Fiction world: a prototype Graphic User Interface

This item was submitted to Loughborough University's Institutional Repository by the/ an author.

Additional Information:

- A Master's Thesis. Submitted in partial fulfilment of the requirements for the award of Master of Philosophy at Loughborough University.

Metadata Record: https://dspace.lboro.ac.uk/2134/28320

Publisher: © A. Amudhavalli

Rights: This work is made available according to the conditions of the Creative Commons Attribution-NonCommercial-NoDerivatives 2.5 Generic (CC BY-NC-ND 2.5) licence. Full details of this licence are available at: http://creativecommons.org/licenses/by-nc-nd/2.5/

Please cite the published version.
This item was submitted to Loughborough University as an MPhil thesis by the author and is made available in the Institutional Repository (https://dspace.lboro.ac.uk/) under the following Creative Commons Licence conditions.

For the full text of this licence, please go to:
http://creativecommons.org/licenses/by-nc-nd/2.5/
FICTION WORLD: A PROTOTYPE GRAPHIC USER INTERFACE

by
A. AMUDHAVALLI

A Master's Thesis submitted in partial fulfilment of the requirements for the award of
MASTER OF PHILOSOPHY

RESEARCH SUPERVISORS: Ms. Ann O'Brien & Mr. Alan Poulter
DIRECTOR OF RESEARCH: Dr. Paul Sturges

Department of Information & Library Studies
Loughborough University of Technology
November 1992

Copyright by A. Amudhavalli
# CONTENTS

Acknowledgements.............................................................................................................. i
Abstract.................................................................................................................................. ii
List of figures.......................................................................................................................... iii

1. Introduction ................................................................................................................... 1-15
   1.1. OPACs: general concepts.......................................................................................... 1
   1.2. OPACs: historical perspective ................................................................................. 3
   1.3. Project background ................................................................................................. 12
   1.4. Thesis organisation ................................................................................................. 13
   1.5. References and notes .............................................................................................. 15

2. Methodology .................................................................................................................. 16-48
   2.1. Literature Review .................................................................................................... 16
       2.1.1. OPACs ............................................................................................................ 16
       2.1.2. Fiction ........................................................................................................... 24
           2.1.2.1. Fiction use and user surveys.......................................................... 24
           2.1.2.2. Enhanced catalogue access to fiction........................................... 26
       2.2. Need for the study .............................................................................................. 32
   2.3. Objectives of the study ......................................................................................... 37
   2.4. Scope and coverage of the study .......................................................................... 38
   2.5. Limitations of the study ...................................................................................... 40
   2.6. Methodology ......................................................................................................... 41
   2.7. References and notes ............................................................................................ 44

3. Fiction World: system description .............................................................................. 49-73
   3.1. References and notes ............................................................................................. 73

4. Fiction World: system evaluation & conclusion ......................................................... 74-85
   4.1. Need for evaluation ............................................................................................... 74
   4.2. Fiction World: evaluation ..................................................................................... 75
       4.2.1. Purpose .......................................................................................................... 76
       4.2.2. Scope ............................................................................................................. 76
       4.2.3. Methodology .................................................................................................. 78
       4.2.4. Results .......................................................................................................... 78
   4.3. Inferences ............................................................................................................... 82
   4.4. Concluding remarks .............................................................................................. 83

5. Bibliography .................................................................................................................. 86-93
6. Appendices ..................................................................................................................... 94-97
ACKNOWLEDGEMENTS

The researcher gratefully acknowledges her two supervisors, Ms. Ann O'Brien and Mr. Alan Poulter for their kind cooperation, patience, steadfast encouragement, extensive guidance and substantial contributions from the day of commencement to the day of completion of the final report of the project undertaken.

The researcher would like to thank Dr. Paul Sturges, Director of Research, and Professor John Feather, Head of the Department for the support and facilities provided for the candidate during the project period at the Department.

The researcher expresses her appreciation for the significant suggestions offered by the six PG students in testing the system.

The researcher owes a special thanks to Mrs. Smith for her generous guidance and cooperation in preparing the bibliography.

The researcher remembers Mr. Dave Hill, Technical Tutor in the Department of English & Theatre, Loughborough University for his timely help in recording the sound effect.

Finally, the researcher gratefully acknowledges the British Council Division, UK and Madras for the financial and administrative support provided for this study and the Government of India and University of Madras for permitting to undergo this study.
ABSTRACT

'Fiction World' is a graphic user interface system aimed at supporting novice users developed with HyperCard in an Apple Macintosh environment. A multidimensional framework for fiction grouping towards enhanced subject access with a working model on sports fiction is attempted, establishing a matching link between the users' search strategies and the contents of the database. The experimental "SPORTS FICTION DATABASE" contains one hundred works of fiction distributed amongst five sporting settings: AMERICAN FOOTBALL, BASEBALL, HORSE RACING, and MOUNTAINEERING. To this end, image, sounds and text are integrated to develop an user-friendly interface establishing an effective interaction between the user and the system. Finally, the designed system was tested in the laboratory environment in a limited way. The reporting of this prototype system encompasses the planning, functionality, and evaluation of Fiction World supported with necessary screen pictures.
LIST OF FIGURES

1. Fiction Main Menu
2. Apology Note (on selection of a fiction category other than sports fiction).
3. Access Points to Fiction World
4. Author Index
5. Author Index on Selection
6. Cover Page of a Document
7. Cover Page on Selection of 'OTHER TITLES'
8. Author-Title List on Selection of 'MORE AUTHORS'
9. Sports Fiction Main Menu
10A. Sports Fiction Sub-Menu - ANIMAL SPORTS
10B. Sports Fiction Sub-Menu - BALLGAMES
11. Author-Title List on Selection of 'AUTHOR-TITLE INDEX'
12. Fiction Features - HORSE RACING, AMERICAN, FOOTBALL, & BASEBALL
13. Fiction Features - MOUNTAINEERING
14. Fiction Features - HUNTING
15. Fiction Features with Pulledown Menu Listing Index Terms
16. Bibliographic Record (A sample entry screen)
17. Help Screen
CHAPTER ONE
INTRODUCTION

The first chapter of this project report introduces briefly the concept of online public access catalogues (OPACs) and highlights the major developments in this area, with a historical perspective. However, the emphasis is more on human computer interaction and its implication on graphic user interface design approach. It gives details of the project's background and concludes with the structural organisation of the reporting of this project.

1.1. OPACs: GENERAL CONCEPTS

Computerisation of cataloguing services in libraries, be it academic, public or special is generally regarded as both inevitable and desirable in present day information society. It is clear that public service aspects of online catalogue implementation are of considerable interest. Both library staff and patrons are seeking to forge new roles for themselves in this context, as varied forms of catalogues proliferate.

The introduction of online catalogues has had the impact of diminishing the use of the older forms of catalogue, be it card or microforms. There can be legitimate reasons for favouring one catalogue over the other for particular reasons and interests. The
findings of the nationwide study by the Council of Library Resources in 1982 revealed strong acceptance of this new form of the library catalogue both by library staff and patrons (1). With this new form of catalogue in the making, system designers now have the opportunity to meet such needs and expectations of catalogue users that were never possible with the traditional catalogue.

Thus central to the concept of an interactive online catalogue is the accessibility to bibliographic and other information by the public, without the human intermediary. Hence, the popular label for this concept is OPAC (Online Public Access Catalogue). Ideally, as in the words of Hildreth, an OPAC is a "computer-based and supported library catalogue designed to be accessed via a terminal so that library patrons may directly and effectively search for and retrieve bibliographic information without the assistance of an intermediary such as a specially trained member of the library staff" (2). An OPAC can be characterised as being an Information Retrieval System (IRS) for users from widely varied backgrounds, which despite the absence of a human intermediary, is readily, efficiently and pleasantly usable. As an interactive system, an OPAC can dynamically communicate with its users; it can be responsive and informative at a given time to a given need. Its chief attraction is the provision of a much greater range of 'sophisticated' access points for 'unsophisticated' users. As
Stephen Walker has pointed out "OPACs are Information Retrieval Systems not unlike online retrieval systems such as DIALOG"(3). Thus, an OPAC can be referred to as an interactive search module of an automated library system or an independent library retrieval system.

OPACs have the ability to revolutionise the way individuals access information. Towards this common cause of developing friendly and helpful public access information retrieval systems, a number of efforts are continuously under progress. In this way, OPACs have gradually evolved with different systems and with different approaches.

1.2. OPACs: HISTORICAL PERSPECTIVE

Despite the proliferation of literature in this area, as well as developments in Information Technology (IT), amazingly, only "a dozen different online catalogue systems can be found in hundreds of libraries in North America and Europe"(4). The introduction and development of OPACs in the UK was indeed slow and little progress was made until 1982. More significantly in that year a start was made by the Polytechnic of Central London on the OKAPI (Online keyword Access to Public Information) project and the design of an OPAC to run on a local network. Also, in the early years of that decade several projects had been sponsored by the British Library
Research and Development Department (BLR&DD), as well as considerable research activity by individual institutions. Examples included the University of Hull the Cranfield Institute of Technology and Bath University (5). Bath University's nation wide survey project on catalogue use in 1982 contributed towards the identification of potential problem areas for further research in the area of OPACs (6). Most work during this early period chiefly focused on the monitoring of existing OPAC systems. Later experimental research moved towards improved design in OPAC systems. This was made possible due to the spectacular advancements in the supporting technology - Computers and Communication Technology - which led to a flourishing of new applications.

These stages of progress in this area has been characterised by Hildreth as three generations of online catalogue development (7). This revealed the qualitative stages of evolution in the production and design of OPACs. Each generation has a characteristic set of features. The first generation was characterised as being 'known item' finding tools, with few access points (Author, Title) to brief bibliographic records. And it provided a single mode of interaction with the system. The second generation, to quote Hildreth “represents a marriage of the library catalogue and conventional online information retrieval system (IRS)”(8). This system facilitated
pre-coordinated phrase searching and browsing options (along with keyword/Boolean capabilities). Unlike the first generation, the second provides more online user assistance in the form of menus, help displays, suggestive prompts and error messages. However, this system falls short of open-ended, exploratory searching, automatic assistance to users and free text search terms. And the third generation, is according to Hildreth "one incorporating a few advanced measures and commonsense enhancements to overcome the shortcomings of the first two generation online catalogue systems" (9). He concludes that the retrieval effectiveness can be enhanced by the following three ways:

1. Technical performance (both of systems and communication technology);

2. Enriching the records with improved structure and content of the bibliographic database; and

3. Improving the user-system interaction with richer dialogue and online assistance and guidance to novice users.

A number of investigations began exploring the potentials of enhanced communication between man and machine.

Computer systems, although designed to run autonomously, must have a user interface through which human users and
computers interact. The user interface is recognised as the single most significant factor in determining the success or failure of the system. This fact, has led to much research efforts on the systems' design, focussing on search sequencing and visual browsing, for example, screen layout, content, typography, screen instructions towards user assistance, etc. The human-computer interface is defined by Dumas as "the words and symbols that people see on the computer screen; the content and layout of displays; the procedures used to enter, store and display information; and the organisational structure of the interface as a whole"(10). With such human-computer interfaces, the computerised systems are becoming highly user-dependent and context-oriented.

The computer has evolved from a programmers' tool to a general purpose tool for everyone. There seems to be a progressive shifting of the burden of procedure from users to machines, which calls for improvised access requirements in response to users who are intolerant of 'unfriendly' systems. To quote Foskett, "user-friendliness consists of providing library and information systems that makes sense to its users, make them comfortable and confident that they understand the system and how to use it"(11).

Attention to end-users, has created a lot more emphasis on
sophisticated software interfaces acting as gateways or front-ends. In contrast to earlier software, the current trend is towards developing software using a Graphical User Interface (GUI). GUI is an "interface that relies on images such as icons as well as text, operates in graphics (rather than text) mode, is manipulated by a pointing device (typically a mouse) and allows direct manipulation of screen objects" (12). Such interfaces help users to increase productivity with its simplified tasks and clear direct procedures to interact with least effort.

It is useful to group user interfaces into two broad categories, based on their interactive structure, viz.:

1. CONVENTIONAL INTERFACES; and

2. DIRECT MANIPULATION INTERFACES.

The former one offers a single, general input device such as a keyboard and command language or a menu for all kinds of input. The term 'Direct Manipulation' was coined by Shneiderman. It is used by him to refer to interfaces having the following features:

1. continuous representation of the object of interest;

2. physical actions or labelled button presses instead of complex syntax; and

3. rapid incremental reversible operations whose impact on the object of interest is immediately visible (13).
More recently, direct manipulation systems have been appearing with reasonable frequency. Historically, the first major landmark is Sutherland’s ‘Sketchpad’, a graphical design program (14). Sutherland’s ideas took more than two decades to have widespread impact, perhaps due to the limitations of supporting technologies.

The notion of direct manipulation carries two distinctive aspects of the feeling of directness, viz., 1. Distance (between one’s thoughts and the physical requirements of the system under use); and 2. Engagement (the qualitative feeling that one is directly manipulating the objects of interest). The former one is measured in terms of two chief properties, which include: 1. Semantic Directness; and 2. Articulatory Directness. The ‘semantic directness’ has to do with the relationships between users’ intentions and meanings of expressions, whereas, ‘articulatory directness’ has to do with the relationships between the meanings and expressions and their physical form. In general, the latter is highly dependent upon input/output technology which most systems currently have. The manipulation of displayed items is increasingly accomplished by the use of pointing devices, especially the mouse. The mouse provides articulatory direct input for any task that can be represented
spatially and graphically. Pictographic and iconic languages are examples of articulatory representation in which the form of the expression is related to its meaning. And this appear to be a more effective method of conveying information than alpha-numerics.

Pictographic interface language is gradually becoming popular in designing a 'user-friendly' and 'easy-to-use' OPACs. High resolution (bit mapped) displays are increasingly common, making allowances for innovative dialogue elements, such as icons and windows, to be more practicable. Multi-modes of interaction are increasingly employed. There is the possibility these days with sophisticated software to integrate image, voice, text and of tactile, verbal or visual input and output modalities in current interfaces. Undoubtedly, multi-dimensional and multi-media interfaces have the potential to enhance human-computer interaction in terms of minimised processing time, optimised information exchange etc.

Iconic interface language is becoming an increasingly important part of the visual interface to computer systems. Icons are small graphical images used as representations that stands for its objects or functions. The most common example is that an object such as file might be deleted (function) by dragging its icon to a trash-can icon (another object). Pictures or icons are used to represent functions on
a menu-like display. To select a function, users can point at an icon with the cursor employing a mouse pointing device. Icons are a very effective technique, provided the icon-pictures are realistic, because the learning time is reduced and operation becomes very easy for novice and expert users as well. This technique has been used extensively by Xerox and Apple. Icons, however, have limitations of individual differences in interpretation and therefore usually have to have some clarifying text associated with the image. Also icons take up a considerable amount of space of VDU screens and their descriptive power is poor, when more abstract concepts are being represented such as validating, linking and sorting. So the technique is not really more economical than standard menus when displaying a large number of choices. However, icons create meaning by being realistic and this works well for concrete objects such as files, incoming messages. It can be said that icons are useful as long as they are individual and unambiguous.

The key issue now of much concern centres over the best ways to utilize graphics capability and integrate multiple modes of interaction. The layout and formatting of screen-based information is an important determinant of human performance with a computer system. Windowing represents a great advance in cognitive terms, since it has the potential to provide users with a more effective
utilization of display area, which is, at the same time, more consistent with the way people need to deal with information. Given that windows are an attractive proposition for displaying information, this does not actually alter the fact that poor formatting of that information can still reduce its value immensely. When a picture is worth a thousand words, this becomes an unviable situation with respect to the efficiency of person-to-person and person-to-computer interaction. Interactive graphics capabilities seem to enhance and extend the scope of the human-machine dialogue, making it much more effective and efficient.

Thus it can be concluded that direct manipulation through graphic interaction is established as a new interaction style. It has become very popular for modern computer systems and as said earlier this technique has been used extensively by Apple Macintosh. However, one of the chief problems the graphic user interface designer may encounter in the process is in creating effective and appropriate graphics leading to better understanding by the user of the interface.

With the availability of such software facilities, as well as hardware developments, Information Retrieval Systems (IRS) begin where the conventional systems end, with regard to functionality, usability, and performance. One such sub-system of IRS is OPACs.
OPACs are appreciated for their self-helpfulness. In such environments where users play a more significant role than in those traditional library systems, better and more user-friendly OPACs are needed.

Hence, it can be said that OPACs and related end-user systems can be a fertile ground for further research, experimentation and development. Most of the existing OPACs are (for a variety reasons and circumstances) not equally 'user-friendly' and 'easy-to-use' by novice users. And another major need is to improve the subject retrieval in OPACs. These two can be achieved. It requires only concentration of the research community in this field to exploit the facilities that the supporting technologies have offered. One such attempt in this direction is the present project as presented in the subsequent chapters.

1.3. PROJECT BACKGROUND

The present project entitled "FICTION WORLD: A PROTOTYPE GRAPHICAL USER INTERFACE DESIGN" forms to be an extension of the OPAC Research programme at Department of Library & Information Studies, Loughborough University of Technology, which envisages the practical ways of developing novel user interfaces, using conventional bibliographic data, but allowing an enlarged set of access points and
better exploitation of subject information. This programme as proposed by the Department recommends the application of the two software packages - HyperCard and FileMaker Pro - in the implementation of the task. The Department is the host of the working team consisting of four members from India sponsored under the Technical Cooperation Training Programme, British Council Division, Uk. This project set for twelve months duration at the PostGraduate Research level is directly supervised by Ms. Ann O'Brien and Mr. Alan Poulter. The Director of Research is Dr. Paul Sturges. This programme offers individual topics of an academic and practical nature for each of the team member. Each member presents the designed user interface working within the experimental database in a selected specific subject area. The presentation reported here is the description of one such prototype graphic user-based interface design system developed with HyperCard in an Apple Macintosh environment in the chosen subject area SPORTS FICTION.

1.4. THESIS ORGANISATION

The reporting of the project includes the planning, functionality and evaluation of Fiction World developed by the researcher. It is organised into four chapters under the following chapter headings:
1. Introduction

2. Methodology

3. Fiction World: system description

4. Fiction World: system evaluation and conclusion

Each chapter begins with a short introduction, which typically includes a brief chapter summary. The next chapter focusses on the planning of the project. This includes a literature review, objectives, scope and coverage, limitations of the project and the methodology adopted in the design process. The third chapter describes in detail the functionality of the developed design. The final chapter concerns itself with the testing of the interface system design and the related feedback, and concludes with necessary and possible improvements over the present design in the future.
1.5. REFERENCES AND NOTES


8. Ibid.


14. Ibid.
CHAPTER TWO

METHODOLOGY

This chapter commences with a brief review of the literature on use and users of OPACs since their introduction in 1979/80, which emphasises the need for undertaking a study of this kind and proceeds to specify the objectives of the project. It further, outlines the scope and coverage of the study and focuses on the limitations faced by the researcher in the execution of the programme. Finally, it presents the methodology adopted in developing the undertaken task of designing user interface with the chosen software.

2.1. LITERATURE REVIEW

The review of literature presented here is twofold. It begins with a summary of items published related to OPACs and ends with those related to fiction user studies.

2.1.1. OPACs

The rapid proliferation of installed OPACs almost matched by the attention to end-users has led to numerous research studies to determine
the use, needs and problems experienced by those using OPAC systems. The published literature on OPAC activities has become voluminous in just a few short years. Librarians and the commercial sector have a vested interest in OPAC research. OPAC has become a popular theme discussed at almost every library conference at all levels. This has triggered for a renewed and widespread interest in related research activities.

OPAC research should be viewed as an open, relevant ongoing research process leading to a large amount of literature in this field. Much of the current OPAC research is both practical and visionary, unlike the passive research in the past. The major contributions to this area originates from USA. One of the earliest and significant OPAC study, though quite outdated in the present day advancements, was the extensive nationwide project in 1982 funded by Council for Library Resources (CLR) USA, resulting in a series of publications. However, the introduction and development of OPACs in UK was much slower. Perhaps the significant and longest running series of OPAC experiments in UK is the OKAPI (Online Keyword Access to Public Information) online catalogue research studies conducted at the Polytechnic of Central London (Now at City University), since 1982 (1). These are funded mainly by the British Library Research & Development Department, British Library. Several reports of the experiments have been published, but
the important OKAPI research programme is still too little known outside the UK. Apart from these specially constructed research team efforts supported by grant funds, there are also quite a large number of studies reported in the published literature in this area by individuals from USA and European countries.

The emphasis here is on current literature only, as most of the retrospective literature is now obsolete and redundant. However, the literature review attempts to identify the pioneers in this field, who have not only initiated the OPAC research activity, but also are established as experts in the area, influencing their successors to work with continued interest. Hence, the following list runs in that order from pioneers to present day contributors to this area.

A selective chronological list of contributors to this field includes: MILLER (1979); PRITCHARD (1979); DOWLIN (1980); KASKE (1980); PAWLEY (1980); SHNEIDERMANN (1980); ANDERSEN (1982); COCHRANE (1982); GOUKE & PEASE (1982); HILDRETH (1982); INGWERSEN (1982); LAWRENCE (1982); MATTHEWS ET AL (1982); BORGMAN (1982); FAYEN (1983); FERGUSSON (1983); LARSEN (1983); MARKEY (1983); SANDER (1983); SEIGAL (1983); STEINBERG (1983); TAYLOR (1983); MITEV (1985); BATES (1986); KINSELLA
(1986); NORMAN & DRAPER (1986); SVENONIUS (1986); WILLIAMS (1986); BLAZEK & BILAL (1987); ALLEN (1988); DAUGHERTY (1988); GREENWOOD (1989); WIBERLEY (1989); YEC & SOTO (1989); AKEROYD (1990); EFTHIMIADIS (1990); CONNELL (1991); HUSTON (1991); HUFFORD (1991); KING (1991); LENHAM (1991); RENFRO (1991); RETLEV (1991); WIDDOWS ET AL (1991); COUSINS (1992); HANCOCK-BEAULIEU (1992) etc.

Followed by the contributors list on this area, is given the list of primary journals in the core discipline, library and information science reporting the work of the above said researchers. This list include: COLLEGE AND RESEARCH LIBRARIES; DATABASE; INFORMATION PROCESSING AND MANAGEMENT; INFORMATION TECHNOLOGY AND LIBRARIES; JOURNAL OF THE AMERICAN SOCIETY FOR INFORMATION SCIENCE; JOURNAL OF DOCUMENTATION; JOURNAL OF LIBRARIANSHIP; LIBRARY HI TECH; LIBRARY TRENDS; LIBRARY RESOURCES AND TECHNICAL SERVICES; ONLINE; and PROGRAM. Besides this regular stream of journal literature, there are a few single sources like books by different researchers. To quote a few may include Hildreth (2), Cochrane (3), Fayen (4), Markey (5), Matthews (6) and Mitev (7) etc. There are large number of published and unpublished project reports and conference proceedings fairly wide spread in the volume of literature in this area. Two such works which have provided the
researchers lots of insight into this area include those edited by Kinsella (8) and Williams (9). There are also a few exclusive journal issues devoted to work in this area, which are like Annual Review of Information Science and Technology (10), Program (11), and Library Trends (12).

The subject focus of this scattered literature may be generalised under the broad five subject headings viz: 1. TECHNICAL PERFORMANCE STUDIES; 2. INFORMATION RETRIEVAL PERFORMANCE STUDIES; 3. PUBLIC USAGE STUDIES; 4. USE PATTERN STUDIES; and 5. IMPACT STUDIES. Technical Performance Studies deal with the computer work load, the response time or the required number of terminals. Information Performance Studies compare search keys versus key word searching, title searches in OPACs and in card catalogues or retrieval results using different features. Public Usage Studies report which types of users use or do not use OPAC and the reasons for the same. Use Pattern Studies monitor the number of known-item versus subject searches, their utilisation and success and various search criteria applied by users or the pattern of users' errors in searching the OPAC. Impact Studies are concerned with how well users react to and accept these new computer systems as compared with traditional catalogues. In general, all these studies reflect users' general characteristics, their attitudes and approaches, users' physical and psychological
behaviour, types of searches and problems encountered by them with OPACs. A few studies compare the use of two systems in an experimental manner, in order to support the choices of a system by a library. Another major item found amongst the literature on OPAC is on research methodology and the different techniques employed in different studies appropriate to the context.

It is also observed that the common form of evaluation adopted in conduction of the aforesaid studies include Questionnaire, Interview, Transaction Log Analysis, Focus Group Interview Research, Protocol Analysis, Controlled Experiment, Talk Aloud Method etc.

Research into use and users of OPAC have identified the constraints and problems faced in interaction. They are found to differ from context to context, as users' needs and backgrounds vary and which are also highly flexible. As members of 'online culture', they seem to expect "immediacy of access and focus on results and not procedures.........they demand speed, not deliberation and prefer dual communication and expect openness, interconnection and extensibility"(13). Each library patron comes to the online catalogue with a unique combination of need, general and/or specific and also from different backgrounds and experiences. They expect the
system to be user-friendly and one which provides and leads the right number of appropriate features and functions for the user to perform the current task.

Hildreth emphasises that “subject browsing is a primary search activity to discover materials on a topic or to discover unknown items of potential interest”(14). Markey’s study reveals that “in both card catalogues and OPAC studies, users have been asking for increased subject information in catalogue records”(15). She suggests that “displaying records in the order of class number may increase user’s understanding of the search process”(16). Tague’s studies of user-system interaction in bibliographic searching lead her to urge improvements to OPACs in the following two areas: “increased variety in the language of bibliographic description; and subject indexing, including an expanded ‘entry’ vocabulary linked to terms in the system’s vocabulary and the development of adaptive, responsive interfaces able interactively to teach and explain the content and workings of the OPAC system being used”(17). Svenonius notes that “.......... most users do not have the verbal imagination to conceive all possible search terms and even if so, they may not have time to key in all the possible search terms”(18). Hildreth opines that “alternative design models of retrieval methods which support the separate needs and modes
of searching behaviour should be integrated into improved subject OPACs"(19). However, it can be assumed that users may prefer the classified approach for the alphabetical index, which needs to be borne in mind while designing the OPAC information retrieval system. The underlying assumption of this is that more informative, flexible, and intelligent browsing facilities are warranted and perhaps can be provided in an online environment.

Thus, the chief findings relevant to the present project’s interest as gathered from sources cited earlier, can be summarised as follows:

1. Most of the catalogue users want materials on a specific topic of interest.
2. The predominant mode of searching is for subject.
3. Most of the problems are with subject searching.
4. The highest priority for improvements is placed on various subject search enhancements.
5. The most demanding feature of OPACs is the ease of use fast access and retrieval.
6. The latter studies emphasises more on user reactions to the system than on use patterns.
In the light of the above findings, OPAC research is urging the researchers to reexamine traditional assumptions and in providing improved information retrieval system opportunities must be glanced. Today's OPAC research and design activity raises the sights and reveals collection access and information retrieval system possibilities never dreamed of before the advent of online catalogues. Requirements for and features of the emergent quality OPAC are now coming into clearer focus, thanks to abundant research on the performance and the use of OPAC systems.

2.1.2. FICTION

Turning to fiction, the literature review encompasses two aspects from this project's approach. The first part of the literature review is related to major studies reflecting the behaviour and use pattern of fiction borrowers. The second chapter proceeds to emphasize efforts directed towards enhanced catalogue access, especially subject access to fiction collection in a library.

2.1.2.1. FICTION USE AND USERS' SURVEYS

A careful examination of a few as representatives of the large number of survey reports (few of which are postgraduate dissertations) in this area has revealed some interesting findings. A selective set of inferences relevant
to the present project has been given below:

1. "59% of the fiction reading public prefer fiction categorisation; 
   24% prefer alphabetical sequence; and 16% had no preference"(20).

2. "81% looked for a particular type of novel; 60% for a particular 
   author and 35% sometimes looked for a specific title"(21).

3. "76% found very difficult to choose fiction and 34% found it easy 
   to choose. Both these responses seem to indicate market for 
   increased guidance....."(22).

4. "The browsers are influenced by the blurb"(23).

5. "bright attractive interesting covers are found to be ideal for those 
   who are unsure of what to borrow and are simply looking for"(24).

6. ".....library users were borrowing for a wide range of family, friends 
   and neighbours"(25).

7. "Readers counted on finding new authors and .....on rediscovering 
   authors whose names they had forgotten"(26).

8. ".....limitations that many library borrowers demonstrate in 
   choice of fiction arise mainly from their lack of knowledge of 
   alternative authors whom they might enjoy"(27).

9. ".....2/3s people (surveyed) to want to find "any novel of interest"
   is surely an indicator of a lack of information about what to
choose"(28).

10. ".... people seeking fiction in public libraries do not have a deal of knowledge of what to look for"(29).

11. " Browsing plays a very large part in readers' selection of fiction"(30).

12. "....majority of fiction readers prefer to select an item from a pre-defined range"(31).

The borrowers' experiences and researchers' opinions on the fiction user group being observed, the review of literature proceeds to examine the state-of-the-art of the fiction organization in the libraries.

2.1.2.2. ENHANCED CATALOGUE ACCESS TO FICTION

Literature published in this area reveals that, the most neglected subject of interest by the library organisers is the fiction area, despite the fact that a large part of the public library's major constituent, in terms of stock and usage is the fiction collection. Reports confirm the fact that fiction has been generally, "about 44% of the stock, but about 75% of the issues" (32), and "fiction is acknowledged to be the bread and butter of public libraries, forming around 70% of issues" (33).
It is observed by researchers that whilst readers for non-fiction have the advantages of classification, shelf guides and subject indexes, there are no such and, even if any, are not sufficient intermediaries between fiction stock and its readers. Usually the fiction users have to end up simply with mere alphabetical sequence of authors and/or titles. The prime reasons attributed for this plight by the researchers can be summarised as:

1. Fiction is regarded as less important part of the library service than the non-fiction; and
2. Lack of provision for depth classification of the works of literature compared to non-fiction.

The first reason can be substantiated as Intner speculates that "...such cursory access to fiction in libraries is that fiction being perceived as being unreal and non-factual, ..... less worthy of attention than non-fiction" (34). The second reason has been ascertained from Mai's discussion that,

"Indeed two of the major instruments for subject access, the Dewey Decimal Classification (DDC) and Library of Congress Subject Heading (LCSH) both contain explicit instructions not to provide topical subject access individual works of fiction with few exceptions. In LCSH topical headings are only assigned to biographical fictions, historical
fictions and animal stories. In DDC, individual works of literature may be classed as to subject only if they are “redeemed” by sufficient information content. In other words, in DDC topical subject access to a work of fiction only if it resembles a work of nonfiction” (35).

Neither of the above reasons seem to justify fiction’s second class treatment. It has been rightly pointed out by Sear and Jennings, “..... the perception by the readers that libraries are a lottery for selecting fiction does undermine any idea we might have as librarians that we provide a professional service as far as fiction provisions is concerned” (36).

Literature reveals that this gloomy and grim scenario of fiction organisation in libraries seem to be changing in the UK, other European countries and USA. For more than a decade Ainley, Atkinson, Betts, Mann and Walker (BRITISH); Pejtersen (DANISH); Baker and Shepherd, Harrell, Hayes and Sapp (USA) have been emphasising the need for greater access, particularly subject access to fiction.

Ainley and Totterdell in their compilation to provide a state-of-the-art of the experiments on fiction categorisation being carried out in British libraries emphasises that these are attempts to “break away from
traditional Dewey arrangements and present their stocks in new ways more appropriate to users, needs" (37). Atkinson (38) in his fourth chapter, "Promoting Fiction" discusses in length the classification of fiction, highlighting the need for helpful approaches to fiction classification. Betts opines that some systematic way of information on fiction and advice is needed for its user group. She offers two helpful suggestions in this regard: 1. "....within a genre or sub-genre the range of desirable authors could be extended......" (39) and 2. "..... if the catalogue were synoptic and the synopses could be keyword searched, we may be getting somewhere" (40). Mann (41) has published a series of papers and reports on promoting greater access to fiction collection satisfying the users. Walker's (42) fiction classification scheme is hybrid, influenced by Bliss and Ranganathan. The scheme analyzed fiction into facets of Author, Subject, Narrative, Language and Literary Period, which corresponds to Ranganathan's PMEST (Personality, Energy, Matter, Space and Time). The narrative/energy facet contains three sub-facets namely form, plot and style. Though complex, nevertheless it offers potential fruitful ideas for classifying fiction. The most recent publication in this direction is the reporting of the project completed by Phelan (43). His approach to presentation of materials in a hypermedia format, from the Dickens House Museum Library is a good example of improvised subject access to fiction in online catalogues. Lastly, the
responses from the British public libraries towards the current ongoing project to update Mann's "A readers guide to fiction" by Library and Information Statistical Unit (LISU), Department of library and Information Science, Loughborough University reveals that libraries are already on their way towards better access to fiction. To mention a few, libraries like Glasgow City Library, Cambridgeshire County Council Library Service, Hertfordshire and Worcester County Council Library Service, Essex County Council library Service etc seem to adopt the method of pasting either a graphic label or a label with a coloured spot on the spines of the documents indicating the fiction category.

Scandinavian librarians have attempted to develop online subject searching of fiction, both classified and alphabetical. The best known and the single major contribution of its own kind is the Danish project entitled "THE BOOK HOUSE" (44-46) built by the team under the leadership of Annelise Mark Pejtersen. This could be considered as one of the most ambitious and large scale projects towards enhanced online subject access to fiction retrieval. The classification scheme devised by A.M. Pejtersen is the Analysis Mediation of Publications (AMP) for use in public libraries. In this AMP system, which is even more complex than Walker's, the four independent user-determined dimensions include: Subject Matter; Frame
(Time/Place); Author's Intention; and Accessibility (44). Each of these
elements is further sub-divided. It can be said that perhaps it is the only
fiction analysis system that underwent large scale public test (45). The
results were good and encouraging further research in this area. Its visual
design and graphic interface has made the system more attractive, user-
friendly and easier to interact (46).

Turning to the American scene also seems to be encouraging. Baker's
study to determine if classifying fiction into genres could "focus use by
browsers ..." found that such arrangements did indeed improve service
to users" (47). Baker and Shepherd (48) had extensively reviewed various
genre identification systems used in American libraries. Harrell discovered
that, "46 out of 49 large American libraries (94%) used genre categorisation
to arrange and organise a part of their fiction collections" (49). Hayes (50
stated that the recent movement towards enhanced catalogue access
occurred in 1986 with the genesis of Subject Analysis Committee and its
Sub-Committee on Subject Access to Individual Works of Fiction, Drama.
Sapp emphasised that, "with improved subject access to fiction, readers' interests would be better served, and new innovative services could be
designed" (51).
These studies and efforts from different quarters indicate that the library organisers have been already attempting to provide their users with some form of enhanced catalogue access to fiction. Perhaps they are waiting and may welcome any better system in this regard. These are indications that the era of improvised subject access to imaginative literature has dawned upon us. Undoubtedly, these can be considered as encouraging factors for OPAC researchers to probe more into providing better access in fiction retrieval which conventional catalogues could not achieve in an effective way.

2.2. NEED FOR THE STUDY

The need factor is discussed from three points of view. Firstly, the need for novel interface design in OPAC systems in the light of the findings reported in earlier studies is stressed; secondly, to justify the choice of the subject area chosen to build a database for testing the developed interface. Lastly, the choice of the software to build the proposed design is emphasised.

The review of literature on use and users of OPAC proposes the need to design an OPAC that offers both functionality and improved screen design, which supports collaboration between a user and system. As
planners and designers of OPAC, constant awareness of the user population is an essential prerequisite. The focus then, must be on the stages of the knowledge, problems, needs, and interactions of the participants in the retrieval situation. This orientation reflects a critical shift in paradigm from an emphasis on systems from the systems’ perspective to one of users’ perspective.

It has been established that different levels and tasks of OPAC users have different needs and requirements. End-users are a growing heterogeneous population with a variety of information seeking behaviour. The assumption is that not all users are equal in their approaches while interacting with the information system. Failing to understand users’ needs can lead to risks. It has been widely suggested that improved users’ modelling could drive the design of an intelligent and novel interfaces enabling adaptive systems to be more successful. Hence, the designers ought to create improved systems that are tailored to the particular information needs of a specific user group, where both the novice as well as expert users of OPACs do not suffer at the cost of each user.

From the preceding section on catalogue access to fiction, it has been identified to be an area of the researchers’ focus and attention.
Being so, the researcher felt that the various problems faced by the users and organisers may well be solved in the present online environment, which is more productive with better hardware and software facilities.

As a step further observing the extent to which subject access are provided to retrieve fiction caused again dismay. Amazingly, the genre 'SPORTS FICTION' seems to have been almost totally ignored.

Interestingly, when the major secondary sources like the bibliographies (52) and indexes (53) etc. were analyzed, sports fiction has a place in their listing. However, it should be noted that all these sources have listed such works of fiction under a specific sport heading scattered at different places, rather than at one place under a single subject heading 'sports fiction'. However, the only two specific sources found on sports fiction which were an annotated bibliography (54) of novels, drama etc with sporting background and secondly, the conference proceedings on sporting fictions by the University of Birmingham in 1981 (55) stand as evidence of awareness of this category in the society.

Indeed many of the general public, who are by and large, fiction readers are sports enthusiasts. They may like to combine these two interests
while looking for an item in their fiction collection.

The above arguments regarding the fiction in general and particularly those with a sporting background prompted the researcher to choose this subject area, SPORTS FICTION, to be the experiment ground for developing and testing the proposed OPAC interface.

Lastly, the report proceeds to justify the software chosen to handle the proposed issue. Given the option to choose between either of the two software packages, viz., HyperCard and FileMaker Pro, the former was chosen for the present project for reasons highlighted in the subsequent paragraphs of this chapter.

HyperCard has been variously described by different authors, which have to some extent prompted the researcher to choose that particular software for the present purpose. To quote a few:

"HyperCard is an authoring tool and an information organiser..... to create stacks of information to share with other people. So, it is both an authoring tool and a sort of cassette player for information"(56).
"HyperCard is a friendly, easy-to-use software ‘erector set’" (57).

"HyperCard is “hypermedia”, as it gives the ability to move around in (navigate) and edit large amounts of information that is represented in many different forms, texts, pictures, sounds, animation and video frames. And it promotes the relationship of form and content" (58).

With all these descriptions of HyperCard, it can be substantiated that it is a combination of tools and techniques that make it possible, using easy programming language, to create custom applications that take advantage of its capabilities for random movement among the information segments.

HyperCard’s other feature is its scripting. It facilitates to link one piece of information to other within a stack or in different stacks, and for doing scripts that can range from simple to complex commands. “The language of HyperTalk is English, not symbols and can therefore be relatively easily used” (59). Although programmes can be extremely complex, they are built using standard words and phrases. Perhaps this ability to use uncomplicated, but effective techniques and to programme
utilising English language words and phrases must have been another reason for the choice of this software. And another two chief features, viz., expectation for repeated action from similar graphic representations and ability to share resources, are forceful educational tools that have also encouraged library professionals to use HyperCard. Given all these features, general and specific, HyperCard's strength seem to have infinite variety and expandability, including the potential use of multimedia products, nonlinear structure, ease of use, immediate feedback and response to actions, flexibility and the ease of transferring information among the stacks resulting in reduced development time.

The above arguments prompted the researcher to choose this particular software to build the proposed system.

2.3. OBJECTIVES OF THE STUDY

1. To design a prototype OPAC interface, incorporated with a multi-modal (visual, auditory, lexical etc.), functional, aesthetic and convivial user-oriented approach using the chosen software HyperCard;
2. To build a database with adequate bibliographic records in the chosen subject area Sports Fiction for the purpose of testing the designed system; and

3. To evaluate the developed design for improvement if any, as part of the design process to complete the task.

2.4. SCOPE AND COVERAGE OF THE STUDY

The scope of the study is to ascertain OPAC users in general and in particular fiction readers' information needs, behaviour and problems encountered in borrowing them from a library and information centre. The project explores the features of the chosen software package HyperCard to work in an Apple Macintosh environment. The task extends to map between the psychological (human) and physical (system) variables to arrive at the set objectives. For the purpose of testing the developed system, the database is built with a selected hundred items in the subject area, sports fiction.

These hundred items are equally distributed among the five selected representative sports, viz., AMERICAN FOOTBALL, BASEBALL, HORSE RACING, HUNTING AND MOUNTAINEERING with twenty items per
sport. The reasons for the choice of these said sports is twofold. Firstly, their quantitative feature and secondly, the salient features associated exclusively with each. It is observed from the secondary sources that comparatively greater number of works of fiction were found to be available with these five sporting backgrounds. The features shared by all categories of fiction include; Genre, Time and Place. The following three sports - American football, Baseball, and Horse Racing - feature additional elements like level, team and competition that can well express the content of the document matching the users' search pattern. Hunting and Mountaineering background also have their own exclusive elements such as types of animals hunted, and level and individual participation respectively.

A number of titles turned up as a result of determined browsing. Hence, the selection of items said above is somewhat subjective. The general criteria followed demanded that the works be written not earlier than 1950s and primarily for adults and with sporting background fully as subject and not as a passing reference, which are called as ‘border line’ titles. Within this predefined group, further care was taken to include the most recent works of fiction.
Lastly, it can be said that this project is a prototype system and has confined itself to a limited scope and coverage.

2.5. LIMITATIONS OF THE STUDY

This project also, as any other experimental project has its own limitations. The project's fixed duration of one year, being the chief limitation, has posed certain subsequent but vital limitations in carrying out the programme. These include:

1. To set the objectives of the task in hand that can be achieved within the given time frame.

2. To attempt for only an experimental prototype system and not an operational system developed in a real situation.

3. To assess the users' needs and behaviour empirically based on the literature reported in this area and not on field data exclusively conducted for the present project.

4. To choose a particular genre, i.e., sports fiction. Within sports fiction, also choice had to be confined to only a few selected type of
sporting backgrounds and in this case the five discussed in the preceding section.

5. To test the developed system for necessary modifications in a laboratory controlled environment only and not in a real situation and that also in a small scale.

2.6. METHODOLOGY

The interface design was developed within the given scope and coverage of the project as detailed above. The methodology adopted for this design process was set in six different sequential phases. The initial phase was to study the chosen software's features and potentialities carefully for the necessary application of the same towards the set objectives. The second phase, was to concern itself with the empirical analysis of the literature on the researcher's area of interest. The OPAC users' needs in general and with specific reference to the fiction borrowers' behaviour were to be analyzed in depth and the inferences synthesised. The third phase was directed towards the collection of the data for building the experimental database. Each selected item was to be recorded in slips for its bibliographic description along with a brief tailor-made summary of the content of the document. On completion of the data collection, the same was to be transferred in to the predefined screen format, resembling that of a typical traditional
catalogue card. The fourth phase was aimed towards the semantic organization of the data included in the experimental database. To this end, the selected documents were to be scrutinised to identify the relevant and adequate search terms to match the mapping between the users' search pattern and the existing database. The fifth phase was related to the main task of the project, ie to develop the physical design of the interface using the chosen software in the Apple Macintosh environment. As the sub-phase of this design process, the essential graphics and sounds (visual and auditory effect) were to be incorporated to enhance the aesthetic and convivial approach to the proposed user friendly interface. The final phase formed the testing and evaluation. As part of the design process, at different stages opinions and feedback from the supervisors, colleagues and friends, was planned to be sought periodically as a deliberate attempt to build a more helpful system. However, as the last phase of the design process a formal small scale evaluation of the developed system was decided to be carried out. To this end, two brief questionnaires were developed to test the system and to evaluate the users' response to the system under test respectively (APPENDIX 1 and 2). These questionnaires were put into pilot study with the cooperation of the supervisors. Finally, it was also decided to approach a selective group of volunteers to test the system. The valid and useful, but feasible suggestions, if any, had to be incorporated later into the system. It should be said that every phase of work was initially
to be sketched in paper form, especially the interface design, and later to be transferred to the computer system, as per the suggestion of the supervisors.

The work done at each and every phase is described in length in the next chapter, excepting the final phase - evaluation - which is presented separately with necessary concluding remarks summing up the evaluation results.
2.7. REFERENCES AND NOTES


10. Periodically *Annual Review of Information Science and Technology (ARIST)* reviews developments in online information retrieval and many ARIST chapters specifically has dealt with online public access catalogues. Example include: *ARIST*, 1985, 20, 234-85.


30. Goodall, ref. 25, p. 72.


32. Mann, ref. 27, p. 14.

33. Sear & Jennings, ref. 26, p. 112.


40. Ibid.

41. Peter H Mann has written a wide range of papers and reports on different aspects of fiction collection and organisation in public libraries.
libraries, fictional services and fiction borrowers' reading habits and borrowing pattern etc. A few of his works are cited in this section.


52. Bibliographies include: 1. *Whitaker's books in print*, a guide to British-in-print fiction. Its weekly format, *The Bookseller* renders subject arrangement; and 2. *British national bibliography*, follows the Dewey Decimal Classification which allows the grouping of novels and
novelists by period and places

53. **Indexes** include: 1. *The fiction index*, an annual with five year cumulations, since 1945; 2. Sequels, in its ninth edition the entries are from around 1950 to the end of 1988; 3. *A readers' guide to fiction* by Peter H Mann; and 4. *Bloomsbury good reading guide* by K McLeish.


CHAPTER THREE
FICTION WORLD: SYSTEM DESCRIPTION

The information retrieval situation is complex. This is significant for fiction retrieval where very few retrieval tools with subject access were available in libraries. Based on this particular postulate, a library prototype interface system called the FICTION WORLD was designed. The SPORTS FICTION DATABASE is the name of the experimental database with a total of one hundred adult fiction records with the chosen five sporting backgrounds - BASEBALL, AMERICAN FOOTBALL, HUNTING, HORSE RACING and MOUNTAINEERING with twenty items per sport.

To a large extent, this design owes much to the "BOOK HOUSE" project (1) which represented a step along the way to establish a user-based design approach within the area of fiction retrieval.

In fact, in a real life situation, the number of stored items in a database can be numerous; the number of features in the database can be complex; and the search attributes are not always well known
to the user. This reality has prompted the researcher to exploit the flexible display capabilities of computers to relate both information in and about the database as well as the various means for communicating with the database. This approach has given rise to an integrated representation for the "SPORTS FICTION DATABASE" which includes: 1. database format and contents; and 2. support for the associated information processing and retrieval. In the design of a prototype system for fiction retrieval, generalised concepts of sets of the collective needs of fiction user groups have been used as the conceptual foundation for the development. The design principles of the interface adopted, support the prime goal of the project to offer a novice user an amenable and differentiated access to the bibliographical database in a novel way. As a consequence, the problem domain application of the software (HyperCard), design principles, database structure and contents of the chosen subject (Sports Fiction) and the empirically analyzed needs of the users (Fiction Users) - is coordinated to implement functions at the front-end of the retrieval system.

The basic approach of the task began from the users' angle to the retrieval situation. The perception of users' needs was derived from empirical analysis of the studies as reported in the scattered
literature on this area. This revealed two chief search patterns of fiction users of a library. The first one was related to what is generally called 'known item search' and the second one was found to be vague and ambiguous searches within the framework of time, setting, plot or genre. This second approach seems to confirm the fact that users tend to characterize the book's contents from a number of different angles and in a multidimensional way. The former approach being the most popular search for fiction retrieval amongst the users, than for a nonfiction retrieval, to a large extent it is taken care of by the organisers of fiction collection in almost all the libraries. The latter approach, however, is found to be a sadly neglected area as far as shelf arrangement of the fiction collection are concerned. Two more interesting, but significant observations were made from the fiction users' search pattern relevant to the planning of the design process. The first one was that of the users' fascination for the physical format of the documents - a colourful and picturesque front cover and the back cover page with a brief 'blurb' - both of which are generally perceived for its denotative communication of the document's contents. The second feature was the habit of 'browse and choose', especially while selecting a fiction book on behalf of another user/s, either directly from the fiction shelves and/or by reading a fiction list carried along or supplied by the individual
It was noted that such search behaviour was shared in common by both children and as well the adult fiction readers. These four principal inferences of the empirical analysis of fiction users' needs served as initiatives for the researcher to proceed in the task towards an user based interface design.

The next phase of the design process was the need to get familiar with the computer environment to develop the proposed user interface design. This necessitated the process of learning and working in the Apple Macintosh computer environment with the given two software packages, viz., HyperCard and FileMaker Pro. It took considerable time to get through the system, which was quite new to the researcher. However, with the guidance from the supervisors and reading the handbooks and manuals on Apple Macintosh and the software packages, the researcher progressed in her attempt to learn the same. Over a brief period of time the researcher gained to some extent some confidence to proceed with the task.

As part of the learning process, a pilot experiment was undertaken. This involved the compilation of a selective bibliography entitled "Usage of OPACs" using both software packages. This enabled the researcher to
decide on the selection of one of them for the accomplishment of the main task. The decision was in favour of the software HyperCard, which was found to be more flexible and suitable for the given purpose than the other software. The varied reasons for such a preference has been already discussed in the earlier chapters. However, it should be reemphasised that the HyperCard's amazing power for audiovisual screen effects, besides its prime functional utilities, served as an additional feature encouraging the researcher to develop a convivial and novel user interface in the proposed subject area, quite different from that of the existing conventional library catalogue systems, which are often reported to be too technical and unhelpful for a novice user.

The third and the most significant ingredient to be incorporated into the design process involved the semantic organization of the database, with which the users ultimately have to interact. An important implication which the researcher felt necessary at this stage was that information in and about the database must be provided to support all the relevant user search strategies, processing and retrieval capabilities.

It has been reported in the literature that some fiction collections
have been arranged by an alternative approach, i.e. broadly by 'genre'. This has been in practice in a few selective libraries for nearly a century, though not very widely and popularly adopted. However, such an attempt needs to be appreciated as the first step along the way of subject grouping of fiction collection and represents an attempt towards shelf arrangement of fiction collection by content.

An attempt of this kind of grouping of fiction collection by content by the researcher emphasised the need to employ uniform criteria on the characterization of both the categories - users' needs and content description of the document. Hence, each search by the user must, involve one feature of the documents' contents in order to retrieve the associated set of documents. In this way, the researcher tried and built a link between the already empirically recognised pattern of users' search strategies and the characteristics of the proposed 'Sports Database'.

In the analysis and representation of the above, a new approach had been attempted. The traditional classification schemes like Dewey Decimal Classification and Universal Decimal Classification and few major secondary sources (2) covering fiction publications were referred to
for their approaches to grouping and terminology usage in the fiction organization. After a thorough scrutiny of all these sources and a prolonged discussion with the supervisors, a newly devised fiction grouping, consisting of coordinate classes, which are not mutually exclusive, was prepared. Nevertheless, exclusivity being frequently assumed when fiction are organised by genre, one cannot be retrieved by another characteristic feature. The fiction classification thus resulted in a kind which does not include the conventional logical or hierarchal order in establishing the fiction classes at any of the following four subject access situation in the Fiction World: Fiction Main Menu, Sports Fiction Main Menu, Fiction Features and its respective pulldown menu.

The Fiction Main Menu included the twenty types of fiction categories, which the researcher considered to be very popular amongst the fiction reading group. The Sports Fiction Main Menu screen lists twenty sports, considered to be of possible sporting backgrounds for a fiction document. It branches out under two broad subject headings, viz., Indoor and Outdoor Sports. Under each of these two are listed ten specific sports, with a total of twenty specific sports fiction categories. Those sports under the heading ‘Outdoor Sports’, include a further list of sub-sports as the case may be. However, for reasons of clarity and spatial organization, each one of
them is presented in different screens respectively. For example, under the heading 'Ball Games' are listed items like American Football, Baseball, Cricket etc.

The experimental database being developed on a selective basis, the researcher includes the five chosen sporting backgrounds only. Hence, these sports were analyzed in depth to identify the exclusive features reflecting the 'aboutness' of the documents, to enable the researcher to build the most appropriate search terms for those items within a database. This resulted in the identification of a few elements found common to all the categories of fiction. This include: GENRE, TIME, and PLACE. A number of other features were identified exclusive of each sport, as the case may be. They are as given below:

- LEVEL, INDIVIDUAL, TEAM and COMPETITION -
  - American Football, Baseball and Horse Racing;
  - TEAM and INDIVIDUAL - Mountaineering;
  - TYPE OF ANIMALS - Hunting.

Each of these fiction features were analyzed further for more specific features which could be used as the possible ultimate index terms matching the users' search with that of the characteristics of the
Such a deliberate provision of feature headings accomplishes the aim to reveal the users' various search strategies and task functions, which the user intermediary encounter in the daily routine. For example, if an user initiates the search for a fiction set during the time span of '1800 to 1900', the intermediate (task function) tries to match the same exactly and displays the particular record or set of records within the search request. This kind of an interaction enables the user and the system acting as a type of intermediary to play different roles.

The final step in the semantic organization was the development of the database for its structural format and the content. As mentioned in the preceding chapter, a careful scanning of the varied secondary sources (2) was carried out to select the requisite items as per the defined scope. Being an experimental database, the number of items selected were limited to a total of one hundred items. Each selected document was then recorded in a slip for its bibliographic description, which included the author/s name/s, full title, and imprint. A brief indicative summary of the content of each document was prepared, either depending on the secondary sources or, as in few cases, by reading the original fiction itself depending on its availability. Finally, each of these
items was transferred from print format to machine readable format in the predefined screen format, resembling that of a traditional catalogue card picture. This was a deliberate choice of the researcher assuming to maintain the identity of the traditional form and also for easy recognition by the users. This particular format was chosen to be copied from one of the readmade background pictures made available in the HyperCard's Background Art Stack. For convenience, this database was maintained in a separate stack, however forming part of the whole structure. Lastly, mention should be made of the inclusion of the string of fiction feature headings of each item (arranged in the same sequential order as presented in the subject access screen) in its respective bibliographic record. This provision besides assuring the user the right linkage established between search terms and the characteristic feature/s of a given record in the processing and retrieval process, also relates the other fiction features of that document, which perhaps might help the user to decide in the choice of that document to be retrieved.

After semantic organization, the physical mapping between these elements of the design was begun. This was found to be the most crucial stage consuming quite a long duration of the project period. This was perhaps because the work at this stage contributed to an integrated
interface system. More care was taken to try for the most appropriate and flexible mapping.

The basic approach was that of a cognitive task analysis, underlying conceptual representations and functional linking, corresponding to a multi-level problem domain under study. The problem domain being complex, efforts were directed towards a helpful mapping resulting in a simple and easy navigation for the novice user on his/her own within the given situation. This was possible with HyperCard's scripting potential and was made more interesting with its facility for using graphic icons to represent a command for an operation or the content of a document. This shaped the structural format and the functioning of the information processing and retrieval. Hence, the next phase of work was the identification, selection and usage of icons for different purposes.

Rohr in a series of papers has worked towards gaining an understanding of the role of visual concepts in user interfaces (3). In particular, she has raised three questions which are as stated below:

---can visual symbols better impart knowledge about complex system structures than verbal descriptions?
---can visual symbols reduce memory workload? and
---can abstract concepts be at all represented visually?

Regarding the first issue, there is evidence that system structures represented as visuo-spatial patterns ease mental navigation. According to Rohr, both the other two issues are true. These views support the idea of incorporating visual effect, if possible, to enhance the retrieval capability of a novice user. And also any approach to reduce complexity and promote user-friendly operational system is the need of the hour.

HyperCard with its audio-visual effects was found to be helpful in this situation. Its illustrative readymade stacks were available for immediate application. The specific ones which were utilised in this project include the following stacks: Background Art; Art Bits; Readymade Buttons and Fields and also few other model demonstrative stacks. The chosen icons, buttons and fields were copied and pasted at appropriate places in the working stacks of the Fiction World. The chief advantages of this duplicating process were twofold: The first one include the timesaving element in terms of not only avoiding the creation of new ones, but also because of the feature that along with the copied buttons and fields, the respective scripts were copied; and the second but most
significant advantage was the uniformity factor, as the icons used in this way maintain the standardisation of its format and functions suitable for any database regardless of the context. However, in situations where such exploitation was not possible, new icons were created with necessary scripting to activate the function needed in a particular situation. In this way, two types of icons were used in this Fiction World, viz., COMMAND ICONS and CONTENT ICONS.

A command icon is a graphical object on the display screen, which if selected, result in the execution of a given operation connected with the task function. The command icons are generally domain independent, and are signs indicating action alternatives during an interaction with the system. Hence, for the use of these icons, the users are expected to link iconic features with a particular command and select the appropriate icon out of the given set on the display screen. These command icons are deliberately spread all over the interface uniformly and in the same positions and with same functions to perform. They give easier identification and interpretation by novice users for flexible navigation within the stacks, from one point to another in a preferred direction. Besides the navigation facility, such meaningful 'iconised' mobility was assumed to enhance the interest, memory, and
skill of the novice users’ search and retrieval capability.

A content icon is also a graphical object on the display screen, which denotes a specific subject content of a document represented in the database. These tailor-made symbols are domain dependent in that current context. Each content icon on display assists the user to associate it with the contents of that document. These icons are particularly helpful in using it on the ‘front cover design’ as it provides the users with an overall impression of its contents. The same style seem to have been adopted in the systems developed by Benest et al at Department of Computer Science, York University (4). In this instance, they reflect instantly the fiction theme and story. Selection of any of these icons also display the related screens with specific and additional details exclusive to that sporting background. Due to the limited time factor, usage of content icons were confined only to those five preselected sport items included in the sports fiction database. However, apart from these specific five sport icons, a general graphic icon of an athlete carrying a torch was the only other content icon used to represent the whole of the sports fiction database. Hence, a total of six content icons were employed in the whole of the interface structure. However, in a similar way, the rest of the sports items, fiction categories (Fiction Main
Menu and Sports Fiction Menu), and perhaps also the subject access screens of each sporting fiction (Fiction features - Genre, Time, Place etc.) could all be 'iconised' on expansion of the database.

At this stage of the design process, various sports based documents, magazines and newspapers were searched to select the right graphic picture of the items under consideration. Fortunately, it was the period when the Olympic Games at Barcelona was resulting in wide mass media coverage. Finally, the six graphic pictures (one general and five specific sports) were selected for inclusion. They were scanned using the 'Hyper Scan' facility of the HyperCard at the Macintosh Laboratory in the Department. Adjustments were made for the required size and brightness of the picture and then the final scans were copied into another file, from which they were transferred finally into the respective stacks.

On completion of the visual effect of the interface structure, the researcher proceeded with the next step towards the incorporation of audio effects into the design under progress. The researcher decided to include the 'sound effect' for two prime reasons. Firstly, to exploit the software's offer of facility to do the same; and secondly, it was felt that it
can serve as an additional feature to enhance the physical presentation of the interface. To this end, the task was rather challenging, as it was not easy to capture the required sound effects. Many attempts, such as recording the sound played during televised sports programmes and broadcasting of radio programmes were all a failure. The results of these were found to be affected with lots of other unwanted noises. It was also found difficult to edit the same to suit the purpose. After a prolonged campaign in pursuit of the sound effect, finally the researcher was directed to contact the English and Drama Department of the same University. That provided to be fruitful, as the stage technician, an expert on the sound effects for stage plays, had a good collection of sound tracks in varied forms like CDs, gramophone records and cassettes. With the assistance of the technician, after a careful analysis of the sound tracks associated with the five specific sports under study, the selected sound items were recorded into an ordinary audio cassette.

At the Department's Macintosh Laboratory, using 'Audio Stack' of HyperCard, which facilitates recording and storing sound in machine language, the transfer process was carried out. The cassette was then played on a tape recorder linked to the Apple Macintosh. The result was not a satisfactory one. Hence the operation was repeated several times
to capture the right and clear sound effect. Yet it was not satisfying and so finally the cassette was played and the sound was captured via the Microphone, which was linked to the computer. This attempt had a better result and so the same was saved in the form of separate buttons which carry their own in-built script to activate them. Thus, there were five sound buttons associated with their respective sound effects created to be used in the Fiction World. They were copied into another file in a separate floppy as the sound buttons occupy enormous space, say for 5 minutes ‘play sound’ button the space taken is not less than 120 K. There was initially some technical problems in transferring the sound effects, which, however, were overcome subsequently. With the incorporation of the sound effect, the major part of the design process was towards near completion. Finally, the necessary minor adjustments and alterations were carried out to complete the design task.

In the subsequent pages of this chapter, the actual navigation within the fiction world is described supplemented with essential screen prints.

The user as he/she enters the ‘Fiction World’ encounters with the Fiction Main Menu (Figure 1). Selection of one of those fiction categories,
Figure 1 - Fiction Main Menu

Figure 2 - Apology Note

PLEASE NOTE
THIS BEING AN EXPERIMENTAL DATABASE, DESIGNED TO BE A PROTOTYPE MODEL FOR BETTER ACCESS TO FICTION COLLECTION IN ANY LIBRARY. INCLUDES EXCLUSIVELY ITEMS ON SPORTS FICTION ONLY FOR THE SAID PURPOSE.

KINDLY GET BACK TO THE MAIN MENU BY CLICKING THE ARROW BUTTON DOWN HERE AND CHOOSE ONLY "SPORTS FICTION" TO CONTINUE IN USING THIS FICTION WORLD.
Figure 3 - Access Points to Fiction World

Figure 4 - Author Index
Figure 5 - Author Index on Selection

Figure 6 - Cover Page of a Document
except Sports Fiction, leads the user to an apology note for exclusion of those items and an instruction to choose only Sport Fiction (Figure 2). However, clicking the 'Return Arrow' button on that screen brings the user back to the Fiction Main Menu screen. The choice of Sports Fiction leads to the next screen which provides three access options, all in iconic forms - Author, Title and Subject (Figure 3). On selection of one of these options, for example, 'Author' and clicking the same leads him/her to Author Index screen (Figure 4). There the user has to choose either any letter between A - Z to proceed further or enter one of the other two access screens directly choosing the respective iconic button. The user is also left with the choice to return to the Fiction Main Menu. However, this option is more suitable only in the case of a large database including items on all categories of fiction, which is not the case in this prototype system. If continuing, on clicking one of the selected letter results in a small pop up screen listing the authors' name commencing with that chosen letter (Figure 5). Further, any one of the authors of that displayed authors' list can be selected which takes the user to the document's front cover page (Figure 6). The front cover page carries the pictorial symbol reflecting the content of the document along with the full title followed by the author's name. It can be seen from the figure 6 that this screen contains a few additional buttons. That includes chiefly
**Figure 7** - Cover Page on Selection of 'OTHER TITLES'

**Figure 8** - Author-Title List on Selection of 'MORE AUTHOR'
two buttons *viz.*, 'Other Titles' or 'More Authors' to facilitate the browsing function. This browsing is intended to assist the user in two ways. One is to create general awareness of other works amongst the users and secondly, in the selection of item/s available in the database. The former button lists on the same screen the additional title/s by the same author either on the same sport or another sport. If on another sport, this is indicated verbally against the title in contrast to those items within the same sport. If there are any item/s already included in this experimental database that item/s is/are referred to as 'SEE ALSO', enabling the user to retrieve that record too if interested; and if none by that author it is marked as 'NIL' (Figure 7). The other button 'More Authors', when clicked takes the user to another screen which lists most of the documents published under different titles by different authors on that particular sport since 1950's till date (Figure 8). These two buttons allow the user to browse only those titles categorised as those falling under the particular sports under study either by the same author or other authors. Thus the system provides the user with a kind of 'Reading List' in their selection. The 'Status Box' found at the right side of the cover page screen displays the number of items available in the database under that chosen author in the database. If there happens to be more than one document, the same can be browsed by clicking the
Figure 9 - Sports Fiction Main Menu
Figure 10 A - Sports Fiction Sub-Menu - ANIMAL SPORTS

Figure 10 B - Sports Fiction Sub-Menu - BALLGAMES
‘Backward Arrow’ button. The ‘Record’ button enables the user to reach the respective bibliographic record for further more details of the document (Figure 16). Similar process is maintained for those users opting for ‘Title’ search, displaying the same set of screens.

The other option, ‘Subject’ access is represented as an iconic button, which leads the user to Sports Fiction Main Menu (Figure 9). It provides the users with a wider choice for works of fiction dealing with any one of those sporting background. Care was taken to provide an exhaustive list of all those items falling under the umbrella sports and games. To this end, the designer consulted the traditional classification schemes like Dewey Decimal Classification and Universal Decimal Classification, in addition to many sports related documents. Except for the five chosen sports for the design purpose, the rest of the sports heading are left open, to be appended later as and when enlarged, in the similar way this prototype is built.

Choosing either of the broad sports headings, ANIMAL SPORTS or BALL GAMES leads to a classification in another sub-menu with a list of specific sports headings under the particular sport (Figure 10 A and Figure 10 B respectively). Amongst those items listed in that screen, only
<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>AND SOME IN HORSES</td>
<td>JOHN KEITH STANFORD</td>
</tr>
<tr>
<td>BRILLIANT SEASON</td>
<td>NAT GOULD</td>
</tr>
<tr>
<td>CAT-NAPPERS: A JEEVES AND BERTIE STORY</td>
<td>P G WODEHOUSE</td>
</tr>
<tr>
<td>DEATH AT THE FURLONG POST</td>
<td>CHARLES DRUMMOND</td>
</tr>
<tr>
<td>DEATH OF A RACE HORSE</td>
<td>JOHN CREASEY</td>
</tr>
<tr>
<td>FAIR BROTHERS</td>
<td>DON M MANKIEWICZ</td>
</tr>
</tbody>
</table>

Figure 11 - Author-Title List on selection of 'AUTHOR-TITLE INDEX'

Figure 12 - Fiction Features - HORSE RACING, AMERICAN FOOTBALL, & BASEBALL
HORSE RACING and HUNTING (under Animal Sports) and AMERICAN FOOTBALL and BASEBALL (under Ball Games) are functional. And the fifth sport heading which is functional is MOUNTAINEERING. This sport, being an independent sport by itself, takes the users directly to the related Fiction Features screen to proceed further.

It needs to be stated here that only these five sport headings are represented with the associated pictorial icons, and the rest of them either in the Sports Fiction Main Menu or the respective sub-menu are left as verbal representation due to limited time factor. However, these items could be similarly presented in a full fledged design process.

To proceed further, clicking on one of these five sports in their respective screen, presents the user with the audio effect associated with a particular sport followed by the 'fiction features' screen. That screen presents two options. One is the provision or the user to reach the database via the author-title list appended to each sport under study. The 'Author - Title Index' button, which on selection, displays a list of those items under a sport being included in the database (Figure 11). Hence clicking any one of those lines in that displayed 'Index' takes the user to that specific record in the database for full details. And the
Figure 13 - Fiction Features - MOUNTAINEERING

Figure 14 - Fiction Features - HUNTING
Figure 15 - Fiction Features with Pulled-down Menu Listing Index

Terms

WALLACE, Francis.


GENERAL; 1960s; PHILADELPHIA; EAGLES; COACH NATIONAL; ORANGE BOWL.

A COACH ATTACHED TO PHILADELPHIA EAGLES TRAINING ITS MEMBERS TO PLAY AND TO LEAD TOWARDS THE ORANGE BOWL IN 1969- '70 TRIES TO RID THE FOOTBALL PROGRAM AT HIS ALMAMETER OF THE STIGMA OF MASSIVE RULES VIOLATIONS.
second is the provision to proceed with the subject search to reach the
database.

Each fiction features screen displays a set of broad search terms,
reflecting the features exclusive of each type of the sport fiction category.
That includes: 'GENRE, TIME, PLACE, TEAM, INDIVIDUAL AND
COMPETITION' in the cases of Baseball, American Football and Horse
Racing (Figure 12); GENRE, TIME, PLACE, TEAM AND INDIVIDUAL in the
case of MOUNTAINEERING (Figure 13); and GENRE, TIME, PLACE, and TYPE
in the case of HUNTING (Figure 14). They are not identical, as they
cannot be for the reason that they differ as per the sporting features.
Hence, the irrelevant search terms are dropped and replaced by the
suitable terms for a sport. Pulling down one of these fiction feature
terms shows a popup list of sub-menu under each of the above said
respective search term (Figure 15). The sub-menu lists the index terms,
which are ultimate access points to the respective bibliographic record/s.
One can always select whichever suits him/her. It should be noted that
clicking the chosen search term hides the other 'Pulled Down Menu'
replaced now by the new popup menu opted.

Clicking one of the lines of the selected sub-menu takes the user to
Figure 17 - Help Screen
that respective record in the database for full bibliographic description including a brief summary along with the string of index terms (Figure 16). This string is provided with the intention not only to confirm the user that he has retrieved the document he has opted for, but also to reveal to the user the other significant fiction features related to that particular novel. A set of records, one or more as the case may be, will be displayed. The 'Status Box' at the bottom of each record displays to the user the number of records under the chosen index term. The user can reach a particular record within that set by clicking on the 'GO CARD' button at the top of the screen. That again displays a dialogue box, requesting the user to enter the number of that record one prefers to read leisurely again. On entering the desired record's number and clicked "OK", immediately the respective record will be displayed. The respective small sport icon at the top of the each record enables the user to 'go back' to the Fiction Features Screen, if he/she desires to do so.

The 'Help' button in every screen (Figure 17) of the interface is intended to aid the novice user with general assistance. The 'Quit' button in every screen of the interface facilitates the user to terminate the search process and to get out of the system functioning in HyperCard's environment.
The 'Backward Arrow with a Front-end Line' in every screen of the interface enables the user to come back to the Fiction Main Menu, as and when the user desires to do so. This return commences with a fresh search process within the Fiction World.

Finally it can be said that the user with the selection of either or all of these three access options (Author, Title and Subject) could possibly retrieve the required novel/s from the Fiction World, if included in the database, as per his/her need/s.

On the completion of the task, the final and most significant phase, which is the formal evaluation of the design's expected performance was undertaken. The same is described in the following chapter.
3.1. REFERENCES AND NOTES


2. This refers to the secondary sources like indexes and bibliographies and fiction catalogues etc. cited in the literature review of the preceding section.


CHAPTER FOUR

FICTION WORLD - SYSTEM EVALUATION AND CONCLUSION

This chapter emphasises the need for evaluation and continues with a detailed description of the evaluation phase of the developed interface design. The description part encompasses the purpose, scope, methodology, results of the testing of Fiction World, leading to the researcher's identification of the new components and other proposed changes to be incorporated within the framework of the tested system. The feasibility of incorporating the suggested changes are discussed here. Finally, it concludes with the long term future research activities expected of the OPAC researchers and the related implications on the information retrieval functions in library and information centres.

4.1. NEED FOR EVALUATION

Adopting IT implies implementation. And implementation involves testing and evaluation. Evaluation refers to that phase/s of the design process to measure system's performance. Testing a single system's performance is to either assess if a system accomplishes the set objectives of the design plan or to identify eventual improvements in a system. Be it single or several systems involved, the evaluation can indicate cost-effectiveness also. It is true that it is always easy to
be an author, but not a critic. A designer is blind to the flaws of his/her creation, or perhaps even biased. Hence, an objective test of the system must be an integral part of any design process (if necessary even during) on completion of the task.

This sort of evaluation becomes inevitable in the case of a prototype system, for the fact, that such a system is primarily meant to be a 'test bed'. More so, if the prototype system is user-centred, as user-friendliness ought to be measured by the users themselves. Users' reactions and comments on the system under test reflect at best a fragmented view of the system, and at worst an extremely atypical perspective. Hence, to be more productive, it becomes essential to resort to a suitable method and technique for system evaluation that will test the system's capabilities and potential users' needs. This phase will enable the designer to incorporate new or warranted modifications within the tested system.

4.2. FICTION WORLD: EVALUATION

The methodology of Fiction World evaluation encompasses purpose, scope, method/technique, results and the inferences drawn based on the testing results undertaken.
4.2.1. PURPOSE

In the light of the goal to identify eventual improvements of the system, the following two prime purposes were considered for conducting the evaluation of Fiction World:

1. To ensure compatibility and understandability of the novice user on user-system interaction (user's effort and input);
2. To measure the retrieval effectiveness in terms of display of content, speed and presentation (system's capability).

4.2.2. SCOPE

Firstly, three major sets of factors were involved in the evaluation of Fiction World, viz.: purpose; design; and functional operation. These were considered in an objective fashion. Subjective aspects, such as personal factors and individual differences in interpretation and judgement had not been considered though conceivably these could influence and affect the results.

Secondly, Fiction World being an experimental system and also the researcher being limited by time constraint, a small scale representative survey was only planned. This meant the researcher had to decide the sample size of the subjects willing to associate themselves with the test process and also the testing site as well.

On request a set of six post-graduate students of the
Department volunteered to participate in the evaluation study. Fiction World was put into test in the Macintosh Laboratory at the Department of Library and Information Studies.

4.2.3. METHODOLOGY

The evaluation was carried out at two levels. The first level concerned itself with user-system interactive capability, in the process of which the system was intended to be exposed to the user. The second level dealt with measuring the system's effectiveness and efficiency as judged by the user. To this end, two separate questionnaires, one for each level were designed. Testing schedule (Appendix 1) contains seven specific questions in connection with finding a particular novel under a given author or title or sport. This enabled the user to exercise all the three given access points to the database. These questions were also aimed simultaneously to test the graphic icons and the sound effects incorporated into the system. Evaluation schedule (Appendix 2) carried a set of questions related to the user's experience of interaction with the system and the subsequent impact upon the user. The first seven questions covered the difficulties encountered by each subject in answering those questions. It then directed towards impact study continued to enquire about the opinion about the specific features of Fiction World.
like physical features, semantic organization, speed, understanding, clarity and friendliness of Fiction World. Lastly, the ways of changing and improving the system and or new components to be added were ascertained.

Each subject was administered with Testing Schedule. Each was initially briefed about the system and was given a period of fifteen minutes to answer the given questionnaire by him/herself. At the end of the given time, the researcher approached the subject with the Evaluation Schedule. Another fifteen minutes was spent with each subject enquiring the user’s feeling and opinion of the system’s different aspects said earlier. This yielded some solid and useful data, which were recorded for later analysis. Subsequently based on the analysis, the results were synthesised for eventual identification of the new components and/or proposed changes that are possible to be incorporated within the framework of the tested system. The same is presented in the subsequent section.

4.2.4. RESULTS

The results gathered on completion of the analysis is summarised under the following headings: 1. Functionality; 2. Semantic Organization; 3. Physical Features and 4. General Comments.
A. FUNCTIONALITY

In general, subjects did not find any difficulty in answering any of the questions. Initially they took some time to get through, but later were able to proceed more quickly. The linking, retrieval and display time taken by the system on user’s initiation was felt to be acceptable. However, it needs to be said here that during the design process, the researcher ascertained from colleagues regarding this factor. Two situations where more time were suggested include: during the display of “apology note” when any of the sport fiction other than those included in the experimental database were selected; and during the display time given for each of the set of record.

Subsequently, in both the situations the time duration was increased enough to be read by the user. Another suggestion received during this informal discussion was to facilitate the user to move within the displayed set of records on selection of a particular fiction feature. The researcher was able to allow the user to travel within the set of records by adding the “GO CARD” button. The formal evaluation confirmed that both these alterations were appropriate. The major suggestion offered at the formal evaluation was to facilitate the user to interrupt the display. Perhaps it can be done and will be useful also, as it may enable the user to end a search if he/she changes his/her mind. The rest of the functional aspects of
the system did not cause any serious setback in their search process. Hence, there was no other particular comment on the functionality from the evaluators.

B. SEMANTIC ORGANIZATION

With regard to the semantic organization of the system, the following comments were gathered. Firstly, the users did not like the multi-level approach to the database. They suggested that it was too long-winded to start from the subject access button, go through the sports fiction main menu, then again the fiction features heading and ultimately select the index term. They would have preferred to enter directly the database as quickly as possible. Secondly, one or two commented that the terminology "GENRE" in the fiction features screen is "quite new and unfamiliar". Hence, they did not know to select that term for finding, example a humorous novel. Thirdly, one of the subjects said that a search for a record with combined fiction features (similar to Boolean search), for example, a humorous novel set in 1950s could be helpful. Lastly, almost all the subjects felt that the initial screen with the fiction main menu is really not needed, rather a direct approach to sports fiction would be better.

C. PHYSICAL FEATURES

Regarding the physical characteristics of the tested system, the
evaluators felt that the screen layout, display format, graphics and
iconic images were well presented. The visual effects were
appreciated, but not like the audio effect. A few commented that "it
disturbs" and "really not necessary", though one said that "it is
interesting and fun". Another suggested that the sound effect will be
"particularly beneficial for the blind user group" to capture the
content of the screen. In particular, the sound effect associated with
the sport MOUNTAINEERING was not felt instantly to be clear and
easily associated with the given sport. Regarding the typography, a
few suggested to provide the title part of the bibliographic record in
‘bold’ letters to be instantly as visible as author’s name. Also one said
that the letters A-Z in the Author and Title Indexes were too small to
be read and also to point the mouse on it to click.

D. GENERAL COMMENTS

The users were asked for their overall judgement and other
comments, if any, of the system. The responses were related to the
clarity, understandability, ease-of-use, and friendliness of the system.
In general, they seem to be happy with the system on all these
aspects. However, as said earlier, the two chief comments were
regarding the sound factor and secondly, preference for the direct
and quick access, rather than the given sequential approach to
database.
4.3. INFERENCES

The evaluation results reveal that the system in general is interesting and beneficial to novice users. The proposed changes and new elements were considered for incorporation into the system. Those identified as minor, simple and feasible changes shall be incorporated within the framework of the system and those few of them which were new components were left as such for the time being, for reasons discussed subsequently. But, these could be possibly carried over if felt necessary and given the time. The former category includes alterations in typography, elimination of sound effect, and direct entry to sports fiction screen etc. The latter category include: firstly, the replacement of the term “GENRE”, as it was felt to be a language problem. It could be replaced with the term “FORM”, but it needs to be considered further; Secondly, the sequential subject access to fiction being planned deliberately towards enhanced subject access to fiction, the proposed change for direct access does not need any modification. The users seem to be happy with the present system of simple author and/or title approaches to fiction collection, that provision for any potential enhanced access cause a serious concern for them. Habits die hard and also the ‘principle of least of effort’ always demands a simple and easier approach, rather than a complex approach, not realising the fruitful results the latter can yield.
However, a large scale evaluation of the system, especially amongst the fiction users, could really give a better picture of the situation. And even then if the same opinion is held, perhaps alternative approaches can be developed, given the time; Thirdly, interruption during the display function of the system though found useful and also feasible to be incorporated, was not tried for want of time. This change will be much appreciated as in reality, the number of records in the database and the related retrieval under a given command could be much more. This can be one of the major components to be taken up for future work analysis in the present design.

4.4. CONCLUDING REMARKS

The simplest ideas are not necessarily the easiest to implement. Enabling users to travel from one piece of information to another in a large set of information, instead of forcing them to describe the information they want to find is not simple. However, one can note that, so far, most of the applications of this idea have led only to demonstration models (with a few exceptions like "The Book House" project). In attempting to design such access systems based on navigation through a set of links, the researcher experienced difficulty in constructing these links for several reasons: 1. to identify a great number of access points and significant links; 2. difficult to represent the links; 3. difficult to establish the interrelation between the links.
exactly matching the search query and the contents of the database. However, with scripting and thanks to the supporting technologies and human visual perception, navigation has been made possible. Use of graphics has established the idea of a navigation through a set of images, which is a powerful user interface metaphor. The problem here again is the difficulty in the representation of large set of images in a single screen, which was experienced by the researcher particularly when developing one such screen for Fiction Main Menu incorporating all the fiction categories in graphic form. This spatial problem is that which the designer could not help at this stage. Another experience the researcher would like to share here is about the incorporation of the sound effect. Knowing very well that it might not directly or indirectly contribute to the functionality of the system, but attempted the facility assuming to enhance the system's effectiveness. It was found that it is really did not do so.

The implications are quite clear. The emphasis of OPAC researchers should be on building up a system based on understanding the work situations, respecting the human beings' needs and related to meaningful tasks and objectives. Such efforts could result in people and technology working together towards a people-centred approach.
A series of attempts in this direction has already begun as made clear from the literature review. It needs to be continued and strengthened to achieve a more sophisticated level of offering a system that could be appreciated by novice users. The potential of OPACs has been well appreciated and explored to see that this potential develops into positive reality. OPACs are being developed by researchers to be a means to information beyond the conventional catalogue. Library and information professionals must relinquish their traditional position at the centre of the information delivery system and adopt a new model that places the user in the centre of burgeoning expanse of information sources. New roles for both the professionals and patrons are being initiated in this age of customer service.

In concluding the project, it should be said that OPACs is a fertile ground for researchers. As experience with online catalogues grow, effective bibliographic displays will develop further. The floor is open for the OPAC researchers to play their ball. Nevertheless, sufficient devotion of time and efforts may well hit the goal.
   Roskilde, Denmark: Riso International Laboratory, 1989.

2. Ainley, Patricia. & Barry Totterdell, eds. *Alternative arrangement, new approaches to public library stock.* London:
   Association of Assistant Librarians, 1982.


19. Dumas, Joseph. *Designing user interface for software*. NJ: Prentice-


29. Hancock-Beaulieu, Micheline. Query expansion: advances in


39. Kaehler, Carol. *HyperCard power: techniques, scripts.* Reading,


60. Scharf, Meg, & Jeannette Ward. Side-by-side: users react to a


67. **Sporting fictions: proceedings of a conference.** Birmingham: Dept. of Physical Education and the Centre for Cultural Studies in the University of Birmingham, 1981.


APPENDIX-1

FICTION WORLD - TESTING SCHEDULE

Brief......

'Fiction World' is a prototype interface system designed to allow public access to an experimental database containing 100 works of fiction about sport. As part of the design process, a small scale test to study the user's response to this prototype system is undertaken. hence, kindly use the system and answer the following set of questions. THANK YOU for your kind cooperation in this regard.

QUESTIONS

1. Please note down the title of any novel by P G WODEHOUSE

2. What is the sporting background of the novel "GONE AWAY"

3. List any two titles by GWEN MOFFAT
   1.
   2.

4. List any two authors who have written novels on MOUNTAINEERING
   1.
   2.

5. How many 'HUMOROUS' novels on AMERICAN FOOTBALL can you find?

6. In which novel does a character have to choose between playing Baseball for the 'Yankees' or 'going to college'?

7. Find a PSYCHOLOGICAL novel set in 1950s AMERICA hunting MOUNTAIN LION?
APPENDIX - 2

EVALUATION SCHEDULE

1. What problems did you have in attempting any of those above set questions.

1. 

2. 

3. 

4. 

5. 

6. 

7. 

95
2. Is there a way that you would like to find a novel that this system does not allow?

3. Did you use 'HELP' button? If so, Why? Was it helpful?

4. Can you explain in your own words the functions of the following buttons.

1. OTHER TITLES:

2. MORE AUTHORS:

3. AUTHOR-TITLE INDEX:

4. ANY OTHER BUTTON:
5. Did you have any problem in understanding any of those screens displayed to you while using the system?

6. What do you think about the "SOUND" effect associated with each sport.

7. What is your overall judgment of the system?

8. Any other comment(s), please specify.