



Prime INFORMATION™ (Rev. 6.0)

Main Features

Powerful fourth-generation data management facilities

- Non-procedural command and inquiry language
- Fully customizable, user-specific vocabulary

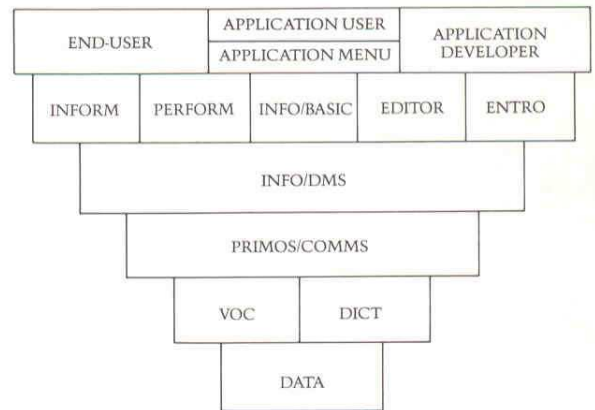
Relationally-based, distributed DBMS

- Integrated data dictionaries
- Fast hashed key access to all files
- Flexible and adaptable
- Compact, variable-length technology
- Multi-valued fields and associations
- I-type descriptors provide related, concatenated, computed, conditional and programmed virtual fields
- Transparent inquiry and update on remote data files
- Full concurrency control across network

Full application development environment

- Fast prototyping tools
- Structured, easily-learned programming language
- Fast compilation and interactive source-level debugging
- Built-in editor with command stack
- Integrated, multilevel menu subsystem
- Access to PRIMOS® operating system-based facilities and applications
- Record retrieval and update access to MIDASPLUS™ files

Compatible with all 50 Series™ systems running on the PRIMOS® operating system



Prime INFORMATION Architecture

Main Description

Prime INFORMATION software is a powerful, fourth-generation, relationally-based, distributed database management product. It provides a unique, complete and highly productive environment for creating and using integrated application software solutions.

The system is so comprehensive that it enables applications to be developed literally from start to finish. The many operations that can be performed with the Prime INFORMATION system include:

- quick, easy application prototyping
- file and database design
- writing production programs
- multi-level menu creation and maintenance
- performing pre-defined or ad hoc queries and reports
- changing data definitions easily without reloading the database
- entering and verifying data easily
- completely customizing an application and user environment.

This product will run on all 50 Series superminicomputers.

Fourth-generation system

Prime INFORMATION is considered a fourth-generation product because it creates and maintains a highly productive, user-friendly, flexible and easy-to-customize environment for both the user and the developer.

Developers using Prime INFORMATION are usually four-to-ten-times more productive than those using traditional development systems, because of the interactive tools provided to model, prototype, write, compile and debug entire applications. The system provides extensive online HELP facilities. The user can customize a vocabulary containing all of the words, verbs, phrases, keywords, sentences and paragraphs that Prime INFORMATION software understands. Users can expand or update their own vocabulary files and default records at any time. Noisewords (throw-away words) can be added to those that come with the system, making commands given to Prime INFORMATION more natural and readable.

Relational-like

The system is a very flexible, relational-like environment for the user. Prime INFORMATION keeps data separate from the dictionaries, so users can modify, add or delete definitions quickly and easily. Users can perform these operations without having to unload and reload databases, recompile programs and redesign reports and inquiries.

Prime INFORMATION goes beyond these relational advantages. By storing data in a variable length format on disks, it improves storage efficiency and simplifies changing information. There may be one dictionary to describe several data files, or several dictionaries for a single file. Multi-valued fields, such as children's names in a personnel database, can occur as often as desired within a record. Groups of multi-valued fields forming an Association (similar to a COBOL repeating group) also have no preset limit on the number of times they can occur.

I-Items (I-type Descriptors)

Another unique feature of the system is the I-item, which is described in the dictionary. I-items describe fields that are not stored as individual data fields. Instead, these fields are either calculated from other data field values or I-item field values, or are taken from related data fields in other files during execution.

Examples of I-items include arithmetic calculations, concatenations, conditionally-processed fields, and fields whose values are determined by a system-supplied intrinsic function, or by a user-written subroutine.

Distributed Applications

Prime INFORMATION offers truly distributed processing capabilities because it allows users to transparently access and update data on remote systems in an ad hoc or programmed manner, as though the data was stored locally.

This is very useful in departmental systems connected to and sharing data with a main corporate system, or in applications where widely dispersed systems need online access to both a local and remote database. Prime INFORMATION also takes full advantage of the excellent communications facilities of Prime® systems.

Prototyping and Application Development

Prime INFORMATION can save users significant amounts of time and money by enabling them to prototype an entire application without writing a single line of code. This prototype forms the basis for the production solution; in some cases, it may be the solution.

If additional programming is required, the system has such excellent development tools as the Prime INFORMATION editor and the INFO/BASIC™ compiler and debugger.

Prime INFORMATION software also provides a complete menu sub-system for defining and restricting access to applications. Programs do not have to be specially written for this purpose. Dictionary views of data used in conjunction with Access Control Lists and other PRIMOS security features can create a fully secured application usage environment.

For integration purposes and greater ease-of-use, Prime INFORMATION provides convenient access to its host operating system, PRIMOS, and to the many PRIMOS based applications and databases. Verbs in the vocabulary file will execute PRIMOS commands for the interactive user. For call level access to subroutines written in non INFO/BASIC languages such as COBOL, Fortran, and PL/1 from INFO/BASIC programs, Prime INFORMATION offers the General Calling Interface (GCI). Also, a set of INFO/BASIC subroutine interludes are provided for read/write access to records maintained by MIDASPLUS (Prime's multiple-indexed file access system).

Technical Description

The system consists of several sophisticated, fully-integrated subsystems: INFO/DMS, INFORM,TM PERFORM,TM INFO/BASIC, EDITOR and ENTRO.TM Its state-of-the-art technology provides data independence through its dictionaries, and user-friendliness through its vocabulary and built-in HELP files. Each subsystem is both vocabulary- and dictionary-driven.

PERSONAL VOCABULARY (VOC) FILE

Every Prime INFORMATION system user or account has a personal vocabulary (VOC) file, which is the language or lexicon of Prime INFORMATION. It contains all the verb, keyword, phrase, sentence, paragraph, procedure and file definitions. A user can modify, delete or add records to the VOC file, customizing the ACCOUNT for personal use or running applications from that ACCOUNT.

INFO/DMS

The Data Management System of Prime INFORMATION lets user store, retrieve and update information without limiting the size or number of files created. Data files are maintained in online local or remote disks. Their companion dictionary files contain the name of the data field, the display format and internal storage formats, conversion functions, input audit checks, and the relationships of these items with other fields, records or files. All report generators, update processors and application programs can access important information on definitions and structures.

Prime INFORMATION files can contain any number of records. The system software dynamically assigns space for new records in a file, and dynamically returns space when records are deleted. An application system will not abort from a user who has not reserved file space in advance. Records are located by applying one of several hashing algorithms to the key of the record.

Completely variable in size, Prime INFORMATION records can contain any number of variable-length fields, each of which can contain any number of variable-length values. The size and number of fields can change as an application changes, without physically restructuring the files. This lets users develop applications without knowing the maximum field size and without reserving storage space. In addition, the INFO/BASIC programming language has functions designed specifically to handle variable length fields and records efficiently.

Files are organized both relationally and hierarchically. A file can be assigned security codes and various levels of update and access rights. Internally, INFO/DMS maintains data in a very efficient format. Using Association values and subvalues can eliminate cross-references and data duplication, and minimize multiple disk access to retrieve or recall a specific data element. Up to four times as much data can be stored in the same disk space as in most fixed file systems.

These features combine to make designing and implementing a database management system in Prime INFORMATION very simple. All programs can share file definitions and data. Programs tend to be small, and both easily written and maintained.

INFORM

This non-procedural language query and report generator manages information easily through local or remote online terminals. It gives casual users hands-on access to valuable business records, almost as easily as if they were using a desk calculator.

The vocabulary of INFORM software contains verbs, file names and optional sort criteria, selection criteria and output specifications. Starting with a very simple request, INFORM lets users build and analyze varying levels of data. Earlier requests can be recalled, altered and saved by employing a user-specific name.

Example: (Fig. 1)
:SORT THE PERSONNEL.DATA FILE BY
AGE BY LAST.NAME BY FIRST.NAME WITH
EMPLOY.DATE AFTER 1-1-85 PRINT NAME
ADDRESS BREAK.ON "P" AGE SALARY
DEPARTMENT LPTR

This example will produce a printed report of personnel hired after January 1, 1985. The report will be, in order, by age and name, listing address, salary and department. A new page begins with each new age. "LPTR" directs the output to the printer instead of the terminal. Note the use of the throwaway words THE, FILE and PRINT to improve readability.

PERFORM

PERFORM software is a multiple-user command and control facility based on the PRIMOS operating system, together with a customized user interface.

This subsystem is communicated with through the commands it receives; the vocabulary file is used to transform the commands into sentences. The sentences then invoke various processes within Prime INFORMATION.

PERFORM software operates on verbs, stored sentences, menus and paragraphs. Operations are dictated by the type of the word, as defined in the vocabulary file for the first word in the command. PERFORM integrates interactive, batch and real-time supervisory services in a single, "embedded" operating system. It supports the 32 megabyte virtual address space available in all Prime processors. The embedded design increases system speed and makes Prime INFORMATION extremely responsive.

A unique feature of PERFORM is the sentence stack Editor. It allows the last 99 PERFORM commands to be edited, combined and stored in the VOC file as sentences or paragraphs. They may also be executed.

INFO/BASIC

This structured procedural language is easy to learn because of its simple syntax and built-in functions. It incorporates many of the best commercial features of COBOL, Pascal, PL/I and BASIC. INFO/BASIC functions include building variable length dynamic arrays; modifying arrays and extracting variable length fields, values and subvalues; simple read/write/print statements that operate on totally variable record sizes; and substring extractions based on a specified delimiter.

INFO/BASIC also supports direct access record location for such online systems as data entry, updating and retrieval, and sequential access techniques for batch-type programs like payroll register and general ledger reports. Such flexibility means that only one language is needed for all data processing systems.

INFO/BASIC is a general purpose programming language designed for programming inventory control, accounts payable and receivable, and similar business tasks. Novice programmers can be effective with very little training, while advanced programmers have the resources to solve complex problems quickly and accurately. An interactive source level debugger is provided for faster program development and testing.

Programs developed online and added to the user's vocabulary can be maintained privately, or shared with other users through public libraries. These programs can be dynamically linked to other programs and subroutines, and can refer to common data variables. Programs can also be grouped into application packages to form modular, easily configured software systems.

The INFO/BASIC compiler is designed to produce code that runs in a multiple-user, virtual memory environment. Object code is exceptionally compact. Execution speeds and system loading are balanced to give the largest number of users the fastest response time possible.

EDITOR

The Prime INFORMATION editor is an easy-to-use tool for system development and maintenance. It operates on one record at a time, and is used to build and modify data, programs, dictionary entries and vocabulary entries. It features its own command stack, an "OOPS" error facility and full access to the PERFORM and INFORM components.

ENTRO

This is a structured update facility that can modify database records. ENTRO can process any system file, plus edit and verify input data according to user-defined criteria. The ability to define an update process in one ENTRO sentence can eliminate much of the high cost involved in developing system update programs.

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Prime Computer, Inc.
Prime Park
Natick, Massachusetts 01760