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The ENQUIRE System
Short Description

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For the description of modular systems.

Iss 1.1

(text formatting by REPORT program)

Contents

1. Introduction

ENQUIRE is a method of documenting a system. It concentrates on the way the system is composed of parts, and how these parts are interrelated.

This information about a system is difficult to store, and particularly to update, using paper documents, so ENQUIRE stores its information on a computer. The ENQUIRE-WITHIN program allows a person to create and edit the data, so that others can later extract it as it is relevant to them.

2. Scope

The ENQUIRE system is designed to fill a gap in many current documentation systems. A person finding himself faced with a piece "xxx" of a system should be able to ask ENQUIRE, for example

What is xxx part of?

What is xxx composed of?

What must I alter if I change xxx?

What facilities does xxx use?

Where do I find out more about xxx?

Who or what produced xxx?

ENQUIRE does not aim to answer such questions as

How does xxx work?

What format is xxx in, exactly?

Why was xxx created?

What is the format of the interface between xxx and yyy?

The answers to these questions are normally covered by the descriptions and specifications of xxx. ENQUIRE may be of use in helping a user to find such documents, but it does not reckon to store them.

3. Modular Structure in General: Circles and Arrows

The assumption is made that the system to be described can be broken up into "modules". It is generally accepted that this is a necessity for any modifyable or maintainable system involving computers. No assumptions are made about how the breaking up is done — ENQUIRE imposes no constraints on the high level design.

A similar way of describing a structure is to draw, on a piece of paper, circles with arrows in between. The circles ("modules") could be programs or pieces of hardware, for instance, and the arrows could mean "passes data to", "is composed of", or "is started by". This method, with a variety of different shaped boxes, and different coloured arrows, is useful, clear, and commonly used. The ENQUIRE system allows a more complicated system to be described than would fit on a piece of paper. It then allows an interactive user to explore the system in search of the information he requires, seeing only the parts which are of interest.

ENQUIRE divides both the modules (circles) and relationships (arrows) into broad categories. This makes it easier to analyse the structure you end up with. For instance the relationships "is part of" and "includes" show the division of a module into smaller modules. Also, when altering one part of the system, it is useful to know by which other parts it is used. These are generalised reletionships, just as Document, Program, Machine are generalised types of module.

The modules may be all sorts of things. They are referred to below as "nodes", because of the role they take in the network of interrelationships within the system.

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4. Objectives

4.1. Documentation

The primary objective of ENQUIRE is to store and retreive information about the structure of a system. This is done with the aid of the interactive ENQUIRE-WITHIN program. As a side-effect to this, those people defining the structure of a system using ENQUIRE may find themselves thinking about it, and with luck a proliferation of interdependancies may be avoided.

4.2. Analysis

As a second stage, the data produced may be interesting to investigate. This may show

(a) whether the eventual structure of the system matches its design goals;

(b) when changes are required, what sort of changes would make the system cleaner and more manageable, rather than less so.

Whether this form of analysis is useful is yet to be determined.

4.3. Control

When a system is expanding rapidly, some control is normally required over the way it is allowed to expand. If rules are made, it may be that ENQUIRE provides a way of checking that these rules are adhered to, and that aspects of the structure have not been introduced which will degrade the system in the long term. (The topic of project control for complex systems is a large one, and is not discussed here).

4.4. Reminder

It must be emphasised that the ENQUIRE system is not intended to replace other forms of documentation, and is designed to work alongside other indexing systems and retrieval systems.

5. Using ENQUIRE-WITHIN

The following is an outline of the facilities available from the interactive editor. Note that the program assumes a VDU with a speed of at least 1200 baud which accepts the backspace character.

5.1. Implementation under SINTRAN III

The ENQUIRE program is currently stored on file (GUEST)ENQUIRE-WITHIN:PROG on the PRDEV computer on the CERN PS control system. Log in to any of the interactive VDU terminals. At SINTRAN III command level, type

```
@(GUEST)ENQUIRE <params>
```

and the system should respond

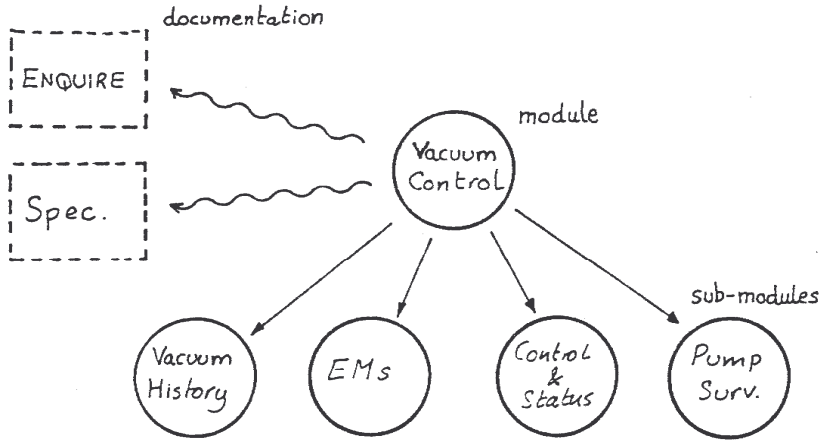
```
Enquire V x.x
Hello!
```

The only <param> which is acceptable at present (Oct 80) is the keyword EDIT. If this is present, you will be allowed to alter those files to which you have write access under the operating system.

The database is stored on various "continuous" files called xxxxxxxxxxx-V1:ENQR. The 12 characters xxxxxxxxxxx include the user name under which the file is stored, and part of the filename. Seperate files are used for storing information about different parts of systems, but an object in one file may freely refer to objects in other files.

```
@ENQUIRE
Enquire V 1.1

Hello!
Opening file (PSK-PCP)VAC-V1:ENQR...

PSB Vacuum Control System                          (concept)  <   0>
--- ------ ------- ------

 [ 1] described-by: Enquiry System
      An experimental system for which this is a test.

 [ 2] includes: Vacuum History System
      Records and displays slow changes in pressure.

 [ 3] includes: Vacuum Equipment modules
      Perform all the hardware interface

 [ 4] includes: Control and status applications programs
      Provide operator interaction from the consoles.

 [ 5] described-by: Controle du System a Vide du Booster 11-2-80
      Operational specification of the software

 [ 6] includes: PSB Pump Surveillance System          PCP 228
      Allows rapid monitoring of pressure changes

[number      ]
```

Fig.1 (above) The PSB Vacuum Control node in the file (PSK-PCP)VAC-V1:ENQR. The [prompt] is shown on the last line.
Fig.2 (below) shows a "circle and arrow" representation of the same information.



5.2. Display format

On entry into ENQUIRE, and at various points during its use, the user is presented with a page much like fig 1. This gives information about one of the "nodes", and the relationship between it and other nodes. The corresponding circle and arrow diagram is shown in fig.2.

Information displayed is as follows:

For each node,

1. Name: Name of the node, filename if it represents a file
2. Sort: Category into which the thing described is placed
3. Comment Any further text considered relevant by the last editor.

For each related node,

1. Number: Allows one of the nodes refered to to be selected.
2. Name: The name of the related node.
3. Relationship: Generalised relationship between the two nodes.
4. Comment: A description of the node refered to. This text describes the way it is relevant to the node being listed.

The following "sorts" of node are currently (Oct80) chosen from the following set:

hardware	-	a piece of equipment
text-file	-	readable ASCII information stored on computer.
report-file	-	text information accessable by computer, best read after being processed by the REPORT program.
code-file	-	information stored on computer, not human-readable.
paper-docum.	-	a human readable document not stored on computer.
concept	-	an abstract idea, anything without a physical form.
person	-	those strange unreliable beings on which all systems eventually depend.

The type of relationship is currently one of the following set:

uses used-by	}	Complementary. Reflect that one node relies on the existence of the other.
includes part-of	}	Complementary. One module is a sub-module to the other.
made made-by	}	Complementary. One module, program or person, was responsible for the other.
describes	}	Complementary. Useful for linking documentaion

described-by }	to that to which it is relevant.
background } detail }	Link different documents together
similar-to } other }	If none of the specific relationships above hold, one of these is chosen.

5.3. Commands

On entry, the user is in the outer command level of ENQUIRE. He is prompted by two brackets, and may insert a command word between them. The following commands are available at this level to allow interrogation of the data. Commands marked * also allow alteration of the data.

1,2,3 etc.	Select one of the nodes refered to by this one. Move on to that node, and display its relevant data.
Retrace	Return to a previous node. The user is prompted with a list of nodes previously encountered. He selects one of them, by number.
Mark	"Remember this node". The user marks nodes which interest him. A list of up to 16 such marked nodes is maintained. This list is displayed after each "mark" command.
Unmark	The last node marked as interesting is removed from the list.
List	List all the references and comment about this node.
Quit	Leave the ENQUIRE program.
Create *	Make a new enquiry data file. The file must already exist under SINTRAN III as a continuous file of suitable size.
Extend *	Add another node to this file.
Edit *	Go into EDIT MODE, to alter information about this mode.
French	Load new vocabulary (See Section 5.6)

Note: The commands marked * are only available if the user has write access to the file, and gave the EDIT parameter when originally invoking the ENQUIRE program. (See Sect 5.1)

5.4. Edit Mode

Edit Mode allows the user to alter the details about the current node. He is prompted for an edit mode sub-command by a different, distinctive prompt:

```
                >> edit object [          ]
      or        >> edit reference [          ] , etc.
```

The prompt shows what part of the data he is dealing with. The set of actions possible in EDIT mode differ from those possible at the outer command level (Section 5.3). Some of these have the same keywords as those at the outer command level, but should not be confused with them.

create Create a new reference, from this node to one of the ones marked as interesting. The user is prompted with a list of such nodes, and selects one. He then supplies a few details about the node selected, from the particular point of view of the node he is editing.

list List the bit of data I am currently dealing with.

edit Edit the bit of data I am currently dealing with.

extend Add a new bit of comment immediately after this bit of data. If there is already some comment tagged on, more may only be added to the end of the last line.

The following sub-commands affect which bit of data is to be dealt with next:

object Deal with the name of the node and its sort.

reference Deal with the next reference.

comment Deal with the next line of comment.

quit Leave edit mode, return to the outer command level of ENQUIRE.

5.5. User Input

After giving a command or sub-command, the user may be prompted for further input. The prompts should be self-explanatory. When entering any information, the following control characters may be used.

Control/D means "accept the line as it is currently displayed"

Return means "accept the line to the left of the cursor", unless the cursor is under the first character of the

line, in which case the meaning is the same as for Control/D.

Answering Return to a question immediately, therefore, will give the default answer if one exists. Also,

Backspace moves back (left) one character (also Control/H)

Delete means "delete last character" (also Control/A)

Control/S means "delete next character"

Control/Q means "delete line" (Also Control/U)

Control/Y means "move to begining of line"

Control/B means "move to end of line"

When a keyword is required,

a) a default keyword is always available, if Control/D is typed

b) entering garbage will produce a list of keywords which are valid in context;

c) UPPER and lower case letters are treated identically.

d) Any abreviation may be used which is unique in context.

Commands, sorts of node, types of relationship are examples of keywords.

5.6. Languages

The vocabulary used by ENQUIRE, and the keywords it accepts as input, are loaded from a special file on disk. It is therefore possible to alter the language the program uses, or the mood it communicates in. This is only of limited effect, as the program cannot, unfortunately, translate the entire database into a different language.

To use a different vocabulary, use one of the allowed language names as a command at the outer level of ENQUIRE.
Example:

```
[French      ]
Bonjour!

[Anglais     ]
Hello!
```

(User input is between [brackets])

5.7. Possible extensions

The following are extensions which could be provided to the system:

Sophisticated key searches of node names

Automatic generation of index files from ENQUIRE data

Automatic tracing of all dependant modules, component modules, or required modules for any node;

Various forms of hard-copy printout

A file tidying and garbage collecting facility for shortening files;

Global editing facilities for making many related changes to a file or set of files.