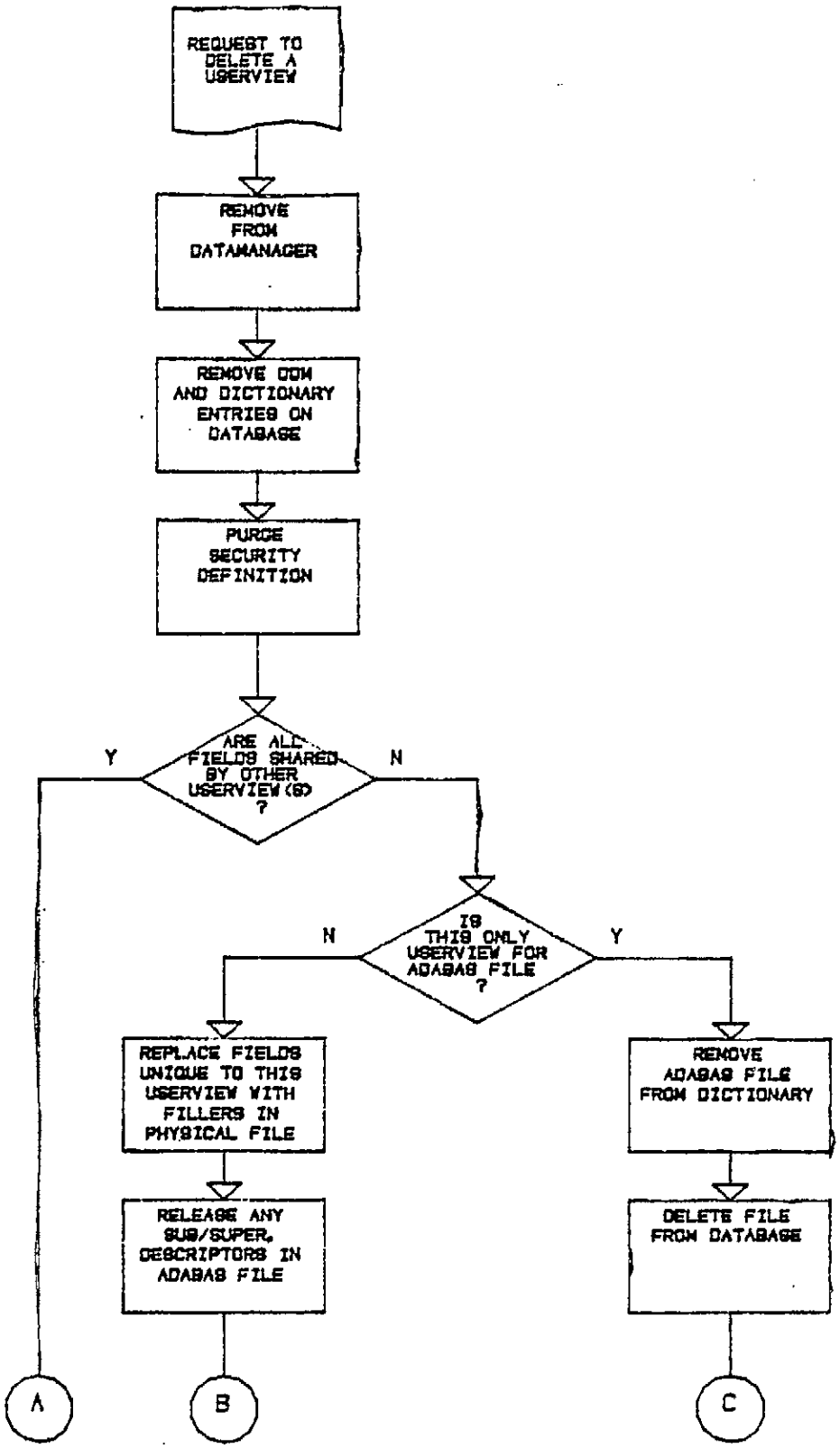
# Data Element or Group Description Change Request



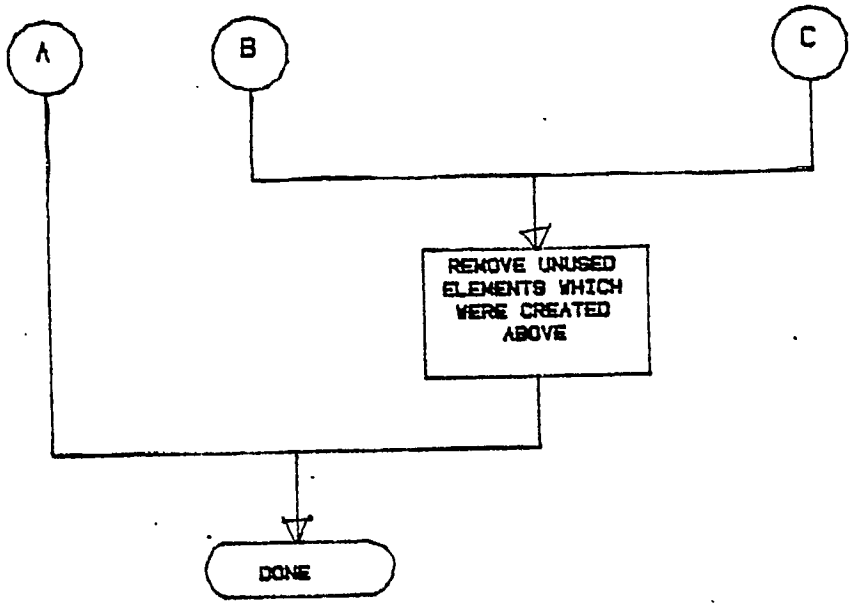
# NATURAL Security Access Request



# Delete ADABAS Userview Request



# Delete ADABAS Userview Request



## APPENDIX B

## FORMS TO BE USED

(e.g., WORK REQUEST)

Government of Canada / Gouvernement du Canada

Regional Industrial Expansion / Expansion industrielle régionale

**DATA ADMINISTRATION**
**WORK REQUEST**

**ADMINISTRATION DES DONNÉES**
**DEMANDE DE TRAVAIL**

| Submitted by – Présenté par | Application ID – Nom de l'application | Tel. No. – N° de tél. | Environment – Environnement ☐ Production ☐ Development Développement |
|---|---|---|---|
| Accounting information – Information comptable | | D.M.C. use only – Pour l'usage du C.G.D. Request No. – N° de la demande | 2714 |

**Description of work – Description du travail**
Attach completed data dictionary forms – Joindre les formules remplies du dictionnaire de données

| Project leader approval – Approbation du directeur de projet | Date |
|---|---|

**Comments – Observations**
Data Modelling – Modélisation

| Date received – Reçu le | Completed by – Rempli par | Date |
|---|---|---|

**Comments – Observations**
Data Dictionary – Dictionnaire de données

| Date received – Reçu le | Completed by – Rempli par | Date |
|---|---|---|

**Comment – Observations**
Date Base – Base de données

| Date received – Reçu le | Completed by – Rempli par | Date |
|---|---|---|

**Comments – Observations**
Security – Sécurité

| Date received – Reçu le | Completed by – Rempli par | Date |
|---|---|---|

1 **Completed by Data Administration & originator, retained by Data Administration**
**À remplir par l'Administration des données et l'initiateur, à retenir par l'Administration des données**

DRIE 171(11/85)