

# ADABAS

March 2004

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# 1 INTRODUCTION

This document contains the specific policies, procedures, standards, and guidelines for the use of ADABAS, a database management system (DBMS), at the State of Hawaii, Executive Branch's central-site information processing center. General policies, procedures, standards, and guidelines for the use of a database management system (DBMS), at the State of Hawaii, Executive Branch's central-site information processing center can be found in IT Standards 06.00 Database and Data Dictionary Overview. All database administration functions and facilities for State owned or State controlled data are centrally controlled and supported by the Department of Accounting and General Services (DAGS), Information and Communication Services Division (ICSD). The standards are based on the experiences of many State users and other organizations that have developed ADABAS standards.

ADABAS is an acronym that stands for "ADAPtable data BASE system." It is a product distributed by Software AG (SAG). This DBMS was purchased and installed at the State of Hawaii in June 1974.

This document is organized into the following six sections.

1. Introduction – which is this section and provides an overview of the standard.
2. The Database Environment - defines the basic concepts and objectives of database management as well as the environment that exists at ICSD.
3. Database Administration - describes the State's policies and allocation of duties and responsibilities as regards to database management.
4. Meta-data - describes the state's policies and objectives for the retention and use of meta-data within the PREDICT data dictionary.
5. System Design and Development - provides standards to be followed for the design and development of application systems within the ADABAS environment.
6. Security - provides information and standards concerning the security features of the ADABAS and NATURAL environments.
7. Programming - provides standards for programming applications in the ADABAS environment.

## 1.1 Purpose

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The purpose for this document is to provide rules for the use of ADABAS within state government. The standards will enable the user agencies in the Executive Branch to have uniform and consistent procedures for the effective sharing of the State's data resources in order to better serve the people of Hawaii.

This document provides guidance for computer programmers, data processing systems analysts, contractors, and consultants who must develop, test, and install programs, systems, and/or job streams that use ADABAS in State controlled computers.

### 1.2 Scope

This document assumes that the reader has a working knowledge of ADABAS. It does not contain information that may be obtained from the Software AG publications that are available from the manufacturing vendor.

Technical manuals for all Software Ag products such as ADABAS and NATURAL can be viewed over the Internet. A ServLine24 ID is required for access. To get an ID, send an email to request for a new ID to: [wecare@softwareagusa.com](mailto:wecare@softwareagusa.com)

The web sites to view the Software Ag products is follows:

<http://servline24.softwareag.com/SecuredServices/>

Technical manuals for all CA products can be viewed over the Internet. In order to access the manuals, a Support Connect ID must be obtained using the State of Hawaii account number: 101263. The web site to get the Customer Connect ID is: <http://supportconnect.ca.com/sc/index.jsp>

The web sites to view the CA reference documents and technical manuals are as follows:

CA APAS: [http://support.ca.com/apas\\_space\\_supp.html](http://support.ca.com/apas_space_supp.html)

The web sites to view the reference manual for Treehouse products such as PEEK and SECURITRE is follows: <http://www.treehouse.com/proddownld.asp>



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### 1.3 Applicability

State computer programmers and data processing systems analysts and any contractor and vendor must follow the standards, procedures, conventions, and guidelines presented in this document, or consultant hired by the State or who use the State's mainframe computing resources at the ICSD central site.

Failure to follow these procedures, standards, conventions and/or guidelines might result in computer systems error messages or unpredictable results and may result in delays and/or cancellation of the program or job stream.

### 1.4 Comments And Suggestions

Any State of Hawaii Information Technology Standards document, reference manual or users guide mentioned in this document are available through the departmental user agency data processing coordinator (DP Coordinator). Standards are also accessible on-line by clicking on [Information Technology Standards](#) on the [ICSD](#) home page at:

<http://www.hawaii.gov/icسد/>

Statewide Forms are accessible on-line by clicking on [Forms Central](#) on the [Government in Hawaii](#) home page at:

<http://www.ehawaii.gov/government/html/>

Any comment, recommendation, proposal, or suggestion regarding the contents or presentation of this document may be sent either via internet email to [icsd.admin.ppmo@hawaii.gov](mailto:icsd.admin.ppmo@hawaii.gov) or in writing to:

Information and Communication Services Division  
Project Planning and Management Office  
1151 Punchbowl Street, B10  
Honolulu, Hawaii 96813-3024

## 2 DATABASE ENVIRONMENT

The database environment established at the State of Hawaii Executive Branch central-site data processing center is covered in IT Standard 06.00 Database/Data Dictionary Overview.



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### 2.1 ICSD'S ADABAS Environment

The State's central processing center currently supports the following ADABAS databases on three IBM mainframe computers running under MVS/XA.

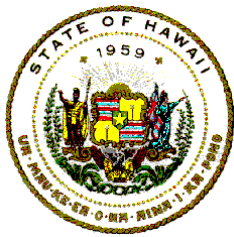
#### 2.1.1 ADABAS Databases

The following table lists the State's ADABAS databases, their locations, and their Natural language access transaction identification codes.

Data Base ID	Description	Owner	Host	Region	NATURAL Trans ID
DB6	Test/Development Database	AG, DCCA, DHS, DOT, DOTAX	B	CICSV8T	XWNA
DB9	Test/Development Database	DOTAX	B	CICSVGT	XWNA
DB10	Test/Development Database	DLIR	B	CICSV4T	XWNA
DB11	Test/Development Database	DLIR	B	CICSV2T	XWNA
DB12	Test/Development Database	DLIR	B	CICSV6T	XWNA
DB13	Test/Development Database	DLIR	B	CICSVDT	XWNA
DB19	Test/Development Database	DLIR	B	CICSVET	XWNA
DB21	HAWI Production Database	DHS	F	CICSH1	KWN1
DB23	HAWI Development Database	DHS	F	CICSH2	KWN2
DB25	HAWI Test Database	DHS	F	CICSH3	KWN3
DB27	HAWI Training Database	DHS	F	CICSH4	KWN4
DB29	HAWI Installation Database	DHS	F	CICSH5	XWNA
DB41	KEIKI Production Database	AG	G	CICSK1	NS41
DB43	KEIKI Development Database	AG	G	CICSK2	NS43
DB45	KEIKI Year-End RPT Database	AG	G		
DB46	KEIKI Test Database	AG	G	CICSK2	NS46
DB61	Production Database	DCCA, DHS, DOT	A	CICSV1P CICSV9P	XWN1
DB65	Test/Development Database	DLIR	B	CICSVCT	XWNA
DB67	Production Database	DLIR	A	CICSV5P	XWN7
DB69	Production Database	AG, DOTAX	A	CICSVBP CICSVFP	XWN9
DB99	Installation Database	ICSD	B		

#### 2.1.2 ADABAS Software Available At ICSD

ICSD licenses a number of products from Software AG and other vendors for use in the ADABAS environment. All but APAS and PLEU are under CPU license and may only be used on the CPU's specified on the



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following table.

PRODUCT	DESCRIPTION	HOST
ADABAS	Data Base Management System	A, B, F, G
ADAPREP	A data manipulation language	F (HAWI only)
APAS/INSIGHT	ADABAS performance monitor	A, B, F, G
SECURITRE	Security interface between the ADABAS/NATURAL & RACF	A, B, F, G
SYSAOS	Adabas Online System	A, B, F, G
PEEK	ADABAS file browser	G (KEIKI only)
PREDICT	Data Dictionary/Repository	A, B, F, G
PLEU	Audit trail tool	A, B, F, G

### 2.1.3 Use Of ADABAS Utilities

Unless SECURITRE is utilized, only ADACMP the compress-decompress utility, and ADAREP the database report utility will be available for use. **The ICSD-DBA staff is the only group authorized to execute all other ADABAS utilities.** In addition to the running of batch jobs users may use the ADABAS Online System (SYSAOS) to perform many of the same functions.

If SECURITRE is utilized, in addition to the utilities listed above the application computer programmers and systems analysts are permitted to run the following ADABAS utilities:

Utility	Description
ADADBS	Database Services
ADAINV	Descriptor Invert
ADALOD	Data File Loader
ADAORD	Reorder Database or File
ADASAV	Save / Restore Database or File
ADAULD	Unload File

Note: Not all utilities or function will be available for all databases.

Requests to the ICSD-DBA staff to run a utility can be made by a Departmental ADABAS Liaison via the DBMS Request System (see section 2.5.9 DBMS Request System). A maximum of three (3) working days should be allowed for the ICSD-DBA staff to complete a request.

The ICSD-DBA staff provides and maintains procedures (Procs) and sample JCL for the running of the utilities. For a description of a utility and



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all possible parameters see the ADABAS Utility Manual.

### 2.1.4 Backup And Restore of Databases

The ICSD-DBA staff backs up all ADABAS databases daily unless an alternate schedule as been agree to by the owner of the data.

Unless the data owner agrees to an alternate time, the backup is run each day between 3:00 a.m. through 6:00 a.m.

Eight generations of daily backups are retained and eight generations of the weekly backups.

Every day a copy of the most recent generation is taken for offsite storage for disaster recovery purposes.

A request to restore an ADABAS file from an ICSD backup should only be made if the file is irreparably damaged. The backups are not available for any other purpose, such as rerunning batch programs. Project teams are responsible for designing appropriate restart and rerun procedures for all batch jobs.

## 3 SYSTEMS DESIGN & DEVELOPMENT

### 3.1.1 Denormalization Process

The denormalization process should take place to improve the performance of programs when they access the database, and to reduce the cost of processing the information request. As a part of this process, the following limitations of the ADABAS database should be considered:

- Maximum compressed record length is Data Storage block size
- 191 periodic group occurrences per record
- 191 multiple values per record
- 4.2 billion records per file
- Maximum files per database is the lower of 5,000 or the Associator block size minus one
- 926 field/group names per file
- Maximum field length of 253 bytes





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### 3.1.2 Denormalization Considerations

The process of denormalization and finalizing the database file design should take into consideration the following design approaches and guidelines:

- a. Consider modification of the file design to combine two files into one, such as making one file a periodic group within another. This should be done when there is a high affinity factor between entities and a high access frequency.
- b. Consider the use of multiple record type files. This may be done when different types of entities are frequently accessed together by a common key and/or there is infrequent reason to read through an entire file for a given entity.

Table files and other files that are only accessed randomly, a few records at a time are appropriate multiple record type files. Table files are also ideal ADAM files.

- c. Consider the creation of additional descriptors, super-descriptors and sub-descriptors based on performance considerations (sorts, inquiries, etc).

Descriptors that are used together in searches or sorts should be combined together as superdescriptors. This will simplify searches and will also save Associator space.

If a descriptor is used in combination with other descriptors in selecting records, and provides very little refinement in the selection, then the field should not be defined as a descriptor at all. In this case, the records selected could be read to determine if they meet the total selection criteria. This will reduce the amount of space in the Associator and will also reduce the time for updates by eliminating an update to the Associator for the field.

- b. Do not store data elements that can be easily determined or derived.
- c. Determine the best storage method for data elements based on the primary usage. E.g., numeric data that is used mostly for retrieval on inquiries should be stored unpacked (format "U"). Numeric data that is used in computations should be stored in packed ("P" format).



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- d. Order data elements within files to insure optimum performance and ease of use. The following is a suggested approach to this ordering:
  - i. The best sequence ordering for fields within records based on format is:
    1. ADAM key
    2. all FI (fixed) fields
    3. all "normal" fields (not FI, MU, or NU)
    4. all NU and non-MU fields
    5. MU fields
    6. PE (periodic groups)
  - ii. Heavily used fields should be placed closer to the front of the record - this may override the sequence suggested above.
  - iii. Put NU fields most likely to be null adjacent to each other.
  - iv. All fields in PE groups should be NU (null suppressed) to allow individual occurrences to be completely deleted.
  - v. MU fields should be null suppressed unless relative positions need to be held.
  - vi. Avoid use of MU fields within periodic groups.

### 3.2 Recovery/Restart Design Methods

Individual transactions recovery within a system should be controlled via the use of ET (End Transaction) logic within programs. Design for the writing of ET data to allow for restarts of batch applications.

## 4 DATA SECURITY

Security and privacy of data elements, tables and files are essential for the reliability, integrity and accuracy of the information stored in the database. Refer to IT Standards 08.01 Security Overview and 08.02 Information Security for additional Data Security Standards.

### 4.1 Data Security Policy

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- a. SECURITRE file security and RACF will be used to protect all ADABAS files.
- b. NATURAL Security will be used to control access to applications, access to files, and NATURAL resource usage.
- c. The Protection Log Extract Utility (PLEU) will be used to provide audit trails of update activity on all sensitive data maintained on ADABAS files.

### 4.2 NATURAL Security System

Information and standards governing the use of the NATURAL Security System at ICSD are found in the IT Standards 11.11 NATURAL Standards and Conventions.

### 4.3 Protection Log Extract Utility (PLEU)

The audit trail job streams are submitted daily after the database backup jobs to process User specified extract statements. These jobs are used to extract information from the ADABAS Protection Log (PLOG) for the ADABAS files using PLEU. The job names are identified by having the following format: XWAX#, where "#" represents the Database Identification or DBID.

If the protection log extracted data is needed for a job, the project team must have documented operations control procedures to hold that job until after the job stream that processes XWAX# is completed successfully.

The protection log contains the "before" and "after" images in compressed format of all ADABAS records that were updated during the previous day's session.

An unlimited number of uniquely formatted requests to generate output-extracted files may be produced with only one pass through the protection log.

Each protection log extract output record will contain a header. The format is found in CA-PLEU User Guide under "CA-PLEU Output Files" on the CA web site listed above.

The EXTRACT statements are used to specify the record selection criteria for an individual ADABAS file with extracted output datasets. There must be at least one EXTRACT statement for each execution of the audit trail utility.

Each extract request can select records from the protection log based on its:



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- ADABAS file number
- Date
- Time
- Terminal-id
- User-id; and
- "before" and/or "after" images.

The User through parameters specifies the format of the selected records and the criteria used for the selection of the records.

The rules for the output format specifications are the same as those specified in the "ADABAS Command Reference Manual", on the Software AG web site listed above, with the exception of the following FORMAT specifications that are NOT supported:

- a. "Edit" formats.
- b. Repetitive form for specifying multiple value fields.
- c. Literals and "nx" specifications.
- d. Range specifications.

The syntax for the "FORMAT=" specification is:

```
FORMAT='FIELD<,FIELD, ... ,FIELD>.'
```

Where:

```
FIELD ::= NAME<,LENGTH><,FORMAT>
```

```
NAME ::= ADABAS-FIELD-NAME<I<-J<(K<-L)>>>>
```

```
LENGTH ::= COMPATIBLE FIELD LENGTH
```

```
FORMAT ::= /A/B/P/U/
```

Examples:

```
'AA,BB,CC.'
```

```
'AA,5,A,BB,3,MFC,3,U,MF1-6,6,U.'
```

```
'CB1-2(1-4).'
```



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'AA,12,U,CC1-6,6,VC1-20.'

### 4.3.1 PLEU User Responsibilities

The format of each extracted file is defined by the FORMAT specifications provided by the User as part of each "EXTRACT" statement.

### 4.3.2 PLEU Project Team Responsibilities

The project team must specify the ADABAS file number from which data will be extracted. This is the standard ADABAS file number between 1 and 5000. The format for this parameter is:

FILE=9999

The project team must also provide the FORMAT buffer definition of the format for which all records extracted will be written.

The application project team is responsible for coding the EXTRACT statements. The requests for extracts must be planned for during the design phase of the application system.

The application project team is responsible for identifying all the fields that they anticipate may be needed for audit trail verification.

## 5 PROGRAMMING

NATURAL is the most efficient programming language to be used for the access of data and information in ADABAS files. This ensures all access will be subject to NATURAL Security controls. Refer to IT Standard 11.01 Host Mainframe Program Planning and Design, and 08.02 Information Security for additional Data Security Standards.

### 5.1 Program Design And Performance

The cardinal rule for efficient application program design is: "**Minimize access to the ADABAS nucleus.**"

#### 5.1.1 Program Design Considerations

- a. Applications must be designed with a minimum number of calls to ADABAS. The direct CALL to ADABAS add significantly to the CPU



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usage and the physical I/O. On average for approximately 75% of the total CPU usage by an application is used by the ADABAS nucleus.

- b. Online (real-time interactive) programs are allowed to issue no more than 20 ADABAS calls per logical transaction as identified by the CICS assigned transaction number.
- c. Standards for the efficient design and coding of NATURAL programs are to be found in the NATURAL Standards manual. Additional standards and guidelines for both NATURAL and 3GL programming can be found in Unicenter CA-APAS Insight Monitor for Adabas User Guide under "Tuning Guidelines" on the CA web site listed above.

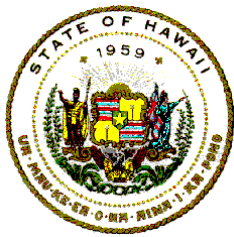
### 5.1.2 Program Performance Conventions

- a. The Multifetch option must be used with all batch programs other than those doing ADABAS file updates. The Adabas multifetch option significantly reduce the execution times of programs that process large amounts of data in sequential by reducing the number of system commands needed to complete Adabas calls.
- b. All sorts must be external sorts.
- c. The internal NATURAL "SORT" and "SORTED BY" statements should never be used.

## 5.2 Direct CALL Usage

The format for "call" subroutines from native mode batch programs should be: "CALL ADABAS", where the database will be determined by the JCL.

- a. For CICS, the link name should be "ADABAS".
- b. For greater efficiency, use the "COMMAND ID's" for the read and update commands.
- c. The COBOL/VS "DYNAM" option should be used to compile batch programs. This option will conserve library disk space, and will optimize link-edited modules.



## APPENDIX A: GLOSSARY OF TERMS

### DATABASE TERMS

#### Affinity Factor

The ratio of occurrences in which one logical entity is accessed together with another in daily activities. An affinity factor of '1' for entity-1 to entity-2 indicates that whenever entity-1 is used entity-2 is also used. Affinity factors are used during physical file design as an indicator of the potential benefit of denormalization.

#### Data element

A single item of data; therefore, one attribute of an entity.

#### Data redundancy

Redundancy occurs when the same data element is stored in multiple files. This practice can lead to inconsistencies in the value of a data element.

#### Denormalization

The process of modifying the normalized entity sets (files) to improve performance and to increase the usefulness of the files to current and future applications.

#### Entity

Any thing, an object, a person, or a relationship, about which information is required to run the business of an organization.

#### Entity attributes

The data elements which describe an entity.

#### Entity identifier

The entity attribute (key), or combination of entity attributes (concatenated key) which uniquely defines each occurrence.

#### Entity record

The set of attributes for a given entity.

#### Entity set

The set of all occurrences of entity records for a given entity.

#### Fragmented Map

A portion of the integrated map which is an individual userview of an application.

#### Integrated Map

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A chart of all files for an application showing all access paths between the files.

### Logical structuring

The process that involves evaluating the normalized entities. The individual entities have been defined at this point in terms of the primary key of each and the data elements that are a part of each entity set. The user views as defined for the applications are then "proven" against the entity sets, insuring that all required data elements can be accessed.

### Main Menu

An application design concept where the main functions of an application are displayed to a user, giving the user the option of selecting the particular function he/she desires to execute. This menu may normally be redisplayed to the user at any point in an application so that another function may be selected or the application may be terminated.

### Meta Data

This is data used to describe data, or it is the documentation of data elements, files, etc. For the database, this descriptive information is stored in a file called the data dictionary.

### Normalization

The process which takes an initial grouping of data elements (super entity) and breaks this group into multiple smaller groups of elements. All of the elements within each of the small groups are dependent on a single key.

### Primary access

This is the primary data access point to access the data elements in an entity set by using the entity identifier as the search argument.

### Program/Data

Independence is achieved by separating the descriptions of data elements from the program that accesses the data. This allows the data attributes and order of the data to be changed without affecting the program thus reducing program maintenance requirements.

### Relationship

The organizational association of structures that ties (or links) two data elements or two entities together. Relationships are determined by departmental policies and by data usage.

"One-to-one relationship" exists when each occurrence of the first entity is





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related to only one occurrence of the second entity.

“One-to-many relationship” exists when each occurrence of the first entity is related to one or more occurrences of the second entity.

“Many-to-many relationship” exists when each occurrence of the first entity is related to one or more occurrences of the second entity is related to one or more occurrences of the first entity.

“Simple relationship” is a one-to-one relationship.

“Complex relationship” is a one-to-many or a many-to-many relationship.

### Search argument

A value of an entity attribute used to make access to an entity set.

### Secondary access

The access point to enter an entity set, by using an attribute value other than the entity identifier as search argument.

### A Start-up program

The program that is normally required to establish global variables and to call the main menu program for an application. It is normally executed automatically when a user logs on to a production application.

### Super entity

The initial grouping of all data elements for a database system once they have been determined. The normalization process is used to break this entity into multiple entities.

### Third-Normal-Form

The final grouping of data elements once the normalization process has been completed. In this form, every element within an entity set is directly related to the same key.

### User View

A selected number of fields from a database file that are grouped together under a separate name but access the same file. The purpose of separation may be to secure data (by omitting a field, access is disallowed) or to create a logical subgroup of data elements within a file.

## ADABAS TERMS

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### ADABAS field name

A two (2) character alphanumeric code-name used internally within ADABAS.

### ADABAS session

The processing time that ADABAS is active within a partition space.

### ADAM

An acronym for ADABAS Direct Access Method. It permits records to be retrieved directly from data storage without access to the inverted lists.

### Address converter

The relative address that is used to identify the physical block in which a given logical record is contained in data storage.

### APAS

A software product used as a performance monitor by ICSD for ADABAS. It provides both batch performance reports and online monitoring. The online monitor is called "Insight".

### Associator

A tool that contains internal control information for the entire database. It also contains control information for each file in the database such as space allocations, address converter, inverted lists, and field definitions.

### Autobackout

The routine that is executed automatically at the beginning of each ADABAS session that removes all updates performed within non-successfully completed transactions issued by ET logic users.

### Buffer flush

The physical writing to the database of all blocks marked for update in the ADABAS buffer.

### Data storage

The direct access storage area that contains the compressed data records for all ADABAS files.

### Descriptor

The ADABAS term for a record-key.

### ET logic user



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Any one who employs ET (and possibly BT) commands. Usage of ET commands guarantees physical update to the database of all updates performed within a user logical transactions, thus permitting the user to achieve a restart capability at the transaction level.

### Exclusive file control

Exclusive control is used to prevent other users from updating the file during the user session.

### FI field

This is a "fixed length" field, which describes the manner in which the field will be stored within the database. FI represents fixed which means that even if the field contains blanks, it will be stored as is (not compressed). This option is recommended for 1 or 2 byte fields which most likely will not be blank.

### Field

This is the smallest logical unit of information which may be referenced by the user.

### File

A grouping that consists of a collection of logically related records.

### Inverted list

A list of the different values of a descriptor, together with the count and the ISNs of the records which contain each value.

### ISN

The internal sequence number which is assigned to each logical record within a file. The ISN is used as the logical identifies of the record.

### MU field

A multiple-occurring field which may have up to 191 occurrences.

### Multi-user mode

A mode that consists of executing a user program in a separate partition space from that used for ADABAS. This mode of operation permits two or more users to access the same database at the same time.

### NATURAL

A fourth-generation programming language sold by Software Ag. It is primarily for development of ADABAS systems but may be used for with sequential files.

### NATURAL security object

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An identified element for which the Natural Security System (NSS) defines security characteristics. These include Users, Applications, Files, and Mailboxes.

### NATURAL primary field name

The ID (identifier name) of the field, which is the standard name associated with a data element defined within the data dictionary. Each data element must have a standard name and a user friendly synonym.

### NU field

A storage type definition for an ADABAS field which permits compression of the data.

### Physical structure

The file design which results after the logical and physical design processes have been completed. Essentially considerations for performance, data independence, and accessibility of information are applied to the logical design to arrive at the physical design.

### PREDICT

The data dictionary software product of Software AG. With this product, the user may store information about data elements, file systems, programs, reports, and many other objects.

### Single-user mode

The mode that consists of executing a user program together with ADABAS in a single partition space. A user operating in single-user mode has exclusive use of the entire database.

### Subdescriptor

A descriptor name whose data is derived from a portion of an elementary field.

### Superdescriptor

A descriptor name whose data is derived from a combination of several fields or portions of fields.

### User session

A session is deemed to begin with the first ADABAS command issued by the user and ends with the last ADABAS command issued by the user.



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APPENDIX B: FORMAT FOR REPORTS OF PROJECTIONS
OF BATCH JOB ACTIVITY & PROJECTIONS OF ONLINE ACTIVITY

PROJECTION OF DAILY ONLINE ACTIVITY

APPLICATION NAME: -----

COLS-A VERTICAL COUNTS OF TRANSACTIONS PER SCREEN

COLS-B AVERAGE TRANSACTION VOLUME

COLS-C MAXIMUM TRANSACTION VOLUME

COLS-D AVERAGE NUMBER OF ADABAS CALLS PER TRANSACTION

COLS-E MAXIMUM NUMBER OF ADABAS CALLS PER TRANSACTION

COLS-F ANNUAL PERCENTAGE TRANSACTION VOLUME INCREASE

COLS-G MULTIPLY COLS-B TIMES COLS-D

COLS-H MULTIPLY COLS-C TIMES COLS-E

Example:

PROJECTION OF DAILY ONLINE ACTIVITY

APPLICATION NAME: -----

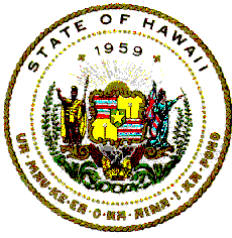
(COLS-A) (COLS-B) (COLS-C) (COLS-D) (COLS-E) (COLS-F) (COLS-G) (COLS-H)

AVE. TRANS. VOL. (ATV) MAX. TRANS. VOL. (MTV) AVE. NUMB. ADABAS CALLS/ TRANS. (ANACT) MAX. NUMB. ADABAS CALLS/ TRANS. (MNACT) ANNUAL PERCENT TRANS. VOL. INCREASE Multiply ATV TIMES ANACT Multiply MTV TIMES MNACT

COUNT OF TRANS/ SCREEN1

COUNT OF TRANS/ SCREEN2

COUNT OF



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TRANS/ SCREEN3	.....	.....	.....	.....	.....	.....	.....
COUNT OF TRANS/ SCREEN4	.....	.....	.....	.....	.....	.....	.....
	<u>(TOTAL)</u>	<u>(TOTAL)</u>			<u>(TOTAL)</u>	<u>(TOTAL)</u>	

PROJECTION OF BATCH JOB ACTIVITY

APPLICATION NAME: -----

COLS-A Vertical Counts by "JOB-NAME", program-1, program-2, program-3, etc.

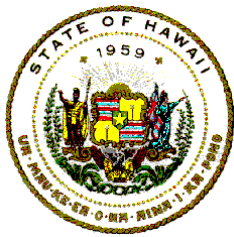
- COLS-B FREQUENCY ("D" Daily; "W" Weekly; "M" Monthly; "Q" Quarterly; "A" Annually)
- COLS-C AVERAGE NUMBER ADABAS CALLS
- COLS-D MAXIMUM NUMBER ADABAS CALLS
- COLS-E ANNUAL PERCENT INCREASE
- COLS-F NUMBER OF COMPLEX COMMANDS
- COLS-G NUMBER OF UPDATE COMMANDS

Example:

PROJECTION OF BATCH JOB ACTIVITY

APPLICATION NAME: -----

(COLS-A)	(COLS-B)	(COLS-C)	(COLS-D)	(COLS-E)	(COLS-F)	(COLS-G)
	FREQ.	AVE. ADABAS CALLS	MAX. ADABAS CALLS	ANNUAL PERCENT INCREASE	NUMBER COMPLEX Commands	NUMBER UPDATE Commands
JOB: job-name	..D..	.....	.....	.....	.....	.....
program1-name	..D..	.....	.....	.....	.....	.....



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program2-name	..W..	.....	.....	.....	.....	.....
program3-name	..W..	.....	.....	.....	.....	.....
program4-name	..M..	.....	.....	.....	.....	.....
program5-name	..M..	.....	.....	.....	.....	.....
program6-name	..Q..	.....	.....	.....	.....	.....
program7-name	..A..	.....	.....	.....	.....	.....
JOB TOTALS		.....	.....	.....	.....	.....



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### APPENDIX C: SYSTEM PROCEDURES

#### ADAMER

The procedure "ADAMER" is used to estimate the average number of accesses that should be required for an ADABAS Direct Access Method (ADAM) file of various sizes by using the ADAM Estimator utility (ADAMER). The control cards are added to this procedure by appending a "SYSIN" statement after the procedure statement.

There are three symbolic parameters for this procedure: "DEPT," "DBID," and "FILENO" to respectively specify the:

1. Department PMS code.
2. Database identification number.
3. File number (zero filled).

#### ADACMP

The procedure "ADACMP" is used to compress a sequential dataset that will be used as input to the ADABAS Loader utility. This is the "ADACMP" utility that uses the program: "ADARUN".

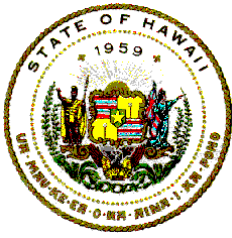
There are three symbolic names in this procedure: "DEPT," "DBID," and "FILENO" to respectively specify the:

1. Department PMS code.
2. Database identification number.
3. File number (three digits, zero filled).

There are three additional areas of concern before the job is submitted:

1. The DD statement "DDEBAND" must be overridden to identify a permanent dataset when a temporary dataset named &&DATA is not used.
2. The DD statement must not be "DUMMY", but may be an empty dataset.
3. The DD statement "DDKARTE" is expecting file definition cards either instream in a "SYSIN" dataset, or in a user defined sequential dataset.





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