INQUIRE®
SYSTEM OVERVIEW

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ABSTRACT

INQUIRE is a versatile database management system with integrated information retrieval and full-text processing capabilities. Designed primarily for the end-user of information, INQUIRE features rapid start-up of applications and has a broad range of facilities for both technical and non-technical users.

INQUIRE is operational on IBM System 360 or 370, Amdahl 470, or equivalent, under OS, VS, MVS, or CMS.

INQUIRE DATABASES

An INQUIRE database is made up of logical records representing people or things that are grouped together for some reason. The database also maintains all keys used to characterize or classify the data. The set of logical records and their keys is called an INQUIRE logical database.

Logical records are made up of fields. Fields may be fixed in length, or vary from record to record. Fields may be segmented and redefined at will. Numeric fields may be integer, packed or binary. Fields may be single-valued or repeating, with either a fixed or variable number of occurrences. Translations or coded fields are stored in a decode file which may be shared among databases in order to minimize disk space.

An INQUIRE logical database may stand alone or be dynamically related to up to 31 other logical databases, without hard-wired pointers or utilities. Through this powerful multi-database feature, hierarchies, networks, or relational data structures are accommodated.

SYSTEM COMPONENTS

The integrated INQUIRE system incorporates the following components:

Core System

The Core System consists of the User Language, Loader System and Core Utilities.

The INQUIRE User Language performs retrieval, report generation, and database maintenance using easy-to-learn English-like commands. Commands are identical in either on-line or batch modes. Knowledge of just a few basic commands allows complete querying and reporting.

Features of the User Language include:

- Multi-key selection criteria with Boolean logical operations
- Field value selection criteria such as range tests, arithmetic and character comparisons
- Keyed and non-keyed selection criteria in the same query
- Keyword root searching
- Both direct access (FIND) and/or sequential (SCAN) searching
- Computation using fields (single-valued or repeating and constants
- Sorting on multiple control fields (ascending and descending)
- Control breaks (summarization and subtotaling) to any level
- Report formatting - fixed or variable page headings, explicit or default column title generation, numeric editing, text insertion, table lookup, etc.
- Maintenance (add or delete records, replace fields, enter/remove/rename keys)
- Cross tabulations
- Histograms
- Macro facility for storing commands, branching and conditional logic, and custom interactive dialogues.

The Loader System creates new databases or performs bulk additions to existing databases. It is an efficient batch system which creates or updates all files internal to an INQUIRE database. The loader system directly loads many input files and provides a standard input format for files which cannot be directly loaded. (See also INQUIRE Generalized Preprocessor.)

Core utilities perform tasks such as printing of keyword lists, transfer of databases from one device type to another, unloading of databases, and recovery of space from deleted records.

Data Management Supervisor

This component regulates simultaneous on-line and batch operations of both User Language and multiple host language application programs with teleprocessing monitors such as CICS or INTERCOMM. The Data Management Supervisor schedules, dispatches, and multi-threads tasks; manages buffers; protects against simultaneous updates of a single record by multiple tasks; includes master terminal functions; maintains output page queues; and provides paging services independent of the teleprocessing monitor used.

The Data Management Supervisor also logs before and after images of changes fields and keys, and provides automatic backout of transactions in progress when a system crash occurs. A log utility program, image dump/restore utility, and forward apply utility are provided with the Data Management Supervisor to insure integrity of databases.

Operating in its own region and communicating with the teleprocessing monitor via an interregion SVC, the Data Management Supervisor is isolated from failures of the teleprocessing monitor, and the TP monitor is protected from a failure in the Data Management Supervisor (due to hardware or software).

Security and Accounting

Database administrators may impose privacy controls on INQUIRE databases and operations. Users can be forced to supply passwords and/ or other user identification such as account numbers. This identifying information establishes access down to the command, database, and field level. Each field may be assigned one of eight read protection classes and one of eight update protection classes. Accounting information includes CPU and elapsed times, I/O counts, error return codes, and other system resource measurements. Accounting information is tagged with account numbers and written to an accounting file. The file itself may be loaded as an INQUIRE database for analysis and report generation.

Multi-Database Processor

With this component, users can search up to 32 databases simultaneously in one query, extracting fields from each database as necessary to generate reports. Connection of databases is by keys and requires neither hard-wired pointers nor the running of special utility programs. Connection is done by the user, dynamically, in the User Language. The Multi-Database feature also supports iterative searching, whereby a user can create temporary subsets of a large database, and search the subsets, narrowing or broadening the scope of the search until the desired information is found.

Procedural Language Interface

Application programs written in COBOL, PL/1, FORTRAN, and Assembler Language access or update INQUIRE databases through the Procedural Language Interface (PLI). Standard CALL mechanisms pass control blocks from the application program to the PLI. Control blocks define the environment (job, terminal, application, enqueue options), database processing (read only or update, record or database level enqueue), and fields to be accessed or changed. CALLS are available to read, read for update, get field, put field, rewrite record, add new record, etc. Fields are requested by name, making programs independent of database structure or changes affecting other fields. The PLI is an effective tool for high-volume transaction processing, both on-line via the Data Management Supervisor, or in batch.

Statpack

This facility extends the User Language computational functions. Operating with matrices or cross tabulations, the statistical package computes mean, standard deviation, standard error, column percentage, minimum, maximum, and division of one table by another.

Terminal Interface

Interfaces are provided for TSO, CICS, INTERCOMM, and IMS/DC, and
a CMS version of the INQUIRE User Language. The TSO interface sup-
ports routing of query output to a report file, and also permits the
execution of TSO commands from within INQUIRE. The CICS or INTER-
COMM interfaces, operating in conjunction with the Data Management
Supervisor, provide 3270 (or equivalent) screen paging facilities.
Users may browse forward or backward; or to the beginning, end, or
last query output. Mnemonic codes or function keys (as available)
may be used for paging commands. Hard-copy terminal support is
also provided.

Generalized Preprocessor

INQUIRE can load many files directly to an INQUIRE database. Some
files require conversion, or preprocessing. The Generalized Pre-
processor accommodates most input files which cannot be directly
loaded, and converts them to INQUIRE standard input format. It
handles input files organized with either one or multiple physical
records per logical INQUIRE record; or where input fields are in
fixed positions or variable positions depending on a record type in-
dicator. Exits are available for user processing during the con-
version process. The Generalized Preprocessor will also perform
translations or table-lookup.

EDICT - (Data Element Dictionary/Directory Processor)

EDICT provides a centralized inventory of data elements - their at-
tributes, usage, definitions, etc. - across multiple INQUIRE data-
bases or non-INQUIRE files. EDICT creates and maintains a data ele-
ment master file; generates standard reports such as a cross-refer-
ence of INQUIRE field names to English data element names; and pro-
duces INQUIRE Field Definition Tables ready for creation of INQUIRE
databases. Ad hoc queries or reporting on data elements can be
performed using INQUIRE's standard capabilities.

Text Processing

A collection of capabilities for handling unstructured free text
databases, or textual elements in structured databases. Includes:

- Proximity Searching - rapid inverted searching of words in text.
  Users can specify word distance conditions such as adjacency, or
  words within ± n words/sentences.
- Automatic Indexing - assignment of words, word pairs, or phrases
  as index terms or keys to textual data.
- KWIC/KWOC - production of keyword-in-context or keyword-out-of-
  context displays.
- Thesaurus Control - matching of index terms against an AVOCON
  thesaurus for indexing control. AVOCON is another Infodata
  product designed for the creation, maintenance, and display of
  thesauri.