The USL/DBMS NASA/RECON Working Paper Series contains a collection of reports representing results of activities being conducted by the Computer Science Department of the University of Southwestern Louisiana pursuant to the specifications of National Aeronautics and Space Administration Contract Number NASW-3846. The work on this contract is being performed jointly by the University of Southwestern Louisiana and Southern University.

For more information, contact:

Wayne D. Dominick

Editor
USL/DBMS NASA/RECON Working Paper Series
Computer Science Department
University of Southwestern Louisiana
P. O. Box 44330
Lafayette, Louisiana 70504
(318) 231-6308
THE DESIGN OF PC/MISI, A PC-BASED COMMON USER INTERFACE TO REMOTE INFORMATION STORAGE AND RETRIEVAL SYSTEMS: PRESENTATION VISUALS

Philip P. Hall

The University of Southwestern Louisiana
Center for Advanced Computer Studies
Lafayette, Louisiana

April 24, 1985
THE DESIGN OF PC/MISI, A PC-BASED
COMMON USER INTERFACE TO REMOTE
INFORMATION STORAGE AND RETRIEVAL SYSTEMS

A Thesis
Presented to
The Graduate Faculty of
The University of Southwestern Louisiana
In Partial Fulfillment of the
Requirements for the Degree
Master of Science

Philip P. Hall
April 1985
OUTLINE

*** Problem Definition
*** The Personal Computer Solution
*** Goals of System Design
*** Design Description
*** Future Considerations
*** The Research Environment
*** Conclusions
PROBLEM DEFINITION

RATIONALE FOR COMMON INTERFACE

*** Content of IS&R Systems
*** Problems In Providing Access
*** Increase in PC Processing Power
*** Research Possibilities
DEFINING THE CASUAL USER

70% of User Population

Characteristics

No Desire to Memorize Command Languages

Infrequent Access to System

Limited Knowledge of Programming

Limited Knowledge of Command Languages

Extensive Knowledge of Subject Field

IS&R Access not REQUIRED By Job

Job Enhancement Thru IS&R Access
PROBLEM DEFINITION

CURRENT ACCESS METHOD

INFORMATION

INTERFACE

END

USER
PROBLEM DEFINITION

INFORMATION SPECIALIST USAGE

INFORMATION

INTERFACE

INFORMATION SPECIALIST

END USER
THE PERSONAL COMPUTER SOLUTION

REQUIRED PROCESSING CAPABILITIES

*** Translate User Input into Host System Commands

*** Interpret Host System Responses

*** Storage and Manipulation of Accessions Retrieved from Host

*** Utilization of Specialized Input Devices

*** Modification of Screen Display Characteristics
THE PERSONAL COMPUTER SOLUTION

POSSIBLE ACCESS METHODOLOGIES

*** Terminal -> Host

*** Terminal -> Gateway -> Host

*** Terminal -> Local Mainframe -> Host

    +-> Host

*** Personal Computer -> | -> Gateway -> Host

    +-> Local Mainframe -> Host

*** Distribution of Functionality
THE PERSONAL COMPUTER SOLUTION

INFORMATION

INTERFACE INTERFACE INTERFACE .... INTERFACE

PC M S I

END USER
THE PERSONAL COMPUTER SOLUTION

FEASABILITY OF IMPLEMENTATION

1) The identification of host system functions which are used by casual users

2) The determination that these functions are provided by the target systems

3) The identification of local processing needs

4) The development of a standard set of commands to be mapped into the required host system functions

5) The mapping of the standard command set into commands recognizable by the host system

6) The identification of hardware requirements for the implementation of the system.
GOALS OF SYSTEM DESIGN

GOAL 1: Design a system which allows ease of access to multiple information systems to both the casual user and the experienced user.

GOAL 2: Utilize the local processing capabilities of the personal computer to enhance the search and retrieval process.

GOAL 3: Design a system which provides the user with sufficient guidance and interactive capability to allow the utilization of his subject knowledge in the development of system search strategies.

GOAL 4: Design a system which utilizes state-of-the-art interface design tools available for personal computers while retaining maximum portability.

GOAL 5: Design a system which may be used for research activities related to the improvement of access to IS&R systems and which provides the necessary monitoring and evaluation tools for such research.

GOAL 6: Define future system enhancements.
FUNCTIONALITY REQUIRED

*** Remote Processing

*** Connect to System
*** Search Subject
*** Search Accession Number
*** Search Corporate Source
*** List Adjacent Terms
*** Boolean Operations
*** Print System News
*** Remote Print
*** Set Status
*** Sort Set

*** Local Processing

*** Save Accession
*** Merge Files
*** Name Download File
*** Display Accession

*** Disconnect from System
*** Search Author
*** Search Title
*** Display Accession
*** List Related Terms
*** Change Database
*** Limit Search
*** Search Text
*** Release All Sets
*** Sort File
*** Local Print
*** Delete Local File
*** Delete Accession
DESIGN DESCRIPTION

THE INTERFACE SUBSYSTEM

*** Three Levels of Interaction

*** Menu-Driven Interaction

*** Command-Driven Interaction

*** Direct System Interaction

*** Batch Processing Capability

*** Error Handling

*** Input Errors

*** Host System Errors

*** Local Storage and Processing of Accessions
DESIGN DESCRIPTION

THE TRANSLATOR/INTERPRETER SUBSYSTEM

*** The Translator

*** Convert PC/MISI Commands into Host Commands

*** Send Results to Communication Subsystem

*** Uses System Command Table

*** The Interpreter

*** Accepts System Response from Communication Subsystem

*** Interprets System Response

*** Performs Necessary Transformations on Host Response

*** Passes Result to Interface Subsystem
DESIGN DESCRIPTION

THE COMMUNICATIONS SUBSYSTEM

- Initialize Communications Parameters
- Transmit Commands to Host System
- Accept and Store Host System Responses
- Reset Communications Parameters
DESIGN DESCRIPTION

THE ADMINISTRATIVE SUBSYSTEM

*** Create and Maintain System Files

*** Access Sequence Files

*** System Command Files

*** System Response Files

*** System Security File

*** Utilization of Evaluation Monitors
DESIGN DESCRIPTION

RESOURCE REQUIREMENTS

*** User Requirements

*** IBM PC or PC Compatible

*** Minimum 256K Memory

*** Dual Floppy Drives or Hard Disk

*** Hayes-1200 or Compatible Modem

*** Light Pen (Optional)

*** Development Requirements

*** Hardware

*** IBM PC/XT

*** Hayes-1200 or Compatible Modem

*** Color Monitor

*** Light Pen

*** Software

*** C Compiler

*** Window Generation Library

*** Statistical Support Package
FUTURE CONSIDERATIONS

FUTURE ENHANCEMENTS

*** Expert System / AI Applications
*** Enhance User Queries
*** "Advice" to Users
*** "Find" System With Information

*** Organize Information into Reports

*** Extension to Generalized DBMSs
FUTURE CONSIDERATIONS

RESEARCH POTENTIAL

Menu vs. Command vs. Direct Access
(and later) vs. Common Commands vs. Natural Language

Interface Configurations

Input Devices

Display Characteristics

Expert System Applications

Extraction and Organization of Information
<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Natural Language/Expert System</td>
</tr>
<tr>
<td>4</td>
<td>Common Command Language</td>
</tr>
<tr>
<td>3</td>
<td>Menu Driven System</td>
</tr>
<tr>
<td>2</td>
<td>PC/MISI Command Language</td>
</tr>
<tr>
<td>1</td>
<td>Direct Interaction With Host</td>
</tr>
</tbody>
</table>
NASA
Personal Computer
Research
and
Development
PC R&D

R&D Support Activities

- Identification and Evaluation of Candidate R&D Projects
  - Continual Evaluation of New Hardware and Software

- Procedure and Specification
  - Project Re-evaluation

Education Support

- Simulator
  - IPDS
    - (textual)
  - Prototype System

Workstation Support

- Simulator
  - Graphics
  - Extensions
to IPDS

PC/MISI

Figure 5.
CONCLUSIONS

... Place of PC in Information Retrieval
... Feasibility of Implementation
... Research Potential
... Goal Attainment
OBJECTIVES OF SYSTEM DESIGN

OBJECTIVE 1: Provide Ease of Access to Multiple Systems.

OBJECTIVE 2: Provide for Addition of New Systems.

OBJECTIVE 3: Develop System Documentation

OBJECTIVE 4: Provide Multilevel Capabilities.

OBJECTIVE 5: Maintain User Orientation.

OBJECTIVE 6: Utilize User’s Knowledge.

OBJECTIVE 7: Facilitate Downloading of Information.

OBJECTIVE 8: Provide Batch Processing Capabilities.

OBJECTIVE 9: Provide Error Handling Capabilities.

OBJECTIVE 10: Extract Maximum Benefit from Display Capabilities

OBJECTIVE 11: Identify Necessary Data for Evaluation.

OBJECTIVE 12: Design Data Collection Tools.

OBJECTIVE 13: Identify Uses of Artificial Intelligence for Future Enhancements.

OBJECTIVE 14: Identify Multi-User Conversion Possibilities

OBJECTIVE 15: Maximize Flexibility.
## System File Descriptions

<table>
<thead>
<tr>
<th>File Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;System Name&gt;.DB</code></td>
<td>Contains valid databases for current SCT</td>
</tr>
<tr>
<td><code>&lt;System Name&gt;.host</code></td>
<td>Contains access sequence for <code>&lt;System Name&gt;</code></td>
</tr>
<tr>
<td><code>&lt;System Name&gt;.SCT</code></td>
<td>Contains SCT for <code>&lt;System Name&gt;</code></td>
</tr>
<tr>
<td><code>&lt;System Name&gt;.IT</code></td>
<td>Contains IT for <code>&lt;System Name&gt;</code></td>
</tr>
<tr>
<td><code>Trans.in</code></td>
<td>Communication from Interface to Translator</td>
</tr>
<tr>
<td><code>Trans.out</code></td>
<td>Communication from Translator to Interpreter</td>
</tr>
<tr>
<td><code>Inter.in</code></td>
<td>Communication from Communicator to Interpreter</td>
</tr>
<tr>
<td><code>Inter.out</code></td>
<td>Communication from Interpreter to Interface</td>
</tr>
<tr>
<td><code>ParamN.out</code></td>
<td>Communications Parameters (N is a variable value)</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>COS</td>
<td>Connect to system</td>
</tr>
<tr>
<td>DIS</td>
<td>Disconnect from system</td>
</tr>
<tr>
<td>SED</td>
<td>Select Database</td>
</tr>
<tr>
<td>FIS</td>
<td>Find Subject</td>
</tr>
<tr>
<td>FIA</td>
<td>Find Author</td>
</tr>
<tr>
<td>FIT</td>
<td>Find Title</td>
</tr>
<tr>
<td>FIC</td>
<td>Find Corporate Source</td>
</tr>
<tr>
<td>LAD</td>
<td>List Adjacent Terms</td>
</tr>
<tr>
<td>LIR</td>
<td>List Related Terms</td>
</tr>
<tr>
<td>DIA</td>
<td>Display Accession(s)</td>
</tr>
<tr>
<td>COS</td>
<td>Combine Sets</td>
</tr>
<tr>
<td>PRR</td>
<td>Print Remote</td>
</tr>
<tr>
<td>SYN</td>
<td>System News</td>
</tr>
<tr>
<td>SET</td>
<td>Search Text</td>
</tr>
<tr>
<td>FTN</td>
<td>Find Accession Number</td>
</tr>
<tr>
<td>LIM</td>
<td>Limit Searches</td>
</tr>
<tr>
<td>SES</td>
<td>Display Accession Set Status</td>
</tr>
<tr>
<td>REL</td>
<td>Release All Sets</td>
</tr>
<tr>
<td>SOR</td>
<td>Sort Set</td>
</tr>
<tr>
<td>CHAF</td>
<td>Change Download File</td>
</tr>
<tr>
<td>SOF</td>
<td>Sort Local File</td>
</tr>
<tr>
<td>MEF</td>
<td>Merge Local Files</td>
</tr>
<tr>
<td>PRL</td>
<td>Print File on Local Printer</td>
</tr>
<tr>
<td>DET</td>
<td>Delete Download File</td>
</tr>
<tr>
<td>DIF</td>
<td>Display Records in Local File</td>
</tr>
<tr>
<td>DER</td>
<td>Delete Record from Local File</td>
</tr>
</tbody>
</table>

This report represents one of the 72 attachment reports to the University of Southwestern Louisiana's Final Report on NASA Grant NGT-19-010-900. Accordingly, appropriate care should be taken in using this report out of the context of the full Final Report.