

**ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
SCHOOL OF INFORMATION STUDIES
FOR AFRICA (SISA)**

**AN ASSESSMENT OF THE EXISTING INFORMATION RETRIEVAL
PRACTICES AND FACILITIES IN THE INSTITUTE OF ETHIOPIAN
STUDIES LIBRARY WITH A VIEW TO DEVELOPING
MECHANISMS AND TOOLS FOR IMPROVEMENT**

**A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF SCIENCE IN INFORMATION SCIENCE**

By
Kula Kekeba

May, 1998

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LIBRARIES
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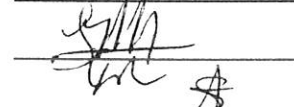
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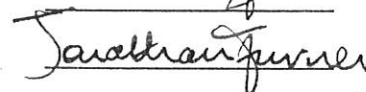
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Ato Sisay Fissaha, Advisor



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Dedication

To my father Kekeba Tune and my mother Tirunesh Yadaye.

Acknowledgement

I am grateful to Addis Ababa University and its Institute of Ethiopian Studies, my employer, for granting me two years study leave to accomplish this study. Particularly, I would like to extend my thanks to the IES library staff members who assisted me by collecting and providing the necessary data for the study.

I am grateful to my advisors, Ato Takkele Tadesse and Ato Sisay Fisseha for their constructive criticism and invaluable comments throughout this thesis. My special thanks also extend to my friends and colleagues Solomon Teferra, Kebede Hundie, Fufa Dawo and Abnet Simie for their unreserved support and co-operation throughout this study. I finally owe special thanks to my brothers and sisters for their moral support and encouragement during the study.

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Table Of Contents

| | Page |
|---------------------------------------|----------|
| Declaration..... | iii |
| Dedication..... | iv |
| Acknowledgement..... | v |
| Abstract..... | vi |
| Table of Contents..... | vii |
| List of Tables..... | xii |
| List of Abbreviation..... | xiii |
| Chapter One | |
| Introduction..... | 1 |
| 1.1. Background..... | 1 |
| 1.2. Statement of the Problem..... | 6 |
| 1.3. Justification of the Study..... | 9 |
| 1.4. Objective of the Study..... | 12 |
| 1.4.1. General Objective..... | 12 |
| 1.4.2. Specific Objectives..... | 12 |
| 1.5. Significance of the Study..... | 13 |
| 1.6. Methodology..... | 14 |
| 1.6.1 Data Collection Techniques..... | 15 |
| 1.6.1.1. Questionnaire..... | 15 |
| 1.6.1.2. Interview..... | 16 |
| 1.6.1.3. Observation..... | 16 |
| 1.6.1.4. Document Analysis..... | 16 |

| | |
|-----------------------------------------------------|----|
| 1.6.2. Sample Design..... | 17 |
| 1.6.2.1. End Users..... | 17 |
| 1.6.2.2. Library Staff Members..... | 17 |
| 1.6.3. Data Analysis and Prototype Development..... | 17 |
| 1.7. Scope And Limitation Of The Study..... | 18 |
| 1.8. Organization Of The Thesis..... | 20 |

Chapter Two

Information Storage and Retrieval System

| | |
|--------------------------------------------------------------------------|-----------|
| and Its Evaluation Studies..... | 21 |
| 2.1. Information Storage and Retrieval System..... | 21 |
| 2.1.1. Historical Developments of IR System..... | 21 |
| 2.1.2. Components and Functions of IR Systems..... | 23 |
| 2.1.2.1. Description and Indexing..... | 25 |
| 2.1.2.2. Storage..... | 27 |
| 2.1.2.3. Searching..... | 27 |
| 2.1.3. IR Mechanisms and Tools: The Concept of Subject Approach | 29 |
| 2.1.3.1. An Overview of Subject Approach to Information..... | 29 |
| 2.1.3.2. Classification Schemes and the Subject Approach | 31 |
| 2.1.3.3. Alphabetical Subject Approach..... | 32 |
| 2.1.4. Computerized IR Tools and Facilities..... | 35 |
| 2.1.4.1. Computerized Catalog..... | 35 |
| 2.1.4.2. Micro-CDS/ISIS Software..... | 37 |
| 2.2. Evaluation of IR System..... | 39 |
| 2.2.1. Evolution of IR Evaluation Studies..... | 40 |
| 2.2.2. Review of Related Studies..... | 42 |

| | |
|-------------------------------------------------------------------|----|
| 2.2.3. Methods of IR Evaluation: The User Oriented Approach | 44 |
| 2.2.4. Criteria of IR System Evaluation..... | 46 |

Chapter Three

| | |
|-------------------------------------------------------------------------------------------------------|-----------|
| The Institute of Ethiopian Studies Library..... | 51 |
| 3.1. Background: The Institute of Ethiopian Studies..... | 51 |
| 3.1.1. An Overview of the IES Foundation..... | 51 |
| 3.2.1. Establishment, Organization and Objectives of the Institute of Ethiopian Studies (IES)..... | 52 |
| 3.2. The Institute of Ethiopian Studies (IES) Library | 54 |
| 3.2.1. Development and Objective of the IES Library..... | 54 |
| 3.2.2. Functional Structures, Resources and Users of the Library | 56 |
| 3.2.3. An Overview of IR Tools and Facilities Used at the IES Library..... | 58 |
| 3.2.4. A Brief Review of Studies Related to the IES Library and Its Information Services..... | 60 |

Chapter Four

| | |
|---------------------------------------------------------------------------------------------------|-----------|
| Data Analysis and Discussion..... | 62 |
| 4.1 Data Presentation and Analysis..... | 63 |
| 4.1.1. Assessments of the Manual IR Practices and Facilities of the Library..... | 64 |
| 4.1.1.1. Major IR Practices, Tools and Facilities of the Library: Usage and Accessibility..... | 65 |
| 4.1.1.2. Accessibility of the Current Collection of the Library | 70 |
| 4.1.1.3. Effectiveness, Efficiency and Adequacy of the IR Tools/Facilities..... | 71 |

| | |
|----------------------------------------------------------|----|
| 4.1.1.4. Frequencies of and Factors for IR | |
| Success/Failures of the users..... | 75 |
| 4.1.1.5. Constraints and/or Limitations of the | |
| Existing IR Tools/Facilities..... | 76 |
| 4.1.1.6. Satisfaction of users with the Existing IR | |
| Tools/Facilities..... | 77 |
| 4.1.2. The Computer-Based Catalog Database..... | 79 |
| 4.2. Discussion and Implications of the Findings | 83 |
| 4.2.1. Discussion..... | 83 |
| 4.2.1.1. Existing IR Practices and Facilities of the | |
| Library: Nature, Usage and Accessibility..... | 84 |
| 4.2.1.2. Effectiveness, Adequacy and Efficiency of the | |
| IR Tools/Facilities..... | 88 |
| 4.2.1.3. Limitations of the Existing IR Tools/Facilities | |
| and Sources of IR Failures or Dissatisfaction..... | 91 |
| 4.2.2.2. Summaries and Implications of the Findings..... | 93 |

Chapter Five

The Proposed IR Tool: A Prototype Computer-*Assisted*

| | |
|----------------------------------------------------------------|-----------|
| Thesaurus <i>Assisted</i> Database..... | 96 |
| 5.1 The Role of Thesaurus in IR System..... | 96 |
| 5.2. Planning and Designing of the Thesaurus Construction..... | 98 |
| 5.2.1. Definition of the Subject Field..... | 98 |
| 5.2.2. Decision about Thesaurus Characteristics Layout..... | 99 |
| 5.2.3. Decision about the General Approach to be Used..... | 100 |

| | |
|-----------------------------------------------------------------------------------------------|-----|
| 5.2.4. Techniques and Procedure Used for Collection, Selection and Structure of Terms..... | 101 |
| 5.3. Thesaurus Database..... | 103 |
| 5.4. Maintenance and Development of the Thesaurus..... | 106 |
| 5.6. Operational Significance and Use of the Thesaurus Database..... | 107 |
| 5.5. Checking with the Subject Experts and Informal Testing of The Thesaurus Database..... | 107 |

Chapter Six

| | |
|---------------------------------------------|------------|
| Conclusions and Recommendations..... | 108 |
| 6.1. Conclusions..... | 108 |
| 6.2. Recommendations..... | 109 |
| References..... | 112 |
| Appendix I: Users Questionnaire..... | 118 |
| Appendix II: Discussion Guides..... | 124 |
| Appendix III: List of the Interviewees..... | 128 |

List of Tables

| | Page |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Table 3.1. Departmental and Linguistic Distribution of the Library Collections... | 57 |
| Table 3.2. The Library Staff..... | 57 |
| Table 4.1. Distribution and Responses of Users Questionnaires..... | 63 |
| Table 4.2. Major Procedures/steps that are Commonly Involved in Document Classification, Cataloging and Searching in the IES Library..... | 67 |
| Table 4.3. Frequency of the Library Usage..... | 68 |
| Table 4.4. Usage Frequency of the Library IR Tools/Facilities..... | 68 |
| Table 4.5. Accessibility Rate of the Library IR Tools/Facilities..... | 69 |
| Table 4.6. Effectiveness of the IR Tools/Facilities..... | 71 |
| Table 4.7. Usefulness Rate of the Card Catalogs Access Points or Entries..... | 72 |
| Table 4.8. Users General Judgment of the Library Card Catalogs IR Facilities..... | 73 |
| Table 4.9. Estimated Average Time Spent to Identify a Single Requires Document Using the Library Card Catalogs and the Feelings of Users about the Time Taken in Searching..... | 74 |
| Table 4.10. Reasons for Spending too Much Time and Efforts in Searching Required Items in the Library Card Catalogs..... | 74 |
| Table 4.11. Retrieval Ease Rate of Various Types of Library Collections..... | 75 |
| Table 4.12 Frequency of Users Capability to Identify and Locate the Required Library Resources independently..... | 75 |
| Table 4.13 Problems Frequently Encountered By Users in IR..... | 77 |
| Table 4.14 Degrees of Users Satisfaction with the Existing IR Facilities..... | 78 |
| Table 4.15 Additional IR Services/Facilities Recommended..... | 79 |

LIST OF ABBREVIATIONS

AACR2 - Anglo-American Cataloging Rule, Second Edition

AAU - Addis Ababa University

DDC - Dewey Decimal Classification

IES - Institute of Ethiopian Studies

IR - Information Retrieval

IT - Information Technology

LCSH - Library of Congress Subject Headings

OPAC - On-line Public Access Catalog

R & D - Research and Development

SDI - Selective Dissemination of Information

SLSH - Sears List of Subject Headings

UCCAA - University College of Addis Ababa

UOE - User Oriented Evaluation

Abstract

The Institute of Ethiopian Studies (IES) library is one of the major information center on Ethiopian Studies. This thesis is mainly concerned with an assessment of the existing IR practices and facilities in the IES library with the intention of identifying limitations and exploring alternative tools and mechanisms for improvement. To this end, a survey of the library users and staff members was made and the current performance of the library IR tools and facilities are assessed and discussed in detail.

After identification of various limitations of the current library IR practices and facilities, a prototype computer-assisted thesaurus database was proposed and demonstrated as one of IR tools and mechanisms that can be employed for improvement. Moreover, based on the findings of the study, conclusions and recommendations are given for further investigation and improvement of the library IR services.

CHAPTER ONE

INTRODUCTION

1.1. Background

Nowadays with the rapidly advancing and widely expanding research and development (R & D) activities, the number of pertinent research outputs have been dramatically increasing. Similarly it has become increasingly worthwhile, yet challenging, for both information centers and their users to access, retrieve and use relevant documents from these steadily growing treasures of information sources. Relevant information known to be available in library or information center may go unused in research and development because of information overload or ineffectiveness of its access mechanism. Consequently, efficient and effective methods or tools are required for representing, organizing and accessing information that can match and cope up with the increasing needs of users. Hence, the need for development of various information retrieval (IR) mechanisms and tools for provision of timely, relevant and accurate information to the user(s) has become a major factor in libraries/information systems.

Regarding this, Brown (1982:2-3) states that no matter how large the collection, a library is of little value if it is unable to retrieve the right documents as and when they are required. Indeed, the principal function of any library is to make the information sources it contains available to the library users at their request. In order to fulfill this function, the information that is stored in the library must be recovered, or retrieved, from the store. To do this it must develop and maintain certain tools and mechanisms of information retrieval (IR). Illustrating this fact Van Rijsbergen (1979) states that with the advancement of research and development, the current capabilities for producing (or generating) information far exceed the amount of information that can be organized and retrieved

efficiently. Due to the availability of a vast amount of information to which accurate and fast access is becoming ever more difficult, a continuous and regular assessment and improvement of the existing IR system of a library is becoming increasingly very important and absolutely essential. Since information is a key resource whose absence or lack is often costly, we need to build a system that makes it available at the right place, at the right time, in the right form, to the right user.

An information storage and retrieval system, which is usually referred to as 'IR', can be defined as an information system used to store items of information that need to be processed, searched, retrieved and disseminated to various user populations. In particular, an IR system is necessary for the choice of an efficient organization and storage of documents (records), for rapid search procedures capable of finding items of interest in specific cases, and effective methods for disseminating the retrieved data and interacting with the system user (Salton and McGill, 1983:xi). Gilchrist (1996) preferred the term 'computer assisted bibliographic reference retrieval' for the sense of using computers to store and retrieve only bibliographic information. However, considering the fast development of information technology and its application in IR, Gilchrist further pointed out that today IR includes surrogates, texts and full document retrieval, together with pictures and images.

Accordingly, IR is concerned with the representation, storage, organization and the accessing of information sources and their bibliographic information (document surrogates) acquired in libraries or information centers. It is mainly aimed at facilitating access and retrieval of information for utilization of knowledge that has been recorded and exists in various formats and sources. "An effective information system stores a large number of records and yet retrieves the desired information rapidly and accurately in response to the requests of its users" (Hayes, 1995:161).

Although nowadays the term IR has been associated with computer-based information retrieval systems, manual IR systems such as classification, cataloging, indexing and abstracting are still evident in various libraries and information centers. These conventional IR mechanisms have been used for a long period of time for the organization of documents and their bibliographic information (document surrogates) to enable the users identify required items on specific topics of interest (Rowley, 1992:7). Broadly the IR system is any method of organizing and getting access to information contained within any kind of information system or to sources such as manual printed indexes, card catalogs or computerized online searching system (Bawden, 1990:114).

As it was noted by Cooper, Martin and Parker, cited by Solomon (1997:45), the need for an evaluation of IR system had arisen due to the fact that clever design modifications and developments had been required and proposed which might substantially improve the existing systems retrieval performances. The assessment of the existing system is necessary if the system is to stay viable and if the development process to be useful for a later improved version of the system. A regular evaluation is, therefore, the basis for a good performance and improvement of an IR, as any other system. We need a regular and formal assessment to design, develop and maintain an effective IR system that can cope up with the rapidly growing users and technological requirements.

The term 'assessment' is defined by various English dictionaries as the act of judging the quality, or the instance of determining or evaluating the importance or value of something. Accordingly, an assessment can be considered as a process of estimating or as a means of evaluating the value of a given system or object. With this understanding, this study is mainly aimed at assessing the existing IR practices and facilities of the library of the Institute of Ethiopian Studies (IES) with a view to developing improved access and retrieval tools based on its user requirements.

The IES library was set up in 1963, with the establishment of the parent Institute - the IES. Since then, the library has been serving the Institute and its researchers on Ethiopian Studies through the provision of information services. Currently, it is one of the major library/information centers that promotes and supports research and developments related to Ethiopian Studies. There are various subjects covered in Ethiopian Studies, the major four core disciplines being Ethiopian history, languages, social anthropology and sociology. Most of the library users usually come from these four departments of the Addis Ababa University (AAU) though researchers outside the University community are also part of the library users.

As any academic and research information center, the library has seriously been acquiring all documents related to Ethiopian Studies. Currently, it has about 115,500 volumes of collections, which are in various formats and languages. The IES library is one of the richest libraries on Ethiopian Studies. "It is reputed to house one of the finest collections of works on ancient, medieval and contemporary Ethiopian Society" (Endashaw, 1995:7).

However, no matter how great and rich the library resources are, they are of little or no value unless the documents are duly accessed and used for further research and development. Elaborating this fact, Fugman (1993:1) states that the mere existence of all types of documents or records in libraries and archives is by no means sufficient. Rather, the information stored must be retrieved and made accessible from all the stores whenever they are needed. It is the task of an information system to provide the desired information at a tolerable expenditure of time and human search efforts to all users.

Clearly, to make the existing library resources timely and easily accessible, the improvement and development of IR tools and mechanisms are very essential. Despite this fact, as it has been discovered through a preliminary investigation, the IR tools and mechanisms that had been employed and practiced at IES library over the last three

decades have remained basically manual and virtually unchanged. Currently, the existing conventional classification, cataloging/indexing and searching practices and facilities of the library seem to fail to meet users' timely information access and retrieval requirements. Even though a computer-based, in-house catalog database called 'FORCLN' was recently launched in the library, as a preliminary survey indicates, the database is not fully developed yet. It also fails to alleviate most of the existing conventional information storage and access problems. In short it does not cope up with the rapidly growing IR requirements of the library staff and users.

Indeed, the IES library information accessing mechanisms and searching facilities have remained predominantly very conventional or traditional and system oriented. To access the library resources, the user has to adapt himself to the existing retrieval tools but is given little guidance in the IR process. As evidenced by Abebe (1993) and in what is practically observed in the IES library IR system, various problems are seriously hampering the library services. Due to the lack of standard and appropriate subject guides (or vocabulary control devices) the library has not yet prepared (alphabetical) subject catalogs to meet the IR requirements of its users who prefer to search by the topics of their research problems.

An alternative improved IR mechanisms and tools are therefore, required to be designed and developed to facilitate the performance of the existing library IR tools and facilities. The development of controlled vocabulary devices such as thesauri, which may play a great role and effectively serve both the library users (searchers) and catalogers (indexers) can minimize most of the incompatibilities or mismatches that occur between the users searching approaches and the library IR practices and facilities. Moreover, such controlled vocabulary devices or tools could avoid or minimize the time consuming searching practices and IR failures of the users by providing them with specific and

relevant subject headings that have been used in cataloging and indexing. Thus, it enhances access and retrieval of the library resources.

Although different researches that have been undertaken on the IES and its library services have indicated certain limitations of the existing IR facilities in general terms, none of them have adequately addressed and assessed the existing information access problems and possible alternative tools to improve the existing IR system. Among the researchers Abebe (1993:65) has indicated that the lack of subject access points and impreciseness of bibliographic information provided in the library catalogs are the major causes for the dissatisfaction of the users. Likewise, Azene (1996) also states that identifying and locating required items in the library is highly challenging, as it requires lots of time and effort from both the library staff and users. Nevertheless, there has been far less evaluation research on IR services of the IES library in relation to its users' needs. Taking these facts into account, the assessment of the current IR performances and their users' requirements becomes inevitable.

With this background, the statement of the problem is briefly discussed below.

1.2. Statement of the problem

As noted earlier, progresses in R & D largely depends on effective retrieval and adequate communication of information. Information systems and professionals whose job is to support R & D activities naturally want to know whether the existing IR and communication system is as efficient as it might be. The system designers and scholars want to look into whether there are certain tools or mechanisms that can be developed to make it more efficient and effective (Wilson, 1995). Indeed, satisfying the information needs of users is the major function of an information retrieval system. However, IR service providers know far less about users, user needs and relationships with information

than they do about the more technical, internal aspects of index languages and retrieval systems (Turner, 1987:7). Stressing this problem, Janes (1994) also states that without a reasonable notion of what users want from information systems, it is difficult to make a decision about what system to design and what they expect to get out of the system. The development and employment of an efficient IR system that is based on its user requirements is becoming indispensable for effective exploitation and utilization of the existing library/information resources.

However, the designing and establishment of such IR system is very difficult without a detailed investigation of the existing systems and assessments of its users' requirements. The user approaches and preferences for searching or retrieval of required information should be the focus of designing and development of an IR system. Considering the problems that users face in IR, Solomon (1993) states that an IR system often seems to be designed for some imaginary faceless, prototypical users. Then the users are facing the challenge of IR. Some of the users become lost and stop their quest for information. The challenge is to understand why some users succeed and others fail in order to develop flexible, anticipatory mechanisms to support users as they explore information sources to retrieve the required information item.

By the same token, Hersh (1994) also states that an IR system must be easy to use, helpful in constructing or formulating queries and be able to steer the users to the types of document they need. The system also has to contain appropriate breadth and depth of indexing language for users to obtain value from the available information sources. Accordingly, to develop a successful IR system, it is necessary to assess and determine the nature of the existing cataloging or indexing practices facilities and users' requirements for accessing or finding information.

As it was evidenced and observed in the discussion of the IES library staff meeting and its minutes (September, 1997) the existing IR practices and facilities of the library

have considerably failed and are not able to cope up the changing and increasing requirements of users. Besides the laborious and time-consuming (manual) searching practices and processes, the noise of irrelevant surrogates that have to be browsed and the inaccurate responses obtained in retrieval of required documents are becoming very common and rapidly growing.

In spite of many efforts made by the library staff to support the users and to facilitate the library IR services, their current operational capabilities (or performances) have remained to be far away from being satisfactory. Consequently, a formal assessment of the existing IR performances and the requirements of the users become very crucial to improve the library services. Obviously, the key to the success of IR depends largely on the accurate identification of what the users need. The most common approach for need assessment is simply querying and investigating the requirements of the user. User satisfaction is certainly a valid yardstick by which the effectiveness of the system can be measured and evaluated (Pao, 1989:40).

It is against this background that this research was formulated as a means of investigating the state of the current IR practices and facilities of the IES Library from the user point of view. Based on the findings of the study, an attempt is also made to explore and develop alternative mechanisms and tools for the improvement of the IR system.

In summary, this study specifically seeks explanations or answers for the following basic research questions, which guide the study.

- What are the major IR tools, procedures and activities that are practiced and used at the IES Library?
- To what extent are the existing IR tools and facilities accessible, suitable and helpful for the organization and retrieval of library resources?
- How often do the users fail or succeed in identifying and locating the documents they want?

- What are the major factors that affect the success or failure of users in IR?
- What are the access points or IR facilities that are more preferred and required by the users for searching relevant information sources in the library?
- To what extent are the users satisfied or dissatisfied with the existing IR facilities of the library? Why?
- What are the major problems that are frequently encountered and inhibit the accession and retrieval of library resources?
- What are the alternative mechanisms and tools that could be considered and developed to alleviate the problems and improve the IR system?

1.3. **Justification of the Study**

There are many reasons for assessing or evaluating existing information services, including the IR. Bawden (1990:40), Swanson (1978) and Gilchrist (1996) outline a number of possible major reasons for evaluation, which could be summarized as shown below:

1. Provision of better information organization and retrieval services; without a certain formal evaluation there could never be any clear understanding of the deficiencies of existing IR services. Thus, a regular assessment of the current IR services and their users' requirements is a means of functional justification and further improvement for the existing system.
2. Justification of the existing service; an evaluation of the existing service, including the IR, is also required to determine to what extent the system meets its established objectives and the requirements, and whether it is worthy to invest on. Evaluation is thus an important factor in monitoring or modifying the

existing system and in designing and implementing an alternative feasible new system properly, and economically.

Similarly, Pao (1989:215) and Lancaster (1988:77) have pointed out that a regular evaluation of the existing information retrieval systems is vital to determine the accountability, performance level, and the sources of the failures or weaknesses of the existing system. It is also important for the identification and development of improved alternative IR mechanisms. Furthermore, Salton and McGill (1983:158) indicate that the assessment of the existing IR system is required to compare the existing system with another alternative system and to determine how the system performance changes when a particular system component changes.

As it could be understood from the above illustrations, a regular assessment of any information system in general, and its IR in particular, is very important to determine the level of their performances. It is also important to obtain facts on how to improve the existing IR services to cope up with the increasing requirements of users and rapidly advancing information technology (IT) environments.

Although all of the five laws of library science have their own implication for information service evaluation, according to Lancaster (1988:12), Ranganathan's fifth law, i.e. 'Library Is a Growing Organism,' provides the major justification for library/information system evaluation activities. Healthy growth implies adaptation to changing conditions and adaptation implies evaluation to determine what changes need to be made and how they may best be accomplished. The library must be evaluated not only in terms of "how it is doing" but in terms of whether "it is doing what it should be doing".

Indeed, nowadays, the exploitation of the existing library resources highly depends on the effectiveness and type of devices or technology employed for the purpose of IR. Particularly, in academic and research information centers, like the IES library, where the IR mechanisms and tools are always expected to be effective for retrieval of required

information, the need for a regular investigation and assessment of the existing system is unquestionable.

To this effect, certain studies were undertaken during the last few years, though none of them have adequately investigated and assessed the IR practices and facilities of the library. Among these the following are the notable ones. Gupta (1991) made a brief survey and identified the need for improvement of the indexing and bibliographic compilation for the various collections of the library. Abebe (1993) conducted a feasibility study for developing a computerized Ethiopian Resource Center Database to support and enhance the information services offered at the IES and its library. More recently, Azene (1996) also studied the IES and its library reference services. He proposed and recommended an expert reference advisory system to improve the reference services offered at the institute.

Indeed, these studies had contributed much and may still have a considerable value for improving the existing information services at the Institute and its library. Nevertheless, none of them had adequately addressed and assessed the existing IR practices and facilities of the library in relation to IR requirements of the users so as to develop improved tools and mechanisms for information storage and retrieval. As a result, by now nothing or little is known about the performances and constraints of the existing IR practices and facilities of the library. There is no clear awareness of the requirements of users for IR and possible tools recommended for improvement.

Above all, due to some time has been elapsed since most of the studies were undertaken, a detailed examination of the current library IR services and reinvestigation of the relevancy and validity of these studies are also highly desirable. This clearly justifies the need to conduct such a research.

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1.4. Objective of the Study

1.4.1. General Objective

The general objective of the study is to assess and analyze the existing IR practices and facilities in the IES library with a view to developing mechanisms and tools for improvement.

1.4.2. Specific Objectives

To achieve the above general objective, the study has set the following specific objectives.

- To investigate the existing IR practices and facilities such as classification, cataloging and document searching procedures of the library in view of identifying limitations, if any;
- To assess and determine the adequacy, efficiency and effectiveness of the current IR facilities of the library to meet users' needs;
- To identify and analyze the causes or sources of the library users dissatisfaction with the existing IR system, if any;
- To identify the approaches and preferences of users for representing and searching required information;
- To explore the need to develop alternative mechanisms and tools for upgrading the effectiveness of the current IR system ;
- To propose and demonstrate a prototype IR tool for further development and implementation.

1.5. Significance of the Study

As it has been indicated earlier, the efficiencies and effectiveness of the IR mechanisms and tools used in a library is the key to the accessibility and retrieval of required information. However, to build such an IR system, the assessment of the existing system and its users' requirements is one of the major prerequisites. Evidencing this fact, Larson (1992) says that the concern for the needs of the users has led to numerous research studies to determine the effectiveness of the IR. The findings of the studies have in turn led to an evolutionary redesigning and enhancement of IR services by library management to meet the users' needs and remedy the observed problems in a better way.

Taking these facts into account, this study is aimed at the assessment of the existing IR practices and facilities of the IES library. An attempt is made to identify and determine the performance level of the existing IR services in general terms, based on the requirements of the users. Above all, alternative IR mechanisms and tools are explored to improve the existing IR services. Along this line, some of the specific purposes of evaluation listed by Swanson (1978) are:

1. To explore techniques for increasing system effectiveness
2. To establish the foundation for further research on the reasons of the relative success of alternative techniques.
3. To improve the means employed for attaining objectives or to redefine sub-goals or goals in view of research findings.

Similarly, it is anticipated that the results of this study will be used:

- To ascertain the performance effectiveness or functional status of the existing IR practices and facilities of the library.
- To understand and determine the gap between the existing IR services and the users requirement.

- To find a basis or an aid for further detailed investigation and evaluation of the library IR services and their improvements.
- To make aware the library management about the limitations of the existing IR system and the need for the development of improved IR mechanisms/tools that are capable of meeting users requirements.
- To serve as a springboard for future investigations of studies related to IR system thus saving the time of other researchers in the field.

In summary, such assessment of the existing IR services from the users' point of view allow the library management and staff to detect problem areas so that deficiencies may be identified and rectified and improvements made on the services provided.

1.6. Methodology

It is important to note that an evaluation research is not a single technique or even a range of techniques. On the contrary, it encompasses any and all useful research methodologies. Evaluation has to be individually designed to provide the greatest possible amount of directly useful information for decision-makers of the information system. It should also be "good enough", to deal with, and answer the practical questions being addressed, rather than necessarily being 'the best' in terms of methodology (Bawden, 1990:22). Robertson and Hancock-Beaulieu (1992) have also pointed out that the development of more effective IR mechanisms is dependent on the development of effective methods of evaluation. Illustrating the advantages of this approach for information system evaluation, Bawden (1990:7) further states that a user-oriented evaluation gives full weight to the actual and practical value of a system or service, within its everyday context, taking into account fully and explicitly the value of information provided to the users, and including in the analysis of all the relevant factors. It is

therefore an approach to deal adequately with the true situation of the existing system, and the requirements of its users. Taking this into account, user-oriented evaluation is the preferred and employed approach in this study.

Revealing the role of the information needs of the user in the IR services, Pao (1989:40) pointed out that the information requirements of the user is of central concern to providers of the information service. The ultimate aim of any IR is to supply and deliver the information that can precisely match the information transfer. Investigations have centered upon the information-searching behavior of users. Researches have explored ways in which users make use of information, the types of demands placed on IR, the preferred types of information channels or output formats and the level of satisfaction expressed by the user.

Based on these facts, the research methodology employed for this study is user-oriented evaluation, which is mainly based on descriptive survey method. Specifically, the research procedures and techniques used in the study are as follows.

1.6.1. Data Collection Techniques

1.6.1.1. Questionnaire : A questionnaire was prepared and administered during the study for the purpose of soliciting information related to the existing IR system of the library. Initially, a pilot survey and testing of the questionnaire was made using small user groups. Based on this, the initial questions were verified and modified to ensure their content validity and clarity.

The purpose of this user survey through the questionnaire was to collect information and data about the existing IR practices and facilities from the users' viewpoints. The library user opinions and attitudes towards the effectiveness of the IR services were gathered. Moreover, the requirements and suggestions of users to improve

the current IR is also explored to obtain information that would be used to identify and to propose alternative mechanisms and tools for improvement of the IR system.

1.6.1.2. **Interviews:** This method was used to verify the information that had been gathered through the questionnaire, and in particular, to fill the gaps where questions had not been answered by respondents or areas that had not been covered by the user survey. With separate sets of interviews or discussion guides both the technical and service unit staff members of the library summing 16 individuals were interviewed. Besides, another discussion guide was prepared for the Head Librarian and an interview was held with him to obtain facts on the management issues of the library IR system, (see appendix II and III for the details of the interview questions and the lists interviewees).

1.6.1.3. **An Observation:** was made during various visits to the library. The purpose of the observation technique was to ascertain the status of IR facilities of the library, as well as to observe the behavior of users in searching and using the library resources.

1.6.1.4. **Through Document Analysis:** Various secondary information sources and related literatures such as books, journals, manuals, reports and the IES library records were examined and consulted for obtaining certain related facts and information. An information analysis and consolidation technique was used to obtain related facts from these documents.

In addition to these data collection techniques used for the survey, user inquiry records, diary method and personal experiences of the research (as a member of the library staff) were also employed as a source of data and means of generating additional and related information for the study.

1.6.2. Sample Design

Considering the major four core disciplines of Ethiopian Studies, the total number of AAU staff members and students (4th year and post-graduates) was obtained from the departments of Ethiopian Languages, History, Sociology and Social Anthropology. Based on the last 6 months registered recommendation letters of the external users of the library (i.e. users outside AAU community), their total number is also estimated and determined. Accordingly, the user population of the library is stratified into four user groups and stratified proportional sampling technique is employed to determine the sample size for which 25% of each user category is considered in the questionnaire. A purposive/judgment sampling method was then used to identify and recruit the users to fill the questionnaire and to answer the questions. For the staff interview technique, most of the senior library staff members and the management are considered and approached. The subjects (sample units) involved and considered in the survey are composed of the following categories.

1.6.2.1.**End-users** attitude and needs assessment survey covered a total of 81 library users which are about 25% of the total population of the IES library users. Most of them (about 85%) were academicians and researchers of AAU.

1.6.2.2.**Library staff**, both technical and service unit staff members were approached and interviewed. Four technical staff members (i.e. catalogers) were interviewed based on discussion guides (questions) prepared. Similarly, eleven user service staff members were contacted and interviewed. The head librarian was also interviewed based on the discussion guide questions prepared for the purpose.

Moreover, various informal discussions were made with the IES research staff members, the head librarian and staff members of the Ethiopian collections section at the Kennedy library (which has similar holdings and IR system) in order to obtain related facts

about IR practices and facilities. Likewise, other experts and related personnel within the University and other related agencies were also contacted for various purposes.

1.6.3 Data Analysis and Prototype Development

The data collected in the study was statistically analyzed using the computer application facilities available at SISA. The software used for data analysis include Microsoft word 7.0, SAS and other related packages. The application software and program used for prototype database and system development is CDS/ISIS version 3.07 (Unesco, 1993). This application of software was chosen since it is already being used at the IES library for card catalogs and printed index production.

1.7. Scope and Limitation of the Study

As it has been indicated earlier, this study is mainly concerned with assessment of the IR practices and facilities at the IES library with the intention of identifying the existing retrieval system limitations and exploring alternative tools and mechanisms for improvement. An attempt is made to investigate and assess the library information storage and retrieval practices and facilities such as cataloging/indexing and searching services in relation to their users' requirements. After the investigation of the current IR system performance status and identification of certain tools and mechanisms for its improvement, a prototype computer-assisted thesaurus database was proposed and developed for further investigation and implementation.

However, the areas/subjects covered by Ethiopian Studies and its information center (i.e. the IES library IR system) are too wide to be covered in such an academic work of very short duration. Thus, rather than trying to cover the entire available or identifiable

IR mechanisms and tools for the improvement of the accessibility of the library resources the study is limited to the demonstration of a prototype computer-assisted thesaurus database. Moreover, in spite of a wide range of disciplines, or subjects and the publication of documents in various languages in the library holdings, the study mainly focused on the major topics of Ethiopian History selecting English terms for designing and constructing this prototype computer assisted thesaurus database.

Nevertheless, a good deal of effort was made to show a general guideline and framework for the development and implementation of computerized thesaurus database on Ethiopian studies.

The application software and programs that were used for the data analysis, the development of the prototype database and design of its interfaces are also limited to the computing facilities that are available at SISA and which are well experienced by the student researcher. Due to time and financial resources constraints, as well as various technical problems, there was no formal testing made to evaluate the developed prototype computer assisted thesaurus database. However, a number of informal discussions were held, and demonstrations were made for both technical and service unit staff members of the library.

In general, no attempt was made, to make a detailed investigation and evaluation of the existing library IR system in its strict sense, at least at this initial assessment stage. Nevertheless, based on the user requirements, a general, yet worthwhile, assessment of the existing IR practices and facilities of the library was undertaken, addressing their current limitations and mechanisms for their improvement. It is believed that the findings, conclusions and recommendations of the study are potentially very important guidelines or indicators for future investigations and researches on improvements of the existing library information storage and retrieval system.

1.8. Organization of the Thesis

This thesis is composed of six chapters. The first chapter introduces the study. It gives the background and statements of the problem, justification of the study, its objectives, significance, research methodology as well as its scope and limitations. The second chapter is concerned with the literature reviews on the background of information storage and retrieval system (IR) and its evaluation studies. It gives an overview of IR system evaluations and components together with the development of research methodologies and criteria for IR evaluation study. To this end, various related literatures were consulted and reviewed in order to provide information about similar researches previously undertaken and approaches or methodologies and criteria employed for the IR evaluation. The third chapter provides brief descriptions and highlights about the Institute of Ethiopian Studies (IES) and its library. Highlights on establishment, objectives, functional structures, existing resources and services of the library are offered in this chapter. The fourth chapter presents the findings of the assessment survey, i.e. analysis of data and facts obtained on the existing IR practices and facilities of the library. It also discusses and interprets the results of the study in view of identifying the existing problems and proposing alternative tools and mechanisms for improvement of the current library IR system. The fifth chapter introduces and demonstrates procedures and techniques used for the proposed prototype database, i.e. computer - assisted thesaurus. The last chapter presents conclusions and recommendations of the study.

CHAPTER TWO

INFORMATION STORAGE AND RETRIEVAL SYSTEM AND ITS EVALUATION STUDIES

Information storage has been started with the recording of information. The storage of anything, including information, has an obvious purpose. It is stored for later use and therefore needs to be retrieved. As noted in the previous chapter (section 1.1.), the complexity of, and the need for IR have highly increased with the rapid advancement of R & D activities in Science and Technology. This has resulted in the massive generation and production of information. On top of this, the corresponding and parallel increasing needs of users for timely access, retrieval and utilization of existing relevant information (for further R & D) have called upon information systems designers and professionals to develop and employ more effectively and efficiently improved IR tools and mechanisms.

In this chapter, therefore, the general background and theoretical foundation of IR system and its evaluation studies will be examined and reviewed. It begins with the historical background; functional components and mechanisms of IR system followed by an overview of the development of IR evaluation studies, methodology and criteria. In the latter case, some of the related studies previously undertaken by various researchers on IR system evaluation will be reviewed and presented in summary.

2.1. Information Storage and Retrieval System

2.1.1. Historical Developments of IR System

Although cave walls, clay tablets, animal hides and so on had been used for storage and representation of information, it was the advent of relatively cheap paper and printing machine that made information something that could be mass-produced. Along with the mass generation and production of information came the need to systematically organize

and retrieve it. The conventional indexing, classification and cataloguing systems have been developed to allow or enable documents to be organized and retrieved on demand.

The major advance made by information storage and retrieval mechanism was seen as documents organizing function. It provided libraries that no longer just store books, but also the places where different documents were classified, cataloged and indexed for systematic arrangement and retrieval of information. After printed indexes and card catalogs microfiche offered convenient and increased storage capacity but it did not allow the direct processing of information, which became a possibility with the development of the computer technology and the availability of online storage and retrieval media for dissemination of information.

Generally, Lancaster (1979:15), Gilchrist (1996) and Chowdhury (1994:193-196) have provided broad chronological division of the development stages of IR system summarized as follows:

Pre – 1940: Pre-coordinate Indexes, such as printed indexes, book and card catalogs (manual forms).

1940s: The first post-coordinate indexes, or coordinate indexing systems manually manipulated.

1950s: Punched cards equipment and microfilm retrieval systems.

1960s: Computer based IR systems operating via magnetic tape in an off-line batch-processing mode; improved microfilm systems.

1970s: Computer-based systems operating online, computer output microform (COM) and mathematically sophisticated IR models.

1980s: String, keyword and keyword frequency searching proved to be efficient, CD-ROM technology and natural language processing started to be considered for IR.

1990s: Full text database handling, natural language advancement; improvement of user interfaces, application of artificial intelligence, hypertext/hypermedia, best-matching, and global information networks and retrieval systems.

2.1.2. Components and Functions of IR Systems

As noted earlier, IR is usually concerned with textual information. It mainly deals with the representation, storage and access to documents or representative documents (i.e. document surrogates such as indexes and catalogs). In this context, the goal of IR is not to provide information directly, but rather to provide information about where the relevant document/s can be found. Considering the inputs and outputs of such IR, Salton and McGill (1983) state that the input information is likely to include natural language text of the documents or document excerpts and abstracts. The output of an IR in response to a search request consists of sets of bibliographic references.

The major processes involved in a conventional communication model of IR system is represented schematically in figure 1 as follows.

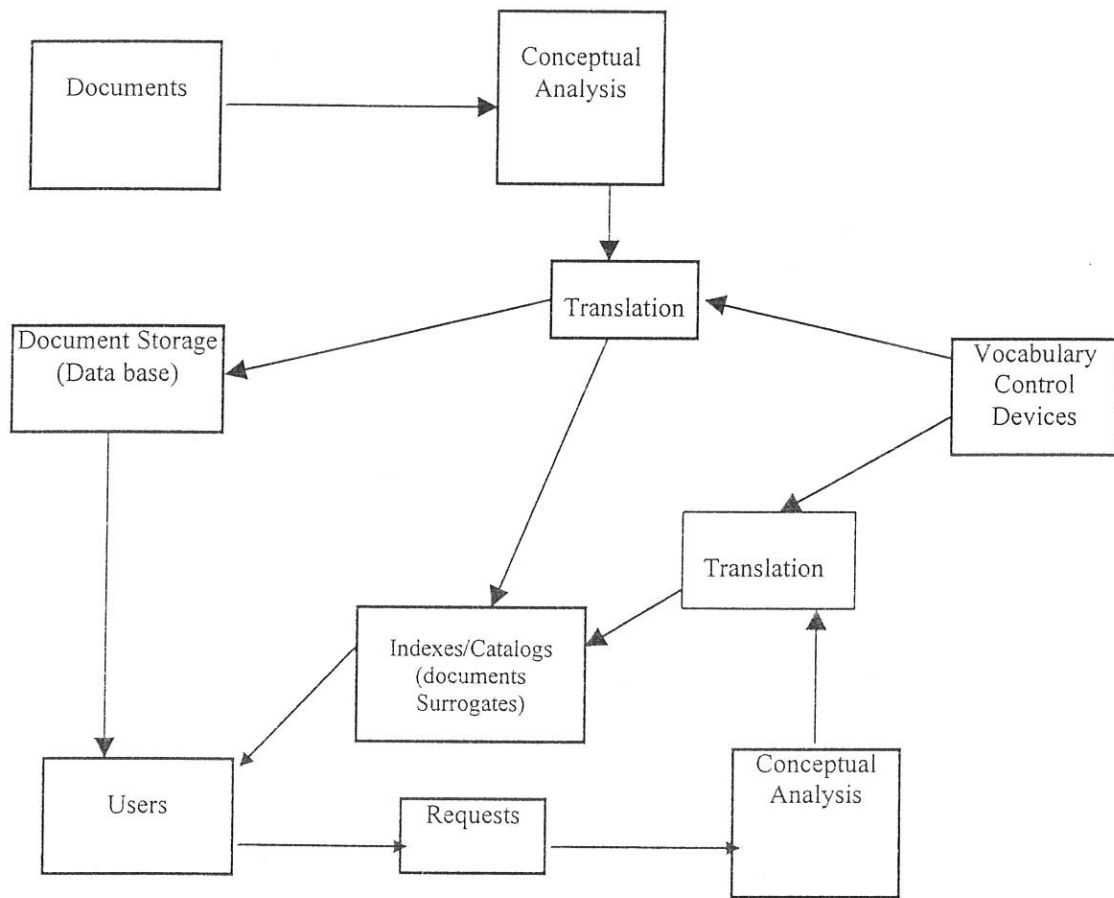


Figure – 1. The major components of an information retrieval system (adapted from Lancaster, 1986:2).

Considering these components of the IR system more broadly, Rowley (1993:112) states that all IR processes can be viewed as comprising three stages, namely Indexing, Storage and Retrieval. Based on these broad stages, let us briefly consider each of the three components of IR below.

2.1.2.1. Description and Indexing

Once the documents are acquired, they need to be ‘organized and controlled’ so that they can be identified and located in response to various types of users requirements. Organization and control activities include classification, cataloging, subject indexing, and abstracting or bibliographic compilations. The description and indexing subsystem, although primarily concerned with the subject approach, require access through many non-subject devices such as author, title, corporate bodies/organization and other names involved in the item to be retrieved. Two of these important elements, i.e. authors and titles, which are the physical description of the documents involve a process called descriptive cataloging. Both authors and titles are usually employed to locate documents in the catalog, and bibliographies by the name of the author or title entries.

However, of all operations required in IR, the most crucial and probably the most difficult ones consist of assigning appropriate terms and identifiers capable of representing the content of the literary collections. The process called subject cataloging/indexing involves the assignment of content identifier to the documents and is designed to fulfill three related purposes:

- (1) To allow the location of items dealing with topics of interest to the user,
- (2) To relate items to each other, and thus relate the topic areas, by identifying distinct items dealing with similar or related topic areas, and

(3) To predict the relevance of individual information items to specific information requirements through the use of index terms with well defined scope and meaning (Salton and McGill, 1983: 52-53).

As depicted in figure-1, the subject cataloging/indexing process involves two quite distinct intellectual steps: the 'conceptual analysis' of a document, and the 'translation' of the conceptual analysis into a particular vocabulary. For appropriate and efficient conceptual analysis and its translation, the indexer needs both the understanding of the subject matter of the documents and a good knowledge of the needs of system users.

The second step in the indexing process is the translation of the conceptual analysis into a particular vocabulary (or indexing language). In most IR systems, this requires and involves the use of a 'controlled vocabulary' devices which are comprising a limited set of terms that must be used to represent the subject matter of documents. Such controlled vocabulary devices include a list of subject headings, classification scheme, a thesaurus, or simply a list of "approved" keywords (Lancaster 1986:3). In the same way, Turner (1987: 52-54) also elaborates these two stages of subject-indexing as follows.

The subject indexing process involves two distinct elements although, in practice, an individual indexer ends in blurring them together. For the first, i.e. topic/subject analysis, indexers knowledge of the user and the use to which the information will be put have a bearing on the process of analyzing concepts. The second is the translation process of analyzed and identified concepts into the language of retrieval system using certain IR tools such as classification schemes, an alphabetical list of subject headings or thesaurus. The importance of vocabulary control for this translation process is that it supports and allows the indexer/cataloger to turn an analysis of the concept or theme contained in the item/document into the language, which the user/searcher will be using for IR. As the function of the retrieval system is to ensure that this matching process takes place, efficient

translation into such standard vocabulary is important. The vocabulary control devices and other related major IR tools are further discussed in the next section.

2.1.2.2. Storage

Once the indexing and description processes have been completed, the documents are entered into some form of document store (document data base) while their surrogates (indexes or catalogs) are kept into separate database. Then the documents' surrogates are organized in such a way that they can be systematically arranged and searched in response to various types of requests of the users.

Therefore, indexing or cataloging is a process that produces and enables various document surrogates such as printed or online indexes and catalogs, for items to be stored and manipulated or retrieved in a wide variety of fashions whilst the document itself is retained in some information store or physical arrangement. The physical arrangement of the information store may, however, also be an important part of the retrieval system. Some searchers or users may find that browsing of or interaction with actual document itself is far more valuable and creative than having to search through surrogates such as catalogs and indexes (Turner, 1987:5).

2.1.2.3. Searching

After accomplishing the indexing and storage process, the IR has produced the indexes, catalogs and physical arrangements that allow the user to search the system. The retrieval or searching subsystem allows the user to structure information and present it to the system in a way that will ensure a reasonable match with the information held.

The steps involved at the output (searching) side of the service are very similar to those involved in the input. A user submits various requests to the information center, and the user or an intermediary prepares search strategies for the requests. It is convenient to consider the preparation of search strategies as also involving the two steps of conceptual analysis and translation. The first step involves an analysis of the requests to determine what the users are really looking for, and the second involves the translation of the conceptual analysis of the request, translated into the language of the system (Turner, 1987:6 and Lancaster, 1986:4).

Based on the above illustration, most of the IR system can broadly be described as consisting of documents and their representatives/surrogates, a set of requests, and some mechanisms for matching or determining if any of the documents meets the information requirements/requests of users. The procedure for determining which information source should be retrieved in response to a given query is often based on representation (translation) of the requests and document descriptors or index terms drawn from the controlled vocabulary devices. The accuracy and consistency of information given in document surrogates will have very significant bearing on the user satisfaction with the IR system. Therefore, as it is clearly indicated in figure-1 the role of the vocabulary control device is becoming vital to provide terms to describe the subject matter of the document and for indexing terms to be used for searching the documents in the store or databases.

On the other hand, in the (modern) computerized IR system environment, lots of efforts have been made to handle most of the IR activities through the application of information technology. Automatic indexing mechanisms, which are often based on statistical analysis of the words and phrases used in the text of documents, are employed for content representation. Salton and McGill (1983) state that terms describing the contents of a document could be obtained by selecting words from the text and that this extraction could be based on frequency information. However, as evidenced by Rowley

(1992:445), there is still disagreement as to what the best method for the selection of terms, and as to whether the tendency in operational systems is to index every term, except those very frequently occurring terms that are included in the stop word list.

Nowadays, various electronic media and computerized application programs are also developed employed for storage and retrieval of information. These include the development and application of IR technology in searching languages, user-system interfaces, the matching subsystem and output presenting formats and other components of IR systems (Rowley, 1993: 117 and Simui 1995:76-78).

2.1.3. IR Mechanisms and Tools: The Concept of Subject Approach

2.1.3.1 An Overview of Subject Approach to Information

Over the last decades, various mechanisms and tools have been devised and developed for the purpose of information storage and retrieval. Traditional or conventional IR thinking and practice tend to concentrate on the manual way of preparing a systematic list of bibliographic interaction for documents. These lists include card catalogs, printed bibliographies and indexes, which are major tools for IR.

Regarding this, Rowley (1992:7) pointed out that in order to organize knowledge, libraries and information professionals have created a variety of tools. Traditionally, the tools of information retrieval have been book and card catalogs, printed bibliographies and indexes. Now, computer held databases and their indexes are central to the organization of knowledge.

In conventional libraries/information systems most of the users approach and seek information either by known-item searches or by subject searches. Due to the fact that the majority of the problems associated with retrieval is concerned with searching for materials

on specific topics, subject cataloging and indexing are the two major types of mechanisms used for information representation and retrieval in most libraries and information centers. Indicating the reason behind this difficulty, Foskett (1982:9) states the problems of the subject approach to information as being more severe because they are more complex and indeterminate.

The concept of the subject approach to information, also known as content representation, is usually used for organization and retrieval of library resources. An extensive list of subject headings such as Library of Congress Subject Heading (LCSH) and Sears List of Subject Headings (SLSH) and various library classification schemes have been used as subject access provision supporting tools to the contents of items in library holdings.

Emphasizing the role of the subject approach for IR, Turner (1987:51) argues that, although author and title are access points, the majority of users are interested in the subject access mechanisms and facilities approach to information. Therefore, IR is mainly concerned with the subject access mechanisms and facilities. As noted by Salton and McGill (1983:21, 53-54), a distinction has to be made between controlled and uncontrolled vocabularies. The information to be stored may also be available in the form of natural language texts, and the mechanisms used to represent the documents include both controlled and uncontrolled vocabulary which, separately or in combination, constitute the indexing/retrieval language.

In the case of uncontrolled vocabulary, the indexing process transforms the natural text of information items into the elements of the indexing language. However, many information experts feel that an uncontrolled indexing vocabulary, which, in principle, can include the whole variety of the natural language, introduces too many opportunities for ambiguity and errors. Hence, controlled indexing language and devices such as thesaurus is often advocated in which the term available for content identification is uniformly

controlled. This permits the control of spelling and elimination of synonyms by identifying semantically related terms.

The subsection that follows discusses the two major vocabulary control devices, or tools called classification schemes and alphabetical subject approaches.

2.1.3.2. Classification Schemes and the Subject Approach

Classification Schemes have a long history in the retrieval of information. They try to indicate the relationships between subjects by grouping them into a particular order, which should allow the user to identify a 'map' of all the various relationships within a particular broad subject area. Turner (1987: 54-55) discusses the role of classification of the subject approach as follows. One particular aspect of the classification of the scheme is that it is an extremely useful way of actually arranging material. This is because each classification scheme uses a notation to show its particular arrangement and grouping of concepts and therefore this notation acts as a very efficient short hand for some fairly complex concepts. It is obviously far easier to use this shorthand notation for arranging multi-type and multilingual documents and other materials than it would be to use the alphabetical words that describe the subjects.

However, examining some of the major limitations of using bibliographic classification schemes such as the Dewey Decimal Classification (DDC) for information storage and retrieval, Turner (1987:65-76) identified the following problems.

- Over a long period of time, it is anticipated that each main class will eventually be totally restructured. The difficulty here is, of course, each restructuring involves a library or information unit having to integrate its old stock with the old numbers into the new classification scheme. This will require some detailed reclassification at times, which costs a lot in terms of time, labor and money.

- Most of the conventional classification schemes including the DDC are designed for libraries with a collection that spans most of the field of knowledge. They therefore don't provide the details and specificity required in many of the special libraries and information units. Because the notation base is fairly short, all classification numbers tend to become long when the common subdivision or special factor is applied for specific topic of documents
- Most of the conventional and general classification schemes are also designed primarily for academic collections with an arrangement and series of relationships that mirror the interests of academic libraries in Europe and America, thus biased towards Anglo-Saxon, or Western library collections. Often, they may not be relevant to the needs of many non-Western libraries or information centers with local collections and users of their own.

Moreover, because classification schemes use a notation to describe subject concepts, the call numbers assigned to documents lack meaning and thus require some sort of alphabetical index or translation. Users will need an alphabetical entry vocabulary or index, which lists all the words that they will need to search under and translates them into the notation of classification scheme.

2.1.3.3. Alphabetical Subject Approach

Alphabetical subject headings offer an approach based on the very words and phrases that searcher patrons use in everyday speech. There seems to be an innate simplicity about designing a retrieval system that allows searchers to think of the words that describe the problems they are interested in and then look them up to find information that answers the particular problems. It is from this belief that the alphabetical subject approach develops.

Among the major advantages of this approach, Turner (1987) outlines two of the following.

- We shall need to design a system which both the searcher and indexer can agree on and what the various terms mean.
- We shall need to make sure that there is a structure in the catalog or index to ensure that the user/searcher can be guided from one particular access point to another so that they can widen their search and pick up a whole range of related material. Through the provision of cross references, the user can enter the system at a particular subject heading, find all the relevant items and then can be led to a wider range of alternative subject headings under which there might be linked materials.

However, certain problems are observed in the alphabetical subject approaches (Turner, 1987: 104). Problems arise when subject heads that consist of more than a single term are needed. Few retrieval systems can survive using simple terms, and most need to be able to specify elements. For instance, Sears List of Subject Headings (SLSH) indicates that such compound terms are allowed but, unfortunately it is extremely inconsistent in showing the order in which such terms should be placed. It is this sort of inconsistency, which shows the very ad hoc growth in SLSH and similar traditional subject heading lists. This inconsistency is irritating for both the searcher and the indexer.

The difficulties of identifying a particular citation order in traditional lists such as SLSH or LCSH resulted in a far more theoretical approach to the whole business of designing and producing alphabetical subject headings. The development of the thesaurus, with some advanced features and facilities, is one of the outcomes of these efforts.

Thesaurus is a compilation of words and phrases showing synonyms, hierarchical and other relationships and dependencies, the function of which is to provide standardized vocabularies in an information storage and retrieval system. It is a controlled vocabulary of semantically and generically related terms covering specific areas of knowledge (Rowley 1992: 252). Emphasizing its role for IR and the rationale for its development, Turner (1987:111) states that thesaurus is a controlled vocabulary device that can be used for both indexing and searching. The construction and production of vocabulary control devices such as thesaurus is of course, time consuming but worthwhile if no alternative

efficient subject heading tool is available for IR. The production of a thesaurus is a useful way of analyzing the information needs of users and the structure of the subject discipline.

Indeed, the development of appropriate thesaurus is becoming a key tool in the subject analysis, indexing and retrieval of information in many modern special information centers or libraries. Kesete (1975:1) also confirms this by stating that special library catalogers and users may find the conventional standard codes as inadequate to fulfill their need for document organization/storage and retrieval. This necessitates the need for devising and developing IR tools to suit and satisfy the local demands.

In general, the objectives of vocabulary control tools such as thesaurus and subject headings in IR can be summarized as follows:

1. To promote the consistent representation of subject matter by indexers and searchers, thereby avoiding the dispersion of related materials. This is achieved through the control of synonymous or near synonymous expressions, and by distinguishing them among homographs.
2. To facilitate the conduct of a comprehensive search on some topic by linking or bringing together, in more than one way, terms whose meaning are related paradigmatically or systematically (Lancaster, 1986:7-8 and Pao,1989:116).

Taking into account the role and potential of the thesaurus in improving IR, a number of researches have been undertaken in recent years, example Bekele (1992), Apotaghric (1994) and Amira (1995).

However, no matter what indexing/retrieval language or mechanism is employed, it is always necessary to take into account two major characteristics of IR tools and their indexing terms or products known as “exhaustivity” and “specificity”. Exhaustivity refers to the degree to which all the concepts and notions included in a document are recognized in index/catalog descriptions. Specificity, on the other hand, refers to the level the index terms are used to characterize the document contents. Thus, non-specific vocabularies give

the users a higher level of recall (i.e. exhaustive retrieval of all related items) while high specific vocabularies ensure better precision, i.e. the retrieval of only highly relevant items.

2.1.4. Computerized IR Tools and Facilities

2.1.4.1. Computerized Catalogs

As it has been noted earlier, users should be the focus in IR facilities or services, including cataloging and indexing principles and services. All other considerations, such as convenience and the desire to arrange entries in some logical order, are secondary to the basic rule that the subject access points or headings should be that which users would seek in the IR system. Thus, the user approach or preference in accessing and using information should have a priority consideration in designing and developing any IR tools and facilities including the computerized text retrieval systems.

Considering the importance of employing computers for developing and maintaining a thesaurus, Lancaster (1986:11) outlines the following:

1. Computers can be used to expand the structure of the thesaurus;
2. They can generate printed thesaurus handouts;
3. Computers extremely facilitate updating and the maintenance of the thesaurus terms;
4. They allow the vocabulary to interface with indexing and searching operations; and
5. They allow online display and browsing of the thesaurus terms.

However, the currently exhibited wide variety of access points and IR mechanisms presented to users in most online catalogs indicate that there is no agreement as to what extent the user prefers or requires for seeking and retrieving relevant documents in the database. The choices seem to depend more on what fields are searchable within the bibliographic record rather than on any user search approach criteria.

Hildreth (1989) and Larson (1992) have defined three “generations” of online catalog systems each with distinct facilities for user interaction with the system, and significant differences in the search or retrieval methods employed. First-generation online

catalogs usually mimicked the card catalog in providing only simple left-to-right matching (with implicit function) between users query and the indexed fields of the catalog record. Second-generation online catalogs supplemented (or sometimes replaced) this simple “exact phrase” matching with key words searching and Boolean operator adopted from online commercial IR systems. Hildreth (1989) outlines a number of limitations or deficiencies of the first and second-generation online catalogs as tools for effective subject access, including lack of the following:

- Sufficient assistance with translation of entered query terms into the vocabulary used in the catalog,
- Provide online thesaurus aids useful for subject founding and topic searching,
- Lead in facilities for the searcher/user from free text search term to the corresponding subject headings or class numbers assigned to a broader range of related materials.

Larson (1992) states that the deficiencies with subject access in first-and second generation online catalogs very often lead to two commonly observed results frequent failures in: searching failure and information overload. These problems lead to a third generation online catalogs, which increase the browsing of catalog databases by adopting hypertext linking and capabilities.

Generally, progress towards a more interactive and effective online catalog, or any IR facilities depends on the regular assessment of functions and a greater research effort to be made to improve the effectiveness of the existing IR, supported by information professionals and all parties concerned. More empirical data on users themselves are required, since speculating about user requirements alone is not sufficient. Indeed it could even be misleading. Thus the challenge for the library professional is to take a more active role in ensuring that the findings provide feed back to operational design.

Having this general background information on a computerized IR system, let us now consider the IR functions and facilities of micro-CDS/ISIS Software.

2.1.4.2. Micro-CDS/ISIS Software

A CDS/ISIS is a menu driven generalized information storage and retrieval system (software) designed and developed specifically for the computerized management of structured non-numerical data base (UNESCO, 1989).

Micro-CDS/ISIS software was developed and produced by Unesco for IBM microcomputer and compatibles in 1985. Unesco made a fast improvement on it and came up with two versions, version 2.3 and 2.32, in 1989 followed by the 1992 version 3.0 of the software. After a year, in the 1993 versions, 3.03 and 3.07 were released. Presently, the window version (WINISIS) of the package is on the way to be released. Our brief discussion of the software IR features here is based on the previous recent version (Micro-CDS/ISIS 3.07) which is in application in most of the developing countries libraries, including the library of the IES.

Micro-CDS/ISIS is an IR system for information storage, processing and retrieval of textual databases. Unesco is distributing micro-CDS/ISIS free of charge to non-profit making organizations. Due to this and some other good features of the software, an increasing number of libraries/information systems of developing countries, including Ethiopia, are using it for the creation and manipulation of bibliographic referral type and factual databases. Thus, our discussion of the IR features and facilities of the CDS/ISIS software is mainly based on the Micro ISIS 3.07, which is currently being used at the IES library.

In CDS/ISIS, all records of given databases are stored in the master file and are assigned a unique number automatically. The master file is associated with the inverted file through a cross-reference file. The inverted file consists of six physical files of which five contain a dictionary of searchable terms organized in a B-tree. According to the software users reference manual, the Unesco (1989) files that are maintained by CDS/ISIS

can be broadly categorized into two, based on their purpose: system files, and database files, each of which may also be further classified into mandatory, auxiliary or user files.

The software performs its functions by using two groups of programs and system programs. The user program consists of different individual programs that perform data entry and record editing, information retrieval, printing output, and inserted file maintenance. The system programs consist of those programs that define new databases and modify the existing ones, perform utility functions, interchange data with other systems, and provide programming facilities.

Data elements in CDS/ISIS are stored in fields the collection of which make up a record. The fields of CDS/ISIS are of variable length and so are the records. This feature allows a high rate of disk space utilization and gives freedom in defining the maximum size of fields and also makes a field or its part optional. Allowing fields or their parts to occur more than once, to be repeatable, is also the other good feature of CDS/ISIS. The major IR functions of CDS/ISIS, according to Unesco (1989:4) facilitate the following activities:

- Definition of data-bases containing the required data elements;
- Inputting new records in a given data-base;
- Modification, correction or deletion of existing records;
- Automatic building and maintenance of fast access files for each database in order to maximize retrieval speed;
- Retrieval of records by their contents, through a sophisticated search language;
- Display of the records, or portions according to user requirements;
- Sorting out the records in any sequence desired;
- Printing of partial or full catalogs and/or indexes;
- Development of specialized applications using the CDS/ISIS interrupted programming facilities.

The software accomplishes these tasks using a database that consists of a number of logically related but physically distinct computer files. Some of the major ones are: database definition files, which consists of field definition table (FDT), data entry work sheet and field select table; Master file; Inverted file; and ANY file.

As it is a textual IR system, CDS/ISIS does not use the relational model to structure databases. The data is, therefore, defined in a single master file. It uses the 'REF' function and 'L' formatting function to establish some simple relationships. The search mode of CDS/ISIS is based on an inverted file and the search language is based on Boolean logic. Its IR service provides facilities to browse master file, display search results, change display formats, execute previous search, change dialog language, save search results, search formulations and recall the previous ones, and if required, to display terms dictionary to select terms from.

Some of the search facilities available on CDS/ISIS include Right truncated Search Range search Field and Proximity, Relational search, Any term search, and Free text search. In its multilingual nature, Amharic, Arabic, Chinese and some other language scripts of East Europe and of India are available, in addition to the Latin/Roman Scripts (Simui, 1995:27). The output component of the system facilities allow the users to change the default line width, number of columns, column width, lines per page, and indentation using the system print worksheet features.

With these general backgrounds and understandings about the components, mechanisms and tools of IR system, let us consider the approaches and criteria of its evaluation in the following section.

2.2. Evaluation of IR System

An evaluation is basically a judgment of worth, merit or an appraisal of value. Evaluation is a process involving the evaluator, the object of evaluation and some underlying assumptions and values associated with the object of evaluation. In evaluating a retrieval system, or any information service, one monitors and assesses its operation and performance in terms of desired effectiveness level, the benefits derived from and costs

involved in it (Pao, 1989:215-216). Librarians have become aware of the needs to evaluate the system they use, with two major objectives in mind: to provide the system with facilities or services of most value to the user and to develop the most efficient and effective IR system accordingly. Nowadays, evaluation is rapidly becoming a branch of IR in its own right (Foskett, 1982: 518). However, as indicated by Swanson (1978), the process of evaluation is highly complex, difficult and subjective. It is also distinguished from other studies or scientific inquiries by its purposive orientation. An evaluation study is basically an investigation of the achievements of the goals or expectations of a system and its users.

Bearing these facts in mind, in the next few subsections, we will briefly discuss the evolution, methodology and criteria of IR system evaluation based on the survey of related literature and review of some IR evaluation studies.

2.2.1. Evolution of IR evaluation studies

It is probably reasonable to believe that some form of evaluation of information sources and services has been practiced for as long as there have been libraries and record keeping systems. What is thought, as information system evaluation today, however, is much more recent vintage (Bawden, 1990:64). Agreeing with Bawden, Gilchrist (1996) indicates that interest in evaluation has developed and continued at high level since the 1940s when comparative examination of the merits of a classified catalog and alphabetical subject catalog was a favored paper of librarians. This interest in evaluation has progressively continued rapidly since then, with the subjects and styles of evaluation changing to suit new technical developments, operational needs and theoretical attitudes.

On the other hand, Foskett (1982:518) further states that, for many years librarians tended to take IR systems for granted. Classification schemes were part of the librarian's

way of life and catalogs were compiled according to sets of rules drawn up by librarians to meet the requirements of the user as seen by the librarian. In recent years, attitudes have changed; accepted ideas are increasingly subject to challenge and to close scrutiny as costs rise faster than funds, and as providers of funds begin to question whether they are getting the value for their money. However, the need for IR system evaluation is aggravated and is becoming more vital with rapid increment of information and users equipment for its effective and timely access mechanisms.

Most information scientists and professionals do recognize the two classic evaluation studies carried out at the Cranfield Institute of Aeronaut as a landmark of particular importance in the development of IR system assessment. This is mainly due to their contribution and provision of a general framework for evaluation of both experimental and operational IR system upon which the next studies were founded. Cranfield I began in 1957. It was a laboratory style evaluation aimed at comparing different types of indexing language such as hierarchical classification and alphabetical subject catalog. Cranfield II was launched in 1963 for further investigation of the indexing languages and their effects on retrieval performance. Information professionals like Lancaster and Ellis, as cited by Solomon (1997:46), have recognized the significance of these studies as a starting point and a test that provided the ontological and methodological framework within which the evaluation of IR system first developed.

Most of the post Cranfield studies undertaken in the 1960s and early 1970s were generally concentrating on isolated aspects of operational information system indexing languages and the corresponding searching procedures. One early and particularly interesting example of the evaluation of operational retrieval system is Lancaster's MEDLARS evaluation during 1966-68. The study was set out to examine such factors as indexing exhaustively, inter-indexer consistency, specificity and depth of indexing language, and differences in performance for different types of request. But it did consider

the management view rather than the requirements of users. Another significant study which was made on INSPE to develop effective search strategy showed that controlled indexing terms fared better overall than free terms (Bawden, 1990:70).

Generally, Chowdhury (1994:52-53) and Gilchrist (1996) have categorized the development stages of IR evaluation which can be summarized as follows.

The first decade IR evaluation studies are mainly concerned with the assessments or comparison of indexing systems. This first trend is that away from reliance on a single 'scientific' model of evaluation towards a more complex mix of quantitative and qualitative methods, based more on social science research. The second decade IR evaluation researches are more focused on comparison of differences between various indexing languages in terms of indexing exhaustivity and specificity, search techniques, relevance and efficiency assessment. These researches are emanated from the requirement to find new means of evaluation to cope with problems presented by advancement of IT (information technology). The technologies employed for IR are initially mechanized documentation and retrieval ones, then computers, then online systems and now expert systems, optical media and hypertext or hypermedia applications for IR.

In sum, the history of IR system evaluation is one of the developments of an increasing armory of techniques and methods, coupled with a frequent inability to relate the results obtained to the practical problems of system improvement (Bawden, 1990:74).

2.2.2. Review of Related Studies

Research lays its foundation on the existing facts. In the same way as IR researches develop starting from finding the ways to improve the manual tools such as card catalogs and printed indexes. These tools and facilities had been recognized as foundations for the research on the application of computers in IR system.

Broadly, library catalog use assessment studies can be divided into two major categories (Lancaster, 1988:82):

1. Those studies designed to determine what proportion of the patrons of the library make use of the catalog. It tries to distinguish between the characteristics of the catalog user and those of non-users, to determine how the catalog is used and for what purpose and perhaps to discover why some library users never consult the catalog.

2. The major and the second types of studies, in which this research could also be included, are those that focus on the patrons known to use the catalog. The major objectives of such studies are to discover how the patrons use the catalog, for what purpose and with what degree of success. Printed questionnaires and scheduled interviews/discussions methods could be employed to come up with good results.

Seymour and Schofield (1973) attempted to develop a simple method to be employed to evaluate the use of library catalogs by requesting the users to note details of items not found in the catalogs. To discover the cause of 'failures' library staff then checked the items. Such information shows the extent of the users exploitation of the library IR services and resources. User groups with least IR success were identified to discover the gaps between library resources and their accessibility on demand.

Cochrane (1989) also reviews the problems of users of online public access catalog (OPAC) and argues that it is necessary to think of all searching problems as systems problems rather than users failures, and to concentrate research in the area of systems enhancements. A list of improved tools needed for subject searching in online catalogs is identified including online thesaurus and authority controls. These commonly involve enhancing the catalogs with additional terms, or incorporating subject authority files or additional thesauri in the database.

Similarly, Hancock-Beaulieu (1990) indicates that a more interactive process should be promoted by providing query expansion through a combination of searching aids for matching. He concluded that the online catalog environment alone doesn't appear to have increased either the extent of subject searching or the use of the bibliographic tools. A study undertaken by Yao (1995) based on user preferences has also indicated the importance of the user approach and preference for the representation, interpretation and measure of the relevance or usefulness of documents.

More recently, Solomon (1997) has assessed the performance of PADdev IR system, which is a bibliographic database of PADIS, from the point of view of professional system users and the current technological development requirements. He has

identified various limitations of the database and showed that the IR capabilities of the database do not meet both the users' and technological requirements for which he forwarded long-and short-range recommendations to be further considered for the improvement of the database IR services.

2.2.3. Methods of IR Evaluation: the User-Oriented Approach

IR evaluation techniques are not likely to find widespread favor and application unless their usefulness can be convincingly demonstrated. It is therefore important to understand the appropriate methods or approaches in the evaluation of retrieval system and procedures. As it has been noted earlier, satisfying the information needs of users are the major factor of consideration in developments and/or improvements of IR system. An assessment of the real requirements of users and the determination of their implication for IR service is very difficult unless an appropriate evaluation methodology is employed and followed in a formal study. Thus, here we stress the user viewpoint, or the user-oriented evaluation (UOE) of information system and examine its role in assessments of IR services. A user could be either an end-user of a system or its direct user. The former is the one who is a direct user or consumer of information while the latter is the user of the system in the sense of being a searcher, provider, indexer or cataloger (Bawden, 1990:6)

According to Vickery and Vickery (1992:261-62) the ultimate evaluation of an information system must be looked at from the viewpoint of users, considering whether they have received the required information and the acceptability costs of obtaining the information. Confirming this fact, Bawden (1990:90) also suggests that an evaluation of any operational system, including IR, should be evaluated in an appropriate way, basically in a holistic, qualitative, user centered fashion. The applicabilities and abilities of the employed evaluation methodologies to address the existing real problems and to promote

practical and immediate improvements in information services are absolutely essential. In this connection, Salton and McGill (1983:161) and Cleverdon, cited by Bawden (1990) further point out that an information system evaluation and its technique should be user-centered rather than management centered, if the results are to have a general applicability and relevance. This clearly shows that UOE method is becoming crucial for IR system evaluation.

Sell (1980), cited by Bawden (1990:5), uses the term 'user-oriented' in referring to a methodology based on questionnaires to assess user satisfaction, and for evaluating the effectiveness of services in an academic library. Similarly, Boon (1982) describes a methodology for system evaluation from a user point of view, emphasizing qualitative user judgment of performance. Bawden (1990:93-95) also elaborates the concept of User-Oriented Evaluation (UOE) as follows.

User-oriented evaluation (UOE) is a very definite action research. Action research is a research that is not only done for the sake of increased understanding but with a specification of aiding the decision maker to improve the situation under investigation. Each evaluation of this kind is carried out with the aim of generating information which may be used in some way, to improve the information system and its services. It is usually micro-rather than macro-evaluation UOE is undertaken, quite deliberately and specifically, to consider the system being evaluated within its operational context, rather than as an isolated entity. This has a considerable implication for the methods which should be used, and the sort of results which it is expected to come up with.

As it can be understood, UOE mainly emphasizes the importance of evaluation to the provision of information services by examining the system firmly within its operational context, and hence cannot but contribute directly to an overall improvement of service provision. This type of evaluation can not only be purely objective but also includes, as an

integral component, a commitment to improved service provision; it shares this approach with some kinds of social 'evaluation' research.

Generally, evaluation research is developing from being system-oriented to being user-oriented, and has come out of the laboratory to the operational environment. The concentration on recall and precision of the system is shifting to considering all the other features of the system under investigation (Solomon, 1997:53). It is with this understanding that this study has adopted and employed the user-oriented paradigm of evaluation, and considers to assess the IR practices and facilities of the IES library from its users viewpoints.

2.2.4. Criteria of IR System Evaluation

With respect to any activity, including IR, evaluation raises the questions of how well it has been performing, how beneficial it has been and with what cost? (Vickery and Vickery, 1992:262). The user of the services of any kind usually questions and evaluates them, consciously or unconsciously, against cost, time, and quality criteria (Lancaster, 1979:108). We need various criteria to answer such questions and judge the performance of information services, including an IR system. We must search for the appropriate measures of the IR effectiveness that enables us to demonstrate an improved outcome resulting from the use of retrieval systems.

Before considering some of the major IR criteria, let us briefly look into the implications of Ranganathan's five laws of library science for IR evaluation, summarized from Lancaster (1988:8-10).

The first law 'Books Are For Use' implies that one must evaluate collections and services in terms of the needs of users and cost-effectiveness. The evaluation criteria is

“accessibility”: can the library service make information sources accesible to the requester, at the time he or she needs it, from what ever source and in what ever form?

Ranganathan’s second law 'Every Reader His Book'is a logical extention of the first law. The volume of use is meaningless unless one can convert it into a “satisfaction rate”. For everything looked for, how much is found (success) and how much is not found (failure)? This indicates that it is not enough that required documents are owned by the library. It must also be retrievable and available when needed.

The thrid law 'Every Book Its Reader' complements the second law. Library services need to be functionally more dynamic by making users aware of new publications of possible interest to them. Libraries should be concerned with exposure as well as with accessibility. The significance of this law is that documents must be readily available for their potential users and users must be able to readily find the documents they need. Accordingly, one can conclude that for every acquired item of library resources, there are potential users existing in the community. A library should therefore be evaluated in terms of its ability to inform users of materials of potential interest to them.

The fourth law 'Save the Time of the Reader' virtually pervades all others. Information service must be concerned not only with satisfying needs but also with satisfying needs as efficiently as possible. It is now well known that the accessibility of information services is the major determinant of their use. Some one is likely to judge a service to be “inaccessible” if it requires too much time and effort to use.

The fifth law the 'Library is a Growing Organism' indicates that the library must be willing and able to adapt to new conditions. This would include adaptability to changing and increasing information requirements of users and technological developments. With the development and application of information technology for IR, some form of online access to information sources on demand is replacing access through “ownership” of

conventional library services. Thus, access rather than ownership should be the main criteria which a library should use to evaluate resources and services.

Bearing in mind these fundamental principles or laws by which library information services should be evaluated, we will discuss some of the major IR evaluation criteria below. A special emphasis is given to criteria of IR evaluation from users viewpoint, which is going to be adopted and employed for this research.

As we move toward the UOE technique employment for IR system performance assessment, we start to integrate the whole picture and determine what aspects of the system are important to all users versus just helpful for certain groups. This will ultimately lead us to understand the nature and role of retrieval system. The IR judgment criteria were then assessed or compared from the user viewpoint to see the performance level of the existing IR system organization access, search and retrieval facilities.

Hersh (1994) states that user-oriented evaluation approach abandons the focus on the technical aspects of the system, looking instead at the impact of the IR services upon the information needs of individual users. IR systems should ultimately be judged by how well they help users in their task of consulting the systems whether it is to assist them to make correct decisions or to lead them to some improved state in what they do with the information.

Generally, the theoretical background of evaluation research shows that IR can be evaluated against the following criteria summarized from different sources.

Considering the manual library card catalogs, and the assessment and use suited criteria, Lancaster (1988:85) describes an important element in catalog use and assessment. This study will be an analysis of the reasons why users fail to find entries present in the catalog. The results of previous studies suggest that the following factors are all important:

1. The users previous experience with library catalogs and with the one now being studied in particular.
2. The users general intelligence and perseverance.

3. The amount and quality of information brought by the user to the catalog, for instance, right and correct author/title.
4. The search approach followed by the user.
5. The number of access points provided by the catalog.
6. Whether the catalog is a dictionary catalog or one that is divided and how it is divided.
7. Other characteristics of the catalog, including the extent of missfiling and the quality of guiding or labeling.

Lancaster further states that the information requirement of the user is the major criteria for literature search evaluation. Broadly, the user may want to find a single or selected representative items or comprehensive search (to find everything relevant) on a topic or subject. He also noted that the criteria and procedures used to evaluate a subject in online bibliographic databases would be equally adaptable and applicable to the evaluation of subject search in printed indexes and card catalogs with some modifications.

Showing the nonexistence of appropriate and clearly defined standard evaluation criteria and measures, thus making it a subject of debate and vital concern in IR researches, Su (1994) has listed the following ones.

- Relevance using both recall and precision measures.
- Utility or value or worth of search output as a whole.
- Physical and mental efforts expended in searching
- Efficiencies of the system, particularly its response time
- User satisfaction concerned with search results completeness, thoroughness, relevance and importance to meet the user needs.
- Success or user judgment of the overall system success.

Moreover, Su (1994) remarks that the above evaluation criteria are mainly devised and used for retrieval assessment based on users judgments of the IR success.

The following are some of the functional requirements listed by Chowdhury (1994) and Rowley (1992 and 1993) that a user-oriented IR system should meet.

1. Information should be provided in a form suitable for ready access.
2. The scope of the system should be broad enough to cover all kinds of IR requirements of the user community.
3. The system should be capable of storing and providing the right information at the right time.
4. Information provided should be easily accessible.
5. The system should be adaptable to environmental and technological changes.
6. The system should maintain standards for protection of data.

7. The system as a whole should devise ways for facilitating oral communication.
8. The system as a whole should be easily accessible and convenient to use.

Gilchrist (1996) argues that an IR system is perfectly effective if it provides for the nearest possible coincidence between the description of a subject by a searcher and the description used to enter documents on that subject in the system. He further argues that in such a system we would have the position in which every relevant document would be retrieved when a search was made, without the production of a single irrelevant document. This was, of course, the idea of Van Rijsbergen (1975:4), and Rowley (1993:129).

Taking into account these various criteria this thesis therefore assesses the fulfillment of major IR requirements and related criteria.

CHAPTER THREE

THE INSTITUTE OF ETHIOPIAN STUDIES LIBRARY

The IR practices and facilities that this research work is set out to assess are part of the Institute of Ethiopian Studies (IES) library system. Therefore, this chapter gives background information about the IES and its library. Brief description will be given on the establishment, objectives, structures, resources, users and IR practices and facilities of the library. Moreover, previous works on the IES library and related studies are briefed and reviewed.

3.1 The Institute of Ethiopian Studies (IES)

3.1.1. An Overview of the IES Foundation

Ethiopia has been the subject of inquiry for scholars both outside and within the country. The strategic geographical location of Ethiopia, straddling as it does the ancient routes of trade and civilization between Africa, the Middle East, and the Mediterranean Countries, has contributed to its becoming an integral part of the decisive regional historical processes whose influence in many cases has been of worldwide significance (Chepkwony, et.al. 1992).

Although the existence of research and researchers in the field of Ethiopian Studies could be traced back to the time when foreign travelers began coming to Ethiopia, it is believed that research received an impetus with the establishment of modern education in the country during the early twentieth century. This impetus was further strengthened later by the foundation of post-secondary (tertiary) education institutions. Regarding this, Pankhurst (1990:12) states that with the establishment of the University College of Addis

Ababa (UCAA) in 1950, an extra-curricular student organization, the Ethnological Society was established in 1951. The members of this society were encouraged to take an interest in Ethiopian cultures and customs and began to publish papers in their organ "the Ethnological Society Bulletin", in 1953.

In 1961, the University College was renamed the Haile Sellasie-I University (HUS) and was further expanded with the formation or establishment of a number of faculties and departments concerned with the Arts and Humanities. Merid (1984:XXV) says that the contribution to the development of research in Ethiopian Studies by students and staff of Addis Ababa University (the current name of former Haile Sellasie University) are all remarkable concerning historical and social issues of the country. Particularly, the essays and thesis research works of students become notable not only for their originality but also for their depth of analysis in terms of relevance to Ethiopian researches and developments.

The field of Ethiopian Studies seems to comprise almost everything related to Ethiopia. However, it mainly covers certain subjects such as Ethiopian history, culture, sociology, anthropology, ethnology, languages, literature, and the folklore of Ethiopia and related disciplines. Currently, the major four focal areas of study being conducted by the Institute of Ethiopian Studies (IES) are Ethiopian History, Ethiopian Social Anthropology, Ethiopian Sociology and Ethiopian Languages/Linguistics (Azene, 1996).

3.1.2 Establishment, Organization and Objectives of the

Institute of Ethiopian Studies (IES)

Several factors had led to the establishment of the Institute of Ethiopian Studies (IES) in 1963 at the University located in the former (Haile Sillasie I) palace building.

These factors were:

1. The need to present some kind of Ethiopian exhibition to visiting Heads of States;

2. The question of international academic relations which were then becoming increasingly important for Ethiopia, and
3. The overriding need to promote and expand research, as well as the scholarly knowledge of Ethiopia within the University itself in all academic disciplines (Pankhurst, 1990)

Accordingly, among other things, the tasks of the Institute include hosting scholarly international conferences, symposia and exhibitions, seminars, workshops, developing close ties with foreign related institutions and sponsoring researches of foreign visiting scholars by giving technical and scholarly advice and allowing them to use the library facilities. In addition to its internal organizational units, the Institute is working cooperatively with related academic and research institutes, including the Institute of Development Research, the Institute of Educational Research, and the Ethiopian Collection Division of the University library system. The Institute also has a good relationship with governmental and non-governmental organizations such as the Institute of Ethiopian Agricultural Research Organization, the Ethiopian Science and Technology Commission, the Ministry of Education, the Ministry of Culture and Information, and the National Library of Ethiopia.

The Institute of Ethiopian Studies (IES) has two major objectives:

1. To conduct, promote and coordinate research and publication on Ethiopia with special emphasis on the humanities and cultural studies; and
2. To aid in the conservation of the Ethiopian culture heritage by collecting, cataloguing and displaying in a museum objects reflecting the material culture of the nationalities of Ethiopia (Tadesse, 1990:1 and IES Brochure, 1995).

To achieve these and its other major objectives, the Institute has organized itself into three major units, namely: Research and Publications, Library and Museum. The research and publication unit is mainly concerned with conducting and coordinating research and publications on Ethiopian Studies in the IES publications such as the Institute's Bulletin, Journal of Ethiopian Studies and Conference Proceedings. The

Museum unit is dealing with collection and preservation of cultural and historical objects for the present and future generation for the purpose assisting research workers along this line.

Besides, the Institute is supported by the Society of Friends of the Institute of Ethiopian Studies, which is founded in 1968. The Society has played an important role in supporting and promoting the Institute to achieve its objectives. As indicated in its brochure (1995) comprising most of the affiliated research on Ethiopian Studies as its members, the Society of Friends of the IES assists the institute in:

- (i) Raising funds for its valuable collection development and maintenance;
- (ii) Introducing Ethiopia and its culture to various local and foreign communities or nationalities through its series of meetings and lectures throughout the year.

3.2. The Institute of Ethiopian Studies (IES) Library

3.2.1. Developments and Objectives of the Library

On January 18, 1963, the director of the IES wrote a letter to the University President indicating that the Institute intends to build unique collection on Ethiopia in order to achieve the best use of library resources. Among the proposals made, the major ones were indicated to be the following:

- The need for an organization of a sizable working collection on Ethiopia for the use of students doing research at the University College.
- Since the Institute will be in close contact with the learned world and expects visitors as research workers in the near future, the establishment and organization of the library is a matter of considerable urgency.

Accordingly, the IES library was officially established in June 1963 through the transfer of the ethnological collection of the Ethiopian Section of the former University College of Addis Ababa. It remained as part of the IES administration until May 1967 when it was merged with the University Library System. After about two decades, in August 1995, the IES library was returned to its original parent organization and became part of the IES administration to which it still belongs.

With regard to the aim of the IES and its library, Chojnacki (1969:15) states that one of the main activities, among many others, is to gather handwritten or printed, materials on Ethiopian studies. The documents are maintained and made available not only to the present generation but also to the future ones. Thus, acquiring /collecting the historical and cultural materials, preserving, cataloging and making them accessible for related research and studies is one of the most important tasks of the Institute and its library.

The library was, therefore, set up to serve as an information center for both current and future researchers on Ethiopian studies. Over the last three decades, it has been serving as one of the major information resource and service center on Ethiopia for both local and foreign scholars. Addressing the specific objectives of the library, Degifie (1990) has outlined the following points. The objectives of the library are:

1. To acquire and organize documents on Ethiopia to make them readily accessible to assist a serious research on Ethiopian Studies by reputable foreign and Ethiopian scholars from both outside and within the University community. Thus AAU communities, including academicians, researchers and its visiting scholars or professors are welcomed whenever they wish to do research.
2. To maintain and preserve, within its premises, a library of documents in any language and format concerning Ethiopian Studies.

Accordingly, the library serves its users primarily for spot reading and referral purposes. It is a closed stack access library without loan services except under special circumstances when users are allowed to borrow for few days. The library also offers photocopying services on demand for published materials.

3.2.2. Functional Structures Resources and Users of the Library

To facilitate its activities and/or services, the IES library has organized itself into five departments: Manuscripts and Archives, Ethiopian Languages, Foreign Languages, Periodicals, and Technical Processing and Administration Departments.

Generally, the IES library has a very rich collection of books, pamphlets, periodicals, and a growing archival collection on Ethiopian Studies, both in Ethiopian and foreign languages.

Leaving the manuscript and archives department, which is currently under investigation by a fellow student researcher, the next section will briefly discuss the holdings of the rest of the three library departments as follows.

The Ethiopian Languages Department consists of books, pamphlets and other documents in Ethiopian Languages such as Geez, Amharic, Oromo, Tigre, Gurage, Kunama, Afar, etc. These Ethiopian languages collection of the department is considered almost complete and comprehensive since most of the documents produced on Ethiopian Studies in local languages are acquired and maintained by the library.

The Foreign Languages Department includes non-local language collections on Ethiopian Studies. These materials comprise documents in English, French, Italian, German, Arabic, Spanish, etc. The collections of this department are the largest in size having a number of documents on Ethiopia and some materials of the Horn of Africa.

The Periodicals Department of the library embraces all serial publications produced in Ethiopia and few published abroad. The Technical Processing and Administration Department is concerned with acquisition, cataloging and management of the library resources.

Broadly, the staff of the library are categorized as professionals (BA/BSc or above), paraprofessionals (diploma holders) and the supporting staff based on their academic

qualification. Tables 3.1. and 3.2. below summarize the holdings and staff of the library respectively, excluding the manuscript and documentation section.

Table 3.1. Departmental and Linguistic Distribution of the Library Collections

| Department Sections | Languages | Estimated Size of collection | |
|--------------------------------|------------------|------------------------------|------------|
| | | Number (Volumes) | Percentage |
| Foreign languages | English | 72,000 | 62.3 |
| | Non-English | 14,000 | 12.1 |
| Ethiopian Languages | Amharic | 18,000 | 15.6 |
| | Non-Amharic | 8000 | 6.9 |
| Periodicals (Bound volumes) | In all languages | 3500 | 3.0 |
| Total | | 115500 | 100 |

Table 3. 2. The Library Staff

| Department | Number and Academic Qualification | | | | |
|-----------------------------------------|-----------------------------------|------------------------|---------|--------|-------|
| | 2 nd Degree | 1 st Degree | Diploma | Others | Total |
| Foreign Languages | - | 1 | 2 | 9 | 12 |
| Ethiopian Languages | - | 1 | - | 1 | 2 |
| Periodicals | - | - | - | 1 | 2 |
| Technical Services | - | - | 5 | - | 6 |
| Administration and Secretarial services | 2 | - | - | 6 | 8 |
| Total | 2 | 3 | 8 | 17 | 30 |

Note: Blank-spaces (-) indicate absence of staff member in the corresponding columns and rows of the table.

As indicated in the table above, the staff of the library consists of a head and deputy librarian, 3 professional and 19 supporting staff and 6 technical staff. The library management claims that there is a shortage of secretarial staff and skilled technical processing staff.

As it has been indicated by both Abebe (1993) and Azene (1996) and discovered through the discussion held with the librarian, the four major user groups of the IES library are: AAU staff, Graduate students, Senior undergraduate students (4th year and above) and External researchers (from both abroad and within the country). In line with the four core major disciplines of Ethiopian Studies, which the library was set up to serve, the major

fields of specialization of most of the library users are: Ethiopian History, Studies of Ethiopian Languages, Anthropology and Sociology. However, users with an academic background of related peripheral fields are also part of the library users.

3.2.3. An Overview of IR Tools and Facilities used at the IES Library

This section introduces some of the existing major IR tools and facilities of the library, including catalogs, printed indexes and bibliographies. Based on the data that are obtained from the related document analysis and the discussions held with the library staff, a brief and general description of the manual IR practices and recently launched computer-based IR facilities are offered with a view to providing the basis for analysis and discussion in the next chapters.

The major available IR devices usually employed for classification and cataloging purposes at the library are: the Dewey Decimal Classification Scheme and its locally adopted version reference manual and Anglo-American Cataloging Rules, second edition (AACR2). Although, a copy of the Library of Congress Subject Headings and the Sears List of Subject Headings are available, due to their lack of appropriate headings for Ethiopian Studies and the special collection of the library, they are not employed and used for document cataloging. This has been one of the major reasons for lack of subject access points in the library catalogs.

Like any conventional library, the major retrieval tools and/or facilities that are currently in use at the IES library are printed indexes and the card catalogs. The library users are expected to search the library catalogs and indexes, which then provide them the location of the identified document/s using certain symbols, notations or call numbers. Accordingly, the major types of the library catalogs, which are prepared and arranged to serve for IR are:

- Foreign language collection author/title dictionary catalogs: these contain both title and author entries inter-filed and arranged in alphabetical order.
- Foreign language collection classified subject catalogs: these have access points, which are classification symbols or notations. They have been drawn from the Dewey Decimal Classification and its adopted version of the library classification guide manual. These card catalogs also include both microfilms and transliteration of local periodical title entry.
- The Ethiopian Languages collections have separate title and author catalogs. They are arranged in alphabetical order document author and titles.

Besides the card catalogs described above, various printed indexes and bibliographies are also used for IR. The IES library has some printed indexes including visible index to its periodical collection, and some author and title indexes of documents. The library also has various bibliographies which list not only the bibliographic information of documents in the library but also those which are found in other libraries and information centers. Some of the bibliographies have been marked (with certain symbols) to indicate the documents which are available in the IES library.

As it has been learnt through the interviews held with the librarian and the staff, and from various minutes of the library, currently there is a plan to automate the existing manual services of the library. To this end, recently, the library has also developed a home-grown catalog database using 'FORCLN' the micro CDS/ISIS software version 3.07. The database has about a thousand foreign language document catalog records and is mainly used for card catalog and printed index production.

Before we proceed to the data analysis of the next chapter, let us have a bird's eye view of the previous works made on the IES library.

3.2.4. A Brief Review of Studies Related to the IES Library and Its

Information Services

Over the last few years, various studies were made on the IES Library and information services from different perspectives.

Gupta (1991) conducted a brief survey and recommended compilation of indexes and bibliographies of the various library collections and their publicity and accessibility to the user. Although her recommendations are indeed valuable in indicating the need for preparing and promoting bibliographies and indexes to improve the library IR service, she didn't address and assess the limitation of the existing IR practices and facilities as well as the library user requirements.

Abebe (1993) conducted a feasibility study for the development of a prototype computerized Ethiopian Resource Center Database to support and enhance the information services offered at the IES and its library. According to his survey, complexity of the library catalogs and difficulty in identifying or finding relevant information sources on a specific topic(s) is the major source of dissatisfaction for the IES library users. He indicated that a good deal of effort is required and thus has to be made to solve such problems and to cope up with the growing information requirements of the library users.

Abebe then suggests and recommends further studies for the development and implementation of the designed prototype database and an automated information system that will meet the users needs by over coming the short comings of the existing conventional services of the library.

In his study on the IES library reference services, Azene (1996) also indicated that information retrieval in Ethiopian Studies is highly challenging as it required lots of efforts from both library staff and users for identifying and retrieving required materials. Thus, to

minimize the workload of reference librarians, and to enhance the reference services of the library, Azene proposed and developed a prototype expert reference advisory system.

More recently, Woinshet (1997) has also made a study on the museum section of the Institute. She identified that recording and maintaining of accession register and card catalogs, together with the required item information retrieval, are the major routine and time - consuming activities that are handled and occupied the lion's share of the working hours of the museum staff. Most of these problems are also true for the library unit. Bearing these IR tools and facilities of the library in mind, their performance effectiveness and related features will be assessed in the following chapter.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

It was indicated in the objective of the study (section 1.4.) that this thesis was mainly aimed at investigating and assessing the IR practices and facilities in the IES library from the users point of view. To this end, as pointed out in the methodology section (1.6.1.), both the major user groups and the staff members of the library were considered and taken as important sources of data for the study. Accordingly, as it was indicated in the first chapter (section 1.6.2), the broad user groups of the IES library belong to the four core disciplines of Ethiopian studies. They were therefore, taken into account for the user questionnaire survey.

A stratified proportional sampling and a purposive/judgment sampling technique were employed in combination to obtain the sample size of the library users who filled the questionnaire. Twenty-five (25) percent of each of the four user group members were included into the sampled population which sums and gives 81 individual users (i.e. 25%) of the total 325 major user population of the library. Accordingly, the questionnaire (see Appendix I) was prepared and proportionally distributed to the 81 individuals (sample units), members of the four user groups of the library. Out of the total 81 distributed, questionnaires 72 respondents completed and returned the questionnaire, which gives the survey a response rate of 88.8%. Based on the responses of these 72 respondents and the interviews conducted with the library staff this chapter presents the data analysis and discussion as well as a brief summary of and implications the findings of the study. The details of the library users questionnaire administration is given in table 4.1. as follows.

Table: 4.1. Distribution and Response Rate of User Questionnaires.

| User group | Questionnaires | | | |
|-------------------------|----------------|------|--------------------------|------|
| | Distributed | | Returned (Response Rate) | |
| | No. | % | No. | % |
| Under graduate Students | 30 | 37.0 | 28 | 93.3 |
| Postgraduate Students | 19 | 23.5 | 17 | 89.5 |
| AAU Staff | 22 | 27.2 | 18 | 81.8 |
| External Users | 10 | 12.3 | 9 | 90 |
| Total | 81 | 100 | 72 | 88.8 |

As it was also indicated in the methodology (section 1.6.2) for the library staff interviews, in addition to the head librarian, four senior technical processing and eleven circulation service (totally 16) staff members were contacted and interviewed. The interviews were conducted based on four sets of discussion guides (See Appendix II) prepared and distributed to each of the interviewee in relation to his/her job at least eight days before conducting the interviews. Besides, document analysis and observation techniques were employed to obtain additional information pertaining to the study. The recently launched home grown computer-based library catalogs database IR features and facilities were closely examined and/or investigated. This was done in order to assess the potential capability of the database to alleviate the constraints of manual IR system and to meet identified requirements of library users.

The subsections that follow provide the analysis, interpretation and summary of the implications of the findings using various descriptive and analytical statistical techniques deemed appropriate for the survey.

4.1. **Data Presentation and Analysis**

This section deals with presentation and analysis of gathered facts and data on both the manual and computer-based IR practices and facilities of the library. As it was previously indicated, although a computer-based catalog database has been recently

launched and other library services automation are under consideration, actually it is the manual IR practices and facilities that have been used in the IES library over the last three decades. Manual IR facilities and services such as classification, cataloging, searching and retrieval of the library collections and their document surrogates (including card catalogs and printed indexes) are still predominantly practiced and used in the library. The library users have to search or browse through the library card catalogs or some printed indexes for identification and retrieval of the bibliographic information (of the sought document). These document surrogates provide the users brief bibliographic descriptions of the actual location of the required items within the closed stack of the library. Considering their major functional role for IR, this assessment survey has given a special emphasis to these manual and conventional IR practices and facilities of the library.

The next and the major part of the data presentation and analysis thus deals with the facts and data obtained through the 72 library user questionnaire responses and facts gathered by interviewing the library staff members in relation to the manual IR practices and facilities of the library. Then the next subsection (section 4.1.2.) presents and analyzes the facts and data obtained from the assessment of the recently launched but not yet fully developed operational computer-based catalog database called 'FORCLN' IR features and facilities. Most of the data and information related to this database were obtained through a closer observation and examination of its IR facilities, and from the interview of database operator personnel.

4.1.1. Assessments of the Manual IR Practices and Facilities of the Library

Based on the questionnaire and interview survey responses, the data gathered through relevant document analysis, and observations this subsection looks into and assesses the existing manual IR practices and facilities of the IES library identify

constraints that inhibit the IR services and to explore tools and mechanisms for their improvement. As indicated earlier, this data presentation and analysis is accomplished in relation to the research questions and objectives of the study, (see sections 1.2. and 1.4.).

Accordingly the following subsection deals with the:

- Investigation and analysis of the existing IR practices and facilities in terms of their functional performance, usage frequency and rate of accessibility.
- General assessment of the adequacies, efficiencies and effectiveness of the existing IR tools/facilities.
- Identification of the frequencies and causes for user IR failures
- Determination of the extent of and the factors that affect user satisfaction or dissatisfaction with the existing IR facilities.
- Identification and determination of the constraints of the existing IR practices and facilities and
- Exploration of possible alternatives and improved tools and mechanisms that could be employed to upgrade the existing IR system/services.

4.1.1.1. Major IR Practices, Tools and Facilities of the Library: Usage and Accessibility

(a) Classification and cataloging tools/facilities and IR procedures of the library.

The head librarian and the technical processing staff members of the library were inquired to describe the existing classification, cataloging or indexing tools, facilities, policies and procedures that are practiced and used in the library. They have pointed out that there is no formal and written policy or procedure manual that is designed and used for classification and cataloging of the library resources. Instead, general and informal rules and procedures are inconsistently followed and used by the library staff. However, there are some general classification and cataloging tools that are usually referred by the technical processing staff of the library. The functions and limitations of these IR tools or facilities that are identified through the interview held with the library staff members are summarized as follows.

Types and Functions or IR Tools.

- Dewey Decimal Classification (DDC) schemes, used for classification of the library collections by supplementing the adopted library classification reference manual
- IES library classification reference manual (adopted from the 16th ed., of DDC) used by catalogers for classification of library collection and by the users as reference guide to the library classified subject catalogs.
- Anglo-American Cataloging Rule, Second Edition (AACR2), supports the catalogers by showing and illustrating the styles, positions and types of catalog entries and headings.
- A copy of Library of Congress Subject Heading (LCSH) and Sears List of Subject Headings (SLSH) are also available at the library for assisting the subject analysis and classification of documents.
- Besides these major IR tools, other reference materials including transliteration guides, cataloging styles of dissertations and theses manuals are also used for organization and arrangement of the library holdings.

Limitations

- DDC does not accommodate classification notations or class numbers for Ethiopian publications and disciplines. DDC class numbers and their structures are also found to be inadequate and inappropriate for content representation and retrieval of most of the library resources.
- This modified and adopted classification reference manual is not complete, structured or well designed to cover and accommodate specific class numbers that represent the contents of the locally published documents and library user searching approaches, or retrieval requirements. It is too old to be used for IR of the current collections also of the library.
- AACR2 does not consider the distinctive features of Ethiopian authors' names and various entry features of the library collection in local language.
- All of these guides and reference manuals are also said not comprehensively structured to serve the technical processing (classification, cataloging/indexing) of Ethiopian documents adequately and efficiently
- Besides their shortage of supply few catalogers rarely use both these subject headings since they do not accommodate subject entries/headings that meet the library user IR approaches and local publication content/subject description.

Moreover, the library technical processing and circulation staff members were requested to describe the major procedures or steps that are involved in information storage

(classification, cataloging and retrieval/searching of documents) in the library. Their explanation and descriptions are summarized in table 4.2. as follows.

Table 4.2. Major procedures/steps that are commonly involved in document classification, cataloging and searching in the IES library.

| Steps | Procedures Involved in Document Classification and Cataloging | Procedures Involved in Document Retrieval/Searching. |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| 1 | Receive newly acquired document | User information inquiry (expressed information need) |
| 2 | Bibliographic verification (checking in the library catalogs if the received document is already processed/cataloged) | Identification of broad topics or location of related document using library general reference guides/manuals |
| 3 | Document content or subject analysis | Query formulation (identification of bibliographic information or search terms of required documents) |
| 4 | Identification of document subject or class number (classification notation) and its assignment to the document | Searching through the library catalogs or other bibliographic tools for required documents. |
| 5 | Descriptive cataloging (physical description of document by author, title, etc.) | Registration of identified document bibliographic information details on the library users request slip. |
| 6 | Typing and production of card catalogs and labels of the document | Submission of the completed request slip to the library staff at the circulation desk. |
| 7 | Proof reading and corrections of card catalogs and document labels | Document retrieval (by the library staff) |
| 8 | Submission of processed document and set of card catalogs to circulation unit, filing card catalogs in the library catalog cabinet trays and arrangement of document on shelf in the stock. | Document delivery (to the library user) |

(b) Usage Frequency of the Library and its IR Tools/Facilities

The respondents were requested to describe their purpose of using the library. Almost all, 68 (94%), of the respondents have mentioned that they visit the library to read or consult documents related to their research topic(s). The rest have indicated that they use the library to identify and read relevant materials for lecture notes and other various academic exercises.

The respondents were inquired to indicate the average frequency of their visit to the library. Their responses are given in table 4.3.

Table 4.3. Frequency of the Library Usage

| Library usage Frequency | Responses | |
|---------------------------------|-----------|------|
| | No. | % |
| Daily | 6 | 8.3 |
| 3 - 5 days a week | 34 | 47.2 |
| 1 - 2 days a week | 21 | 29.1 |
| Twice a month | 5 | 6.9 |
| Monthly | 4 | 5.5 |
| Rarely (Less than once a month) | 2 | 2.7 |
| Total | 72 | 100 |

In relation to the frequency of their visit to the library, the respondents were asked to indicate how often they use the various IR tools/facilities that are available in the library. Their responses are presented in table 4.4. as follows.

Table 4.4. Usage Frequency of the Library IR Tools/Facilities

| IR Tools/Facilities | Usage Frequency Responses | | | | | | | |
|-----------------------------------------------|---------------------------|------|-----------|------|--------|------|-------|------|
| | Always | | Sometimes | | Rarely | | Never | |
| | No. | % | No. | % | No. | % | No. | % |
| Library card Catalogs | 40 | 55.5 | 26 | 36.1 | 6 | 8.3 | - | - |
| Printed Indexes | 16 | 22.2 | 23 | 31.9 | 15 | 20.8 | 18 | 25.0 |
| Document Dietitian/Reference Notes | 8 | 11.1 | 19 | 26.3 | 29 | 40.2 | 16 | 22.2 |
| Printed Bibliographies and Reference Manuals | 12 | 16.6 | 18 | 25.0 | 28 | 38.8 | 14 | 19.4 |
| Current Acquisition Lists in the IES Bulletin | 6 | 8.3 | 16 | 22.2 | 22 | 30.5 | 28 | 38.8 |
| Ethiopian Publications Registers/Lists | 4 | 5.5 | 18 | 25.0 | 24 | 33.3 | 26 | 36.1 |
| Inquiring the Library Staff | 28 | 38.8 | 36 | 50.0 | 5 | 6.9 | 3 | 4.2 |

Note: Blank (-) space in table 4.4. above and next tables indicates absence of obtained Response/s for the corresponding item.

As indicated in table 4.4. the majority, 40 (55.5%), of the library users always rely upon the library catalogs and 28 (39%) of the respondents always ask the assistance of the library for IR. This was also confirmed by the circulation staff members who had mentioned that the library users frequently request them for assistance to find relevant documents on their topic(s) of interest. The remaining IR tools/facilities of the library are rarely, or never used on average by about 43% respondents.

Those respondents who had 'rarely or never', used some of the IR tools/facilities were further asked to indicate the reason for 'less' or 'never' using the tools. Most of them had indicated that they were not aware of the existence of the printed bibliographic and index tools. They also indicated that they were not familiar with how and when to use some of the existing IR tools. Some respondents also stated that most of the IR tools of the library are very complicated and time consuming.

(c) Accessibility of the Library IR Tools/Facilities

Based on their previous experiences, the respondents were requested to rate the accessibility of the library IR tools/facilities. Their responses are given in table 4.5.

Table 4.5. Accessibility Rate of the Library IR Tools/Facilities.

| IR Tools/Facilities | Accessibility Rate Responses | | | | | | | |
|-----------------------------------------------|------------------------------|------|------------|------|-----------------|------|----------------|------|
| | Readily Accessible | | Accessible | | Less Accessible | | Not Accessible | |
| | No. | % | No. | % | No. | % | No. | % |
| Library card Catalogs | 25 | 34.7 | 34 | 47.2 | 13 | 18.0 | - | - |
| Printed Indexes | 3 | 4.2 | 22 | 30.5 | 36 | 50.0 | 11 | 15.2 |
| Document Citations/Reference Notes | 2 | 2.7 | 26 | 36.1 | 28 | 38.8 | 16 | 22.2 |
| Printed Bibliographies and Reference Manuals | 1 | 1.3 | 21 | 29.1 | 33 | 45.8 | 17 | 23.6 |
| Ethiopian Publications Register/Lists | 6 | 8.3 | 13 | 18.0 | 35 | 48.6 | 18 | 25.0 |
| Current Acquisition Lists in the IES Bulletin | 5 | 6.9 | 12 | 16.6 | 37 | 51.3 | 18 | 25.0 |

As it is shown in table 4.5. except the card catalogs, which were rated as readily accessible by 34.7% of the respondents, the remaining IR tools are considered as readily accessible only by less than 8.5% of the respondents. On the other hand, the card catalogs are rated as less accessible by 13 (18.0%) of the respondents while the rest of the IR tools and facilities were rated as 'less accessible' and 'not accessible' on average by about 45% and 20% of the respondents respectively. Thus, most of the library IR tools such as printed bibliographies and indexes were rated as not readily accessible to the library users. The staff members had also indicated that no adequate effort was made to display and familiarize the IR tools with the users regularly.

Table 4.3. Frequency of the Library Usage

| Library usage Frequency | Responses | |
|---------------------------------|-----------|------|
| | No. | % |
| Daily | 6 | 8.3 |
| 3 - 5 days a week | 34 | 47.2 |
| 1 - 2 days a week | 21 | 29.1 |
| Twice a month | 5 | 6.9 |
| Monthly | 4 | 5.5 |
| Rarely (Less than once a month) | 2 | 2.7 |
| Total | 72 | 100 |

In relation to the frequency of their visit to the library, the respondents were asked to indicate how often they use the various IR tools/facilities that are available in the library. Their responses are presented in table 4.4. as follows.

Table 4.4. Usage Frequency of the Library IR Tools/Facilities

| IR Tools/Facilities | Usage Frequency Responses | | | | | | | |
|-----------------------------------------------|---------------------------|------|-----------|------|--------|------|-------|------|
| | Always | | Sometimes | | Rarely | | Never | |
| | No. | % | No. | % | No. | % | No. | % |
| Library card Catalogs | 40 | 55.5 | 26 | 36.1 | 6 | 8.3 | - | - |
| Printed Indexes | 16 | 22.2 | 23 | 31.9 | 15 | 20.8 | 18 | 25.0 |
| Document Dietitian/Reference Notes | 8 | 11.1 | 19 | 26.3 | 29 | 40.2 | 16 | 22.2 |
| Printed Bibliographies and Reference Manuals | 12 | 16.6 | 18 | 25.0 | 28 | 38.8 | 14 | 19.4 |
| Current Acquisition Lists in the IES Bulletin | 6 | 8.3 | 16 | 22.2 | 22 | 30.5 | 28 | 38.8 |
| Ethiopian Publications Registers/Lists | 4 | 5.5 | 18 | 25.0 | 24 | 33.3 | 26 | 36.1 |
| Inquiring the Library Staff | 28 | 38.8 | 36 | 50.0 | 5 | 6.9 | 3 | 4.2 |

Note: Blank (-) space in table 4.4. above and next tables indicates absence of obtained Response/s for the corresponding item.

As indicated in table 4.4. the majority, 40 (55.5%), of the library users always rely upon the library catalogs and 28 (39%) of the respondents always ask the assistance of the library for IR. This was also confirmed by the circulation staff members who had mentioned that the library users frequently request them for assistance to find relevant documents on their topic(s) of interest. The remaining IR tools/facilities of the library are rarely, or never used on average by about 43% respondents.

Those respondents who had 'rarely or never', used some of the IR tools/facilities were further asked to indicate the reason for 'less' or 'never' using the tools. Most of them had indicated that they were not aware of the existence of the printed bibliographic and index tools. They also indicated that they were not familiar with how and when to use some of the existing IR tools. Some respondents also stated that most of the IR tools of the library are very complicated and time consuming.

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Based on their previous experiences, the respondents were requested to rate the accessibility of the library IR tools/facilities. Their responses are given in table 4.5.

Table 4.5. Accessibility Rate of the Library IR Tools/Facilities.

| IR Tools/Facilities | Accessibility Rate Responses | | | | | | | |
|-----------------------------------------------|------------------------------|------|------------|------|-----------------|------|----------------|------|
| | Readily Accessible | | Accessible | | Less Accessible | | Not Accessible | |
| | No. | % | No. | % | No. | % | No. | % |
| Library card Catalogs | 25 | 34.7 | 34 | 47.2 | 13 | 18.0 | - | - |
| Printed Indexes | 3 | 4.2 | 22 | 30.5 | 36 | 50.0 | 11 | 15.2 |
| Document Citations/Reference Notes | 2 | 2.7 | 26 | 36.1 | 28 | 38.8 | 16 | 22.2 |
| Printed Bibliographies and Reference Manuals | 1 | 1.3 | 21 | 29.1 | 33 | 45.8 | 17 | 23.6 |
| Ethiopian Publications Register/Lists | 6 | 8.3 | 13 | 18.0 | 35 | 48.6 | 18 | 25.0 |
| Current Acquisition Lists in the IES Bulletin | 5 | 6.9 | 12 | 16.6 | 37 | 51.3 | 18 | 25.0 |

As it is shown in table 4.5. except the card catalogs, which were rated as readily accessible by 34.7% of the respondents, the remaining IR tools are considered as readily accessible only by less than 8.5% of the respondents. On the other hand, the card catalogs are rated as less accessible by 13 (18.0%) of the respondents while the rest of the IR tools and facilities were rated as 'less accessible' and 'not accessible' on average by about 45% and 20% of the respondents respectively. Thus, most of the library IR tools such as printed bibliographies and indexes were rated as not readily accessible to the library users. The staff members had also indicated that no adequate effort was made to display and familiarize the IR tools with the users regularly.

4.1.1.2. Accessibility of the Current Collection of the Library Resources.

The respondents were also asked to judge the timely accessibility of the current and newly acquired library resources (see question number 15, appendix I in the questionnaire). The majority, 42 (58.0%), of the respondents indicated that the recent documents are less timely processed and accessible while 23 (32.0%) of the respondents pointed out that these materials are not timely accessible at all. Only 7 (9.7%) of the respondents have indicated that they can timely access the current library collections.

Most of the circulation staff members also indicated that besides the delay of the current collection in the technical processing section, since the newly processed material card catalogs are inter-filed with the existing complex and cumbersome library catalogs, it is very difficult to trace and identify recent documents required by the users timely. Although some staff members have claimed that there is a regular display of newly received items in the display box, most of the users argued that they missed a number of relevant documents displayed during the week when they don't visit the library.

The respondents were further asked to describe the effect of 'less timely' or 'not timely' accessibility of current documents and their bibliographic information on their research and academic activity. Among a number of effects outlined by the respondents, the major impacts of the intimate accessibility of library resources are:

- Unnecessary wastage of time and effort in looking for the materials in other libraries and related information centers.
- Missing of relevant and useful information for research activities.
- Delays or hindrance research projects, and
- Incomplete and less quality research outputs.

Bearing in mind these inaccessibility problems of the current library acquisitions, the technical processing staff member were inquired to describe the reason behind the processing delay. All of them indicated that, due to the rapid increase of the library acquisitions, there are a large number of backlogs. Therefore, normally it will take 4-6

months of minimum average time to classify and catalog a given newly received document in the section. Above all, due to the absence of appropriate vocabulary control devices and inefficiencies and ineffectiveness of the existing classification, cataloging and other related technical processing tools, the time taken to process a given single document is too long.

4.1.1.3 Effectiveness, Efficiency and Adequacy of the IR Tools/Facilities

The respondents who had used the library IR tools, excluding those who had indicated 'never used' were requested to rate the effectiveness of the library IR tools/facilities and the obtained responses are presented in table 4.6. as follows.

Table 4.6. Effectiveness of the IR Tools/Facilities

| IR Tools/Facilities | Effectiveness Rate Responses | | | | | | | | |
|-----------------------------------------------|------------------------------|------|-----------|------|----------------|------|---------------|------|-----------|
| | Very Effective | | Effective | | Less Effective | | Not Effective | | Total No. |
| | No. | % | No. | % | No. | % | No. | % | |
| Library Catalogs | 3 | 4.1 | 19 | 26.3 | 33 | 45.8 | 17 | 23.6 | 72 |
| Printed Indexes | 2 | 3.7 | 19 | 35.1 | 20 | 37.0 | 13 | 24.0 | 54 |
| Document Citations/Reference Notes | 5 | 8.9 | 14 | 25.0 | 19 | 33.9 | 18 | 32.1 | 56 |
| Printed Bibliographies and Reference Manuals | 4 | 6.8 | 13 | 22.4 | 27 | 46.5 | 14 | 24.1 | 58 |
| Current Acquisition Lists in the IES Bulletin | 3 | 6.8 | 12 | 27.2 | 16 | 36.3 | 13 | 29.5 | 44 |
| Ethiopian Publications Register/Lists | 1 | 2.1 | 7 | 15.2 | 28 | 60.8 | 10 | 21.7 | 46 |
| Inquiring the Library Staff | 12 | 17.4 | 29 | 42.0 | 20 | 28.9 | 8 | 11.5 | 69 |

Note: The total number of respondents for which the percentages are indicated do not include the respondents who had indicated that they have 'never used' a given IR tools/facilities indicated in table 4.4.

Among the major reasons mentioned by users and circulation unit staff members for ineffectiveness of the IR Tools/Facilities:

- Some of the IR tools (or reference manuals) are not regularly revised and updated,
- Incomprehensiveness and unstructured nature and contents of the IR tools
- Most of the IR tools are very limited and lack specificity of terms for representation and retrieval of documents by their subject matter or contents.

- Complexity and inconvenience of entries/access points arrangements to use them for IR.
- Absence of alphabetical subject catalogs or pointed indexes and cross-references to guide users to relevant and related topics or documents on a given topic.

Respondents were asked to rate the library catalog access points/entries in terms and order of their importance or usefulness for searching/IR. The responses are summarized and given in table 4.7.

Table 4.7. Usefulness Rate of the Card Catalogs Access Points or Entries.

| Card Catalogs Access Points or Entries | Usefulness Rate Responses | | | | | | | |
|-----------------------------------------------|---------------------------|------|-----------|------|-------------------|------|---------------|-----|
| | Very Important | | Important | | Less Important | | Not Important | |
| | No. | % | No. | % | No. | % | No. | % |
| Author Entries/Indexes | 16 | 22.2 | 34 | 47.2 | 20 | 27.7 | 2 | 2.7 |
| Title Entries/Indexes | 22 | 30.5 | 36 | 50.0 | 14 | 19.4 | | |
| Call Numbers (classified subject catalogs) | 24 | 33.3 | 23 | 31.9 | 20 | 27.7 | 5 | 6.9 |

As it is indicated in table 4.7. all of the three card catalog access points namely document call numbers, the titles and authors catalogs are almost proportionally preferred and used by the respondents. In response to the request to indicate reasons for less or not used access points, some respondents complained that the library card catalogs are complicated and require users to refer to the back of the cards.

A number of users had also mentioned that most of the card catalogs are worn out physically and some bibliographic information recorded on them are not visible and challenge the user to locate the required document in the library. Both the library users and staff members have also pointed out that title and author added entries are not provided for most of the earlier and old library collection. As indicated by technical processing staff only about 10% of Ethiopian language collections are formally classified and cataloged while the remaining 90% of these collections are accessed with handwritten cards of brief bibliographic descriptions.

The respondents were further inquired to indicate their preferred search approach and additional access points that they would like to be incorporated in the library catalogs.

Most of the respondents had mentioned that alphabetical subject access or indexes, cross references and topic guides are essentially required and recommended tools to enable them to search by the contents of documents, topic of their research and related subjects. More specifically, the respondents were requested to judge the features and facilities provided by the library card catalogs based on evaluation scales ranging from 'very good' to 'very poor'. Their responses are given in table 4.8.

Table 4.8. Users General Judgment of the Library Card Catalogs IR Facilities

| Facilities/Features of the Library Catalogs | Users' Judgment Responses | | | | | | | |
|--------------------------------------------------------------------------|---------------------------|------|------|------|------|------|-----------|------|
| | Very Good | | Good | | Poor | | Very Poor | |
| | No. | % | No. | % | No. | % | No. | % |
| Appropriateness of the Arrangements | 3 | 4.1 | 14 | 19.4 | 42 | 58.3 | 13 | 18.0 |
| Adequacy of Access Points/Entries | 1 | 1.3 | 11 | 15.2 | 35 | 48.6 | 25 | 34.7 |
| Completeness of the Bibliographic Information Provided | 6 | 8.3 | 23 | 31.9 | 38 | 52.7 | 5 | 6.9 |
| Accuracy of the Information provided | 9 | 12.5 | 16 | 22.2 | 33 | 45.8 | 14 | 19.4 |
| Specificity of the Subject Description or Indexing Terms Provided | 4 | 5.5 | 19 | 26.3 | 29 | 40.2 | 20 | 27.7 |
| Adequacy of cross-references Provided | 2 | 2.7 | 9 | 12.5 | 36 | 50.0 | 25 | 34.7 |
| Ease of Usage/Convenience | 8 | 11.1 | 14 | 19.4 | 31 | 43.0 | 19 | 26.3 |
| Compatibility of the Catalog Access Points with Users Searching Approach | 5 | 6.9 | 17 | 23.6 | 28 | 38.8 | 22 | 30.5 |
| Adequacy of Guides Provided | 12 | 16.6 | 21 | 29.1 | 27 | 37.5 | 12 | 16.6 |
| Relevancy of the Information provided | 13 | 18.0 | 20 | 27.7 | 24 | 33.3 | 15 | 20.8 |

As it can be understood from table 4.8. most of the features/facilities of the card catalogs including their arrangements, completeness, specificity and adequacy are judged as 'poor' or 'very poor' by the majority of the users.

The respondents were asked to estimate the average time they spent to identify a single document they want in the library and to indicate their feelings about the time they spent in searching (see appendix I, question number 12 and 13). The obtained responses are summarized and given in table 4.9.

Table 4.9. Estimated Average Time Spent to Identify a Single Required Document Using the Library Card Catalogs and the Feelings of Users about the Time Taken in Searching.

| Estimated Average Time Spent in Searching | Average Time Spent in Searching | | Opinions or Feelings of Users about the Time Taken in Searching. | | | | | |
|-------------------------------------------|---------------------------------|------|------------------------------------------------------------------|------|-------------|------|--------|-----|
| | | | Too much | | Fair Enough | | Prompt | |
| | No. | % | No. | % | No. | % | No. | % |
| Less than 2 minutes | 3 | 4.2 | - | | 1 | 1.3 | 2 | 2.7 |
| 2-5 minutes | 13 | 18.0 | 9 | 12.5 | 3 | 4.2 | 1 | 1.3 |
| 6-9 minutes | 28 | 38.8 | 19 | 26.4 | 9 | 12.5 | - | - |
| 10-15 minutes | 18 | 25 | 15 | 20.8 | 3 | 4.2 | - | - |
| More than 15 minutes | 10 | 13.8 | 10 | 13.8 | -- | -- | -- | -- |
| Total | 72 | 100 | 53 | 73.5 | 16 | 22.2 | 3 | 4.2 |

The 53 (73.5%) respondents who have felt that they had spent too much time in searching were further requested to describe their opinions about the efforts they have made to identify and locate the materials they want in the library. The majority of the respondents pointed out that they make too much effort for IR in the library.

Those 53 respondents who have shown that the searching time taken and effort made is too much were further requested to indicate the major reasons behind their spending too much time and effort in IR. Their responses are given in table 4.10. as follows.

Table 4.10. Reasons for Spending too much Time and Effort in Searching Required Items in the Library Card Catalogs.

| Reasons for Spending too much Time | Responses | |
|------------------------------------------------------------------------------------|-----------|------|
| | No. | % |
| Wrong Bibliographic Information Brought by the Users for IR | 2 | 3.7 |
| Users Lack of Adequate Search Skill or Experience | 5 | 9.4 |
| Absence of Appropriate Access Points Such as Alphabetical Subject Catalogs/Indexes | 46 | 86.7 |
| Absence of Appropriate Cross - References for Related Topics | 41 | 77.3 |
| Absence of Appropriate Guides and Reference Manuals | 35 | 66.0 |
| Complexity of the Card Catalogs or Printed Indexes Entries | 22 | 41.5 |
| Miss-filing and Wrong Arrangement of Card Catalogs/Indexes Entries | 18 | 33.9 |
| Absence of Orientation for Users on How to use the IR Tools | 32 | 60.3 |

Note: The total is more than 53 (those respondents who had felt and indicated that the searching time is too much); hence, more than 100% because respondents had chosen more than one option.

The respondents were asked to rate the ease of identifying and locating different types of the library collection through the existing IR tools/facilities. The responses are provided in table 4.11.

Table 4.11. Ease of Retrieval Rate of Various Types of Library Collections.

| Type of Materials | IR Ease Rate Responses | | | | | | | | | |
|--------------------------------|------------------------|-----|------|------|------|------|-----------|------|----------------|------|
| | Very Easy | | Easy | | Fair | | Difficult | | Very Difficult | |
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Foreign Language Collection | 2 | 2.7 | 11 | 15.2 | 21 | 29.1 | 26 | 36.1 | 12 | 16.6 |
| Ethiopian Languages Collection | - | - | 5 | 6.9 | 18 | 25.0 | 32 | 44.4 | 17 | 23.6 |
| Periodical Collection | 1 | 1.4 | 10 | 13.8 | 20 | 27.7 | 25 | 34.7 | 16 | 22.2 |

As it can be understood from table 4.11. Ethiopian language collections and periodicals are relatively difficult for IR while the foreign language collection, with relatively better and more catalogs/indexes are fairly easy.

4.1.1.4. Frequencies and Factors for IR Success/ Failures of the Users.

The users were inquired to indicate how often they were independently able to identify and locate the document they want by using the existing library IR tools/facilities. The responses are presented in table 4.12.

Table 4.12. Frequency of Users Capability to Identify and Locate the Required Library Resources Independently.

| Frequency of Users IR Success without the Assistance of Library Staff | Responses | |
|-----------------------------------------------------------------------|-----------|------|
| | No. | % |
| Always | 5 | 6.9 |
| Sometimes | 38 | 52.7 |
| Rarely | 29 | 40.2 |
| Never | - | - |

When the respondents were further asked to describe the major courses of actions that they would take after their search fails, the majority of them indicated that they are either obliged to look for assistance from library staff or to quit the searching process since the tools are not easy to deal with. Confirming the library users view indicated in table

4.12. the circulation unit staff members also indicated that the users usually need the assistance of the library staff for identifying and locating the document they want in the library. Due to their low frequency of library use or information skill and research experience, particularly, the senior undergraduate (4th year) students were found to be the ones who needed the assistance of the library staff more frequently.

The library user and staff members had also mentioned various factors for the causes of IR failures of users to identify and locate the required documents. The major ones are:

- Mismatches that occur between user topical/subject approach for searching and the numerical arrangement of the classified subject catalogs.
- Absence or inadequacy of alphabetical subject catalogs/indexes and cross-references provided to related topics or items.
- Filing and typing errors in the card catalogs, printed indexes or bibliographies.
- Multi-format and multi-language interdisciplinary documents had also complicated the processing, storage and retrieval of the bibliographic information of the library collection.
- Lack of appropriate support vocabulary control devices or tools.
- Confusion of users due to more than one document call number on a card catalog.
- Users unfamiliarity with transliteration of local author names and their cross-reference inadequacy and inconsistency, and
- Linear and unidimensional sequential arrangements of author title dictionary catalogs also aggravate the library IR services.

4.1.1.5. Constraints and /or Limitations of the Existing IR

Tools/Facilities.

The respondents were further asked to indicate the major problems they have frequently encountered in IR. Accordingly, various difficulties and constraints of the existing IR tools/facilities were identified and indicated among which the major ones are given in table 4.13.

Table 4.13. Problem Frequently encountered by Users in IR.

| Problems Encountered | Responses | |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------|------|
| | No. | % |
| Absence of Alphabetical Subjects Access | 53 | 73.6 |
| Unawareness of Users about the Existing IR Tools/Facilities | 41 | 56.9 |
| Incompatibility of Users' Subject Search Approaches with the Indirect Subject Access Provision (through the Classified Subject Catalogs). | 45 | 62.5 |
| Transliteration Inconsistency or Ambiguity | 36 | 50.0 |
| Translation Problems of Document Contents in Unknown Language | 24 | 33.3 |

Note: The total is more than 72, hence more than 100% because respondents had encountered as more than one problems.

Sometimes, unnecessary bibliographic information is included and the necessary ones were excluded from the existing IR tools/facilities for the user to identify and determine relevant documents on a given topic.

The library staff members had similarly described a number of IR difficulties/problems that inhibit the library services. The main idea is the difficulty due to: document on a given topic is widely scattered under different subject classification numbers on different shelves of various sections of the library.

Among the major problems and reasons that contributed to dissatisfaction of users are:

- Uncertainty of users about where to look or under what class number more relevant documents are cataloged/indexed; and where to find what other related documents in the library.
- There is a wide gap between the user approach for searching, and the provision of the library IR tools such as card catalogs. Users often prefer to search by their research topic or alphabetical subject headings/entries while the classified subject catalogs are given in numerical arrangement with a very broad topics.
- Moreover, the circulation staff attributed IR difficulties to the complexity and ambiguity of user information needs (i.e. not clearly and specifically expressed information requirements of users). Some of the library users want further guides and exploration to reach the right and actual information needs for identification of relevant documents.

4.1.1.6 Satisfaction of Users with the Existing IR Tools/Facilities.

The respondents were asked to indicate the degree of their satisfaction with the existing IR tools/facilities of the library for which responses presented in table 4.14 are obtained.

Table 4.14. Degree of Users Satisfaction with the Existing IR Facilities.

| Degree of Satisfaction | Responses | |
|------------------------|-----------|------|
| | No. | % |
| Very Satisfied | 3 | 4.1 |
| Satisfied | 13 | 18.0 |
| Poorly Satisfied | 38 | 52.7 |
| Not Satisfied | 18 | 25.0 |
| Total | 72 | 100 |

As indicated in table 4.14. only 3 (4%) of the library users were very satisfied and 13 (18.0%) of them satisfied with the IR tools. But, 38 (52.7%) of the users were poorly satisfied while 18 (25.0%) were 'not satisfied' with the existing IR practices/facilities. Sharing these views of the users, the library staff members have also indicated that the existing IR tools/facilities are very poor and inefficient mainly due to their obsolescence, in-comprehensiveness and broadness in nature. These tools were not able to cope up with the recently rapidly growing number of information resources and highly increasing IR requirements of their users.

Among the major causes of the poor performance of the library IR services and the dissatisfaction of users, the following are further outlined by both the library users and staff members as follow:

- It takes effort and time-consuming searching processes. Its final search outputs are incomplete or inexhaustive.
- Both library users and staff encounter difficulties and confusion to guess or determine the content of the documents from the existing library IR tools and facilities such as broad subject classification numbers and title of documents.
- Comprehensive subject headings/indexes with adequate cross-references provision to related topics are absent.
- There is lack of uniformity and/or consistency of bibliographic information, including Ethiopian author names and transliterations given in the library card catalogs and other IR tools.

Some users have also mentioned that late finding of very relevant documents for already undertaken and completed research is common at the library.

The respondents were requested to select from a list of various kinds of IR facilities/services, which they wish to be offered in the library. The respondents were also

requested to mark and indicate the IR service(s) they do not know. Their responses are given in table 4.15. in descending order of the number of the user selection or recommendation for the IR facilities/services provisions.

Table 4.15. Additional IR Services/Facilities Recommended

| IR Facilities/Services | Responses | | | |
|------------------------------------------------|-----------|------|---------|-------|
| | Preferred | | Unknown | |
| | No. | % | No. | % |
| Alphabetical Subject Catalogs or Access Points | 46 | 63.8 | - | - |
| Abstracting and Indexing Services | 40 | 55.5 | 3 | 4.1 |
| Computerized (Online) Catalogs | 37 | 51.3 | 5 | 6.9 |
| Literature Search Services | 35 | 48.6 | 7 | 9.7 |
| Online Information Retrieval Services | 32 | 44.4 | 9 | 12.5 |
| Selective Dissemination of Information (SDI) | 26 | 36.1 | 8 | 11.11 |
| Current Awareness Services (CAS) | 23 | 31.9 | 12 | 16.6 |

Note: *The total is more than 72; hence, more than 100% since respondents had chosen more than one option.*

As it can be clearly understood from table 4.15. except for the less than about 17% of the respondents who are not yet aware of some of the additional retrieval services, the majority of the library users have already recognized the importance of various additional IR facilities and services, including online catalogs, selective dissemination of information and current awareness services.

4.1.2. The Computer-Based Catalog Database

This subsection briefly presents and analyses the facts and information obtained from the recently created and launched computer-based catalog database of the library called 'FORCLN', (of foreign collection catalogs). Most of the facts and/or data gathered on the assessment of this database were gathered through discussion with the responsible library staff and through various visits and observations made on the IR functions and facilities of this in-house catalog database.

As it was noted earlier, 'FORCLN' database is mainly used for handling in house bibliographic information or the library foreign language collection catalog records. The database is developed using the functions and facilities that are provided by Micro-CDS/ISIS software. These major IR functions and provisions of the software include various facilities for data entry, storage, search, retrieval, and search result printing or displaying the required record out of the database. Here we will briefly consider and try to assess these IR facilities and provisions of FORCLN database.

The first and basic function that any IR database system is required to do is to allow the user to store the desired data/information. CDS/ISIS has various facilities for this. For the purpose of capturing and storing the library catalog data, a Field Definition Table (FDT) and a Data Entry Worksheet (DEW) were created and used by the database. The (FDT) is a table that defines the record fields and their characteristics of the database. It determines the number, type and size of the data elements (i.e. record fields) that can be recorded about the library holdings/documents. The (DEW) is a type of electronic form to be used by the data inputting personnel to enter or code and edit the values of each and every field defined in the FDT.

Although it is possible to define and create as many DEW as necessary, FORCLN has only one major and comprehensive but a bit complicated user defined worksheet called by the database name (i.e. FORCLN). Due to the absence of additional and appropriate DEW for the diversified holdings of the library, data entry personnel usually encounter difficulties in distinguishing the bibliographic fields of one type/format of document from another. For instance, multi-volume monographs catalog entries and their individual article catalog (analytical) entries fields identification and definition is very confusing and difficult for new and inexperienced staff members.

As it was explained by the interviewee and also observed during the visits made, the database has about 26 bibliographic fields for description of a document among which

some of the fields are only required and unique to certain types of documents. In addition to these bibliographic fields, there are about 12 fields that are related to physical identification of document and its actual location in the library. Based on the various characteristics of bibliographic data element, some of these fields are repeatable and/or sub-fielded. Usually, the fields are tagged with a minimum gap of 5 between the bibliographic fields.

In response to the question as to why and how the database was developed, the interviewee pointed out that the database was mainly created to support the manual cataloging processes of the library, practically for card catalog and printed index production. There was no formal study made to assess the existing manual IR limitations and the library user requirements for introducing and developing the database. This means that the database was not designed and developed based on the IR requirements of the library users and staff. Currently, the catalog database doesn't give formal bibliographic search services. However, sometimes it offers limited catalog record search services for the IES research staff members. The reasons given by the interviewee for the inaccessibility and incapability of the database to provide formal online catalog IR service were its lack of well developed and adequate catalog records and the shortage of skilled manpower, as well as lack of adequate computing facilities.

Among the various types of library collection card catalog production, the multi-volume monographs such as symposium and conference proceedings are given a priority to be handled by this computer-based catalog database. This is due to the fact that production of the card catalogs of these multi-volume document articles (called analytical catalog entries) are too many and routine to be handled manually by a type writer.

Responding to the inquiry about the IR features and facilities of the database, the interviewee said that the basic IR facilities provided by the CDS/ISIS software described in section 2.1.4. are mainly used by the database.

Another question was also raised to identify and determine to what extent the limitations of the manual IR system elevated by the introduction and development of the database. The interviewee indicated that almost none of the major problems were tackled. The major limitations of the existing IR system including lack of appropriate vocabulary control devices; transliteration guide and user reference guides have been indicated. Indeed, the database does not improve or replace any of the manual IR practices and facilities of the library except just supporting them.

The other question forwarded in the interviewee was related to the IR options and facilities provided by the database and level of their user friendliness. The interviewee indicated that except for Fields Select Table (FST) and three Display Formats designed by the database developers, its IR features and facilities are basically based on the provisions of the CDS/ISIS software.

These include search facilities such as referring search strategy (using or changing Boolean operators), changing the scope of different terms, using proximity, free text and range search strategies and dictionary term browsing, searching and retrieving the database records. The database is relatively complex for most of the library staff due to its lack of online help and thesaurus facilities to guide the users in IR.

The search performance of the database largely depends on user search skill and experience with ISIS facilities. It is important to note, therefore, that the IR search formulation facilities of the database are not user friendly and hence do not satisfy most of the IR requirements of the library. Regarding the search result display facilities, as indicated earlier, the IR functions in which CDS/ISIS requires some user effort and gives the opportunity to create online display formats for presenting the search output. In this regard, three display formats called FORCLN, TITAD and ANALY were developed and used for displaying main entry and added entries of catalog records of the database and for their card catalog printing or production.

4.2. Discussion and Implications of the Findings

This section presents the discussion, interpretation and summary of the findings based on the data presentation and analysis that were given in the preceding two sections of this chapter. In some cases, the discussion or interpretation of the findings is supplemented by information obtained through observation related documents, as well as personal experiences, the researcher being a staff member of the library.

The main purpose of this discussion and summary of the research results is to determine and indicate the major limitations of the existing IR practices and facilities of the library with a view of exploring and identifying alternative mechanisms and tools for improvement.

Accordingly, the discussion and interpretation of the findings of both the manual and the computer based catalog database IR practices and facilities of the library will be provided in the first section (section 4.2.1). Finally, a summary and implications of the study results are offered, highlighting and briefing the major limitations of the existing IR system.

4.2.1. Discussion

Alternative IR mechanisms and tools are then considered and suggested based on the requirements of the library users and staff to improve the existing IR services.

This section discusses and elaborates the facilities data presented and analyzed in the two preceding sections (sections 4.1.1 and 4.1.2) in line with the objective of the study. Accordingly, the survey findings of the existing IR practices and of the library are explained and interpreted along the following points.

1. Nature, usage and accessibility of the existing IR practices and facilities

2. Effectiveness, efficiency and adequacy of the IR tools/facilities
3. Factors or causes of the IR failures and dissatisfaction of the library users
4. Major limitations of the existing IR practices, tools and facilities, and
5. Alternative IR tools and mechanisms suggested and proposed for the improvement of the library IR services

4.2.1.1. Existing IR Practices and Facilities of the Library: Nature, Usage and

Accessibility

a) **Nature and Patterns of the IR Practices and Tools/Facilities**

As the data given in section 4.1.1.1. reveal, the existing manual and traditional approaches and facilities that are predominantly practiced and used at the IES library are found to be not only inappropriate and inadequate but also inefficient and ineffective. The conventional and general classification schemes such as DDC and cataloging guides and rules, like SLSH and AACR2 etc. severely fail to meet the IR requirement of the library. Most of the specific notations, headings or topics and guides that are required for the representation and retrieval of the diversified local and special collections of the library are not covered and accommodated in these general and conventional IR tools. These limitations of the IR tools/facilities are also hold true for the Ethiopian Collection Department of the AAU library.

Certain but very limited efforts were made to modify and adopt these general classification schemes and cataloging guides. The broad library classification guide and thesis and research article cataloging reference handouts are the notable ones. The transliteration guide of Ethiopian Studies is also used for local author name transliteration of the catalog entries.

However, since the adoption and modifications of these classification and cataloging tools were not done on the basis of the library user and staff IR requirements, all of them lack comprehensiveness, specificity, simplicity and consistency in their notations and guideline provision. In spite of their inadequacies, inefficiencies non-standardization and lack of being properly designed structure for in-depth classification and cataloging of the library collection, the tools have never been revised and updated to meet the rapidly growing library resources and their users requirements for IR. One of the reasons given for the obsolescence and inappropriateness of the adopted classification guide is the absence of relevant and complete subject headings for Ethiopian Studies. The coverage, hierarchies and structures of major topics of Ethiopian Studies are not yet established.

Generally speaking, the inefficiency and inadequacy of the existing IR practices and facilities of the library for representation and the retrieval of relevant and related documents are the major limitations of the library IR services. The classification, cataloging and searching activities and procedures are becoming inconvenient and incapable. They do not match with the library staff, and user approach for searching and retrieving information. There are also found to be very tiresome and routine. Most of these inefficiencies and deficiencies are resulted from the absence of appropriate and effective vocabulary control devices that can support and serve both the library staff and users in information storage and retrieval.

Since it was designed and developed without assessing and considering these limitations of the manual IR system and the requirements of the library users, the computer-based catalog database also fails to tackle most of the current constraints of the IR practices and facilities. Indeed, in its current state, the catalog database is not in a position to overcome most of the existing IR shortcomings.

bibliographic reference materials are cataloged and kept in the library stack like other documents with the assumption that users can identify and use them through the card catalogs. However, as it has been evidenced above, these IR tools are not familiar and accessible to most of the library users.

The majority (58%) of the users had also indicated that recent materials are less timely accessible while 32% of them had shown that such current materials are not timely accessible at all. Evidencing this, the technical processing staff members had also mentioned that, due to the existence of unprocessed documents backlog, to complete the classification and cataloging of a given document takes 4-6 months on average. The users had further stated that even if certain recent materials are cataloged and arrived at the circulation unit duly, since their catalog cards are inter-field with the existing very cumbersome library card catalogs, the tracing and identifying a current relevant document is very difficult. Consequently, Ranganathan's fundamental library science laws which indicate users should have readily and timely access to the library resources are not yet implemented and practiced in the IES library. This lack of timely access to the current materials and library resources has resulted in not just frequent duplication and wastage of research efforts but also poor quality and a delay of research outputs.

Furthermore, as illustrated in table 4.11. only less than 15% of the users had indicated that they could easily access the various types of the library collection. But 25-30% of the users had indicated that it is fairly difficult, while the majority (50-60%) of the users had shown that accessing the required items in the library is difficult or very difficult. Periodicals and Ethiopian Languages Collections are found to be relatively more difficult for accessing or searching due to their lack of separate and adequate catalog records or card catalogs. It has been discovered that about 90% the Ethiopian languages collections are not yet completely classified and cataloged because of their unique nature, shortage of manpower, and lack of appropriate and efficient IR tools for their technical processing.

4.2.1.2. Effectiveness Adequacy and Efficiency of the IR Tools/Facilities

As shown in table 4.6., most of the IR tools/facilities do not effectively serve their users. Nearly 60% of the users had judged and considered most of the retrieval tools, including card catalogs and printed indexes as 'less' or 'not' effective. The assistance of the library staff are judged better since they are considered as very effective and effective by nearly 17% and 43% of the users respectively. The major factors of the ineffectiveness of the IR tools/facilities are their inexhaustiveness in providing bibliographic information their lack of specificity and simplicity.

In spite of their ineffectiveness, due to their relatively better accessibility and search ability (indicated in the proceeding section), the library card catalogs are more frequently and predominantly employed for IR by almost all of the library users. The three major access points (entries) of the card catalogs (i.e. document author, title and call number) are averagely rated by about 74% of the users as (very) useful and important, (refer to table 4.7).

More specifically, the respondents were requested to judge the various bibliographic features and facilities provided in the library card catalogs, (refer to table 4.8). The adequacy of access points, cross-references and guides, together with the relevancy, accuracy, specificity and completeness of the bibliographic information in the card catalogs were judged poor or very poor by 75% of the users on average. Similarly, the convenience (or ease of usage) and compatibilities of the card catalog access facilities with the users search preference or approach were also considered as poor or very poor by more than 50% of the users. Only about 10% and 30% of the respondents had respectively shown that some of the card catalog features and facilities are very good and good.

Although they are the notably major means and mechanisms of accessing the library resources, the IR facilities of the library card catalogs are currently performing ineffectively and inadequately. Moreover, almost all of the library users and staff had recognized and considered the absence of direct topical or alphabetical subject accesses and guides as the major shortcomings of the library catalogs. Thus, incorporation of the subject catalog indexes and guides into the library IR tools/facilities has been strongly recommended for the improvement of the existing IR system. On the other hand, as it has been discovered through the review of related literature (see chapter 2, section 2.1) and also confirmed by the library staff, preparation incorporation of document subject access or content descriptors into the library IR tools/facilities IR is very difficult and not feasible unless appropriate vocabulary control devices such as thesaurus are developed and established to serve both the library staff and users. Thus, development and availability of vocabulary control devices like thesauri that can be employed for representation and retrieval of the library holdings is an essential prerequisite for preparation and compilation of subject catalogs, bibliographies and indexes.

Other problems that are encountered in using the three card catalog entries include varieties of author names and inconsistencies of their transliteration, misleading words of titles for document contents, broadness and obsolescence of the library classification guide coverage and headings. This also clearly indicates that revision, updating and development of standard and adequate transliteration and classification guides are required to tackle these problems and to improve the library IR services. The availability of a comprehensive and appropriate thesaurus or subject headings (guides) on Ethiopian Studies can also considerably facilitate the revision and updating of the library classification guide, as well as indexing and abstracting services.

Regarding the estimated average time the library users spend in searching and browsing the card catalogs to identify and locate a single required document, only 4% of

the users had indicated they spent less than 2 minutes which was considered as prompt and fair searching time (please refer to table 4.9). About 18% of the users had shown that they spend 2-5 minutes among which 12.5% of them felt that it is too much time. Nearly 39% of the users spent 6-9 minutes out of which 26.4% thought that it is too much time to be spent for searching a single document. About a quarter (25%) of the library users spent 10-15 minutes almost all (21%) of who had shown that the time taken during searching is too much. The rest of the 14% of the users had indicated they spent more than 15 minutes to identify and locate a single document they want in the library which they consider as an extremely too much searching time.

Totally, about 73% of the library users had indicated that the time they spent for searching required documents in the library is too much. The majority of the users had also described that the effort they spent during searching is also very great and too much. Here, it is important to note the fact that contrary to most of the requirements of IR systems to save the searching time and effort of users, the majority of the IES library users have usually spent too much time in IR. They also made a great deal of efforts for searching the documents they want in the library.

Among the reasons that accounted for the too much time and effort in searching, around 70% of the users had pointed out that inadequacy and lack of appropriate access point, such as subject headings, cross-references and guides are the major ones (refer to table 4.10). Complexity of the card catalogs and users' lack of sufficient and regular orientation were also identified as significant factors of inhibiting and delaying the searching process.

4.2.1.3. Limitations of the Existing IR Tools/Facilitites and Sources of IR

Failures or Dissatisfaction of Users.

Confirming most of the constraints of the IR tools/facilities mentioned earlier, 68% and 52% of the users had respectively indicated that lack of direct and specific subject access points and absence of formal and regular user orientation are the major deficiencies of the current IR services of the library. The problems associated with Ethiopian name transliteration, and language translation services are additional limitations of the library IR system, (refer to table 4.13).

The data obtained on the frequency and ability of the user IR success by using only the existing retrieval tools/facilities further reveals the deficiencies and ineffectiveness of the IR system. It shows that independent user searching and retrieval attempts are usually unsuccessful or frequently fail, (refer to table 4.12). Only 7% of the users have indicated that they can always independently and successfully identify and locate the document they want in the library. Most (52.7%) of the users have shown that their own attempts to identify and locate required and relevant library resources usually fail. Thus, they frequently look for the assistance of the library staff. Very significant percentages (40%) of the users have indicated that their own independent IR success is very rare. Thus, they always need the assistance of the library staff for identification and retrieval of required information sources.

The factors obtained through the discussion held with the library staff have also confirmed the frequent IR failures of the users and extensive assistance that are required from the library staff to facilitate the searching and retrieval of required and related documents. The senior undergraduate (4th year) students were found to be the user group who needs more and frequent assistance from the library staff members due to their relatively less search experiences and skills. Most of the circulation staff members had

also complained that there is very high work load resulting from the inefficiencies and ineffectiveness of the IR tools/facilities of the library. Without the assistance of the library staff, the IR tools/facilities are not in a position to effectively support, guide and enable the users to successfully identify and locate relevant and required library resources.

Consequently, as it was indicated in table 4.14. the majority (53%) of the users have indicated that they are poorly satisfied while a quarter (25%) of them pointed out that they are not satisfied with the current IR tools/facilities of the library. The rest, about 22% of the users, are relatively satisfied with the existing IR tools/facilities of the library.

Generally, the major deficiencies of the existing IR tools/facilities (failures and dissatisfactions of the library staff and users with the current IR services) of the library are:

- Complexity and inaccuracy of information provided or required for IR: Various identification and location codes or numbers are inconsistently recorded either at the back or front pages of the card catalogs, or provide overloaded and redundant document bibliographic information required for identification of some of the interdisciplinary and multi-volume materials. For instance, the catalog records of certain documents are often prepared on more than one card catalog, which are assigned to more than one call number. This results in confusion. The users and staff fail to distinguish the call number, which actually tells or locates the position and the place of the required document on the shelves.
- Difficulty and complexity for subject cataloging/indexing and therefore to make a comprehensive literature search on given a research topic in the absence of appropriate subject guides and cross reference for relevant and related documents in the library.
- Broad, long and misleading classification notations or guide topics and document title catalog entries in indicating the actual contents of documents complicate matters. Due to the absence of detailed subject catalogs and indexes, the identification of a relevant and specific document on a given specific topic is very difficult.
- Varieties of forms of author names and spellings of local place and Ethiopian names and their transliteration inconsistencies that are provided without appropriate cross references. Thus ambiguities have significantly contributed to the IR failures and dissatisfaction of users with existing IR system
- Routine, time and effort consuming IR practices or process result from one or combination of the above constraints, which leads to lack of timely access to the library resources.

Various and important IR facilities and/or services, (see table 4.15), had been suggested for tackling most of the shortcomings of the existing IR practices and facilities need to be improved. The majority of the users have recommended the following.

- Preparation and provision of various subject access facilities, including subject catalogs, indexes, abstracts and bibliographies of the various library resources. The effective preparation and compilation of these additional and improved information access mechanisms and facilities need, as essential prerequisites, the construction and development of local IR demand based vocabulary control devices, like a thesaurus. Indeed, this is very vital for an efficient document content analysis and its translation into standard and appropriate subject headings or descriptors that can provide the users with more opportunity of relevant material identification and retrieval on their research topics.
- Computerized IR facilities/services including online catalogs as well as literature search and/or retrieval services had been strongly recommended by the majority of the users.
- Selective dissemination of information, current awareness and other related services had also been preferred and suggested by a number of researchers to be launched at the IES library to facilitate R & D activities on Ethiopian Studies.

Recognizing these preferences and recommendations of the library users, the next subsection provides a summary of implication of the study results.

4.2.2. Summaries and Implications of the Findings

The current performances of IR practices and facilities in the IES library are found to be neither efficient nor effective. They are not in a position to meet the user IR requirement. The existing classification and cataloging and searching tools/facilities of the library are very traditional or conventional. They are broad for representation and retrieval of most of the local and Ethiopian collection of the library. The limited, yet not properly adopted, classification and cataloging guide manuals of the library have never been revised and updated to meet the rapidly increasing information sources and their users IR requirements. Particularly, the library classification and classified subject catalog guide (use by both catalogers and user) is too broad and inadequate for effective arrangement and retrieval of library holdings. Besides its too broad and old headings, the collection of the library has not only a wide range of formats, languages and interdisciplinary fields but also requires more specific topics and subject headings (access points) for searching.

Given these inefficient and ineffective IR tools/facilities, the technical processing and retrieval of the library resources are becoming very tiresome and time consuming. This results in frequent IR failures and dissatisfaction of the users with the current IR services of the library.

Complexity, inconsistency and in-comprehensiveness of the existing bibliographic information provided in various retrieval tools, including the card catalogs, are also among the major factors that inhibit the library IR services. A number of users have also been dissatisfied with the library IR system due to the lack of readily and timely accessible IR tools/facilities and current collections of the library. Above all, absence of appropriate and specific subject access mechanisms and tools to the very wide and rich resources of the library are accounted as the major shortcomings of the library IR system.

The majority of the library users usually prefer approaches to access or search the library resources through their own actual and specific research problem and subject matters or content representatives of documents. Such a direct and alphabetical subject access facility is however, not yet available in the library. This is mainly because of the lack of appropriate subject headings or vocabulary control device. As it has been indicated in the previous sections of thesis development and availability of appropriate vocabulary control device like a thesaurus is important for preparation and provision of effective subject access facilities including subject catalogs and indexes. Besides the lack of adequate awareness for the problems that have resulted from the absence of such subject access facilities, the non-existence of appropriate and effective vocabulary control devices, such as thesaurus on Ethiopian Studies are accounted for the unavailability of subject catalogs, indexes and bibliographies, the need to be designed and developed local users demand based and suitable vocabulary control devices like thesaurus which can provide important and standardize terms for documents content representation and retrieval purposes. Undoubtedly, the necessity of such IR tools proves (one of the specific

objectives of the study) for designing and building a prototype computer assisted thesaurus database on Ethiopian Studies so as to serve both the library staff and users for IR.

On the other hand, though the commencement of the computer-based catalog database has been favored and could have a great potential to facilitate the library IR services, currently it also shares and suffers from most of the manual IR limitations. These include, lack of appropriate subject headings or thesaurus, online helps, transliteration guide and other user-friendly search interfaces and browsing facilities. Thus, the database also needs the development and incorporation of various advanced and improved IR tools/facilities including an online thesaurus for effective searching and retrieval of relevant information sources in the library.

In general, the results of the study have a strong and direct implication for the development and establishment alternative IR tools/facilities to meet the IR requirement of the users, by overcoming or minimizing the existing shortcomings of the library IR services. Indeed, the need for developing and launching various improved IR tools and mechanisms including a thesaurus, SDI, CAS and other modern IR facilities and services in the library to facilitate and services in the library to facility the access and utilization of its resources. However, a simultaneous development of these IR tools/facilities is not feasible in an academic exercise of such a short period duration. Thus, one of the strongly recommended IR tools, i.e. the development of a preliminary and prototype computer assisted database thesaurus is finally considered and proposed in this study. Accordingly, the next chapter introduces the general techniques and procedures used for, and feature of the prototype thesaurus database called 'IESLT' briefly.

CHAPTER FIVE

THE PROPOSED IR TOOL: A PROTOTYPE COMPUTER- ASSISTED THESAURUS DATABASE

As it has been discussed in the previous chapter, inadequacies and inefficiencies of the existing IR practices and facilities of the IES library have been found to be the major constraints of its IR services. Thus, the need for exploring, identifying and developing improved alternative IR tools and mechanisms have become unquestionable and strongly recommended by both the library users and the staff. To this end, this chapter introduces and demonstrates a prototype computer-assisted thesaurus database called 'IESLT' briefly.

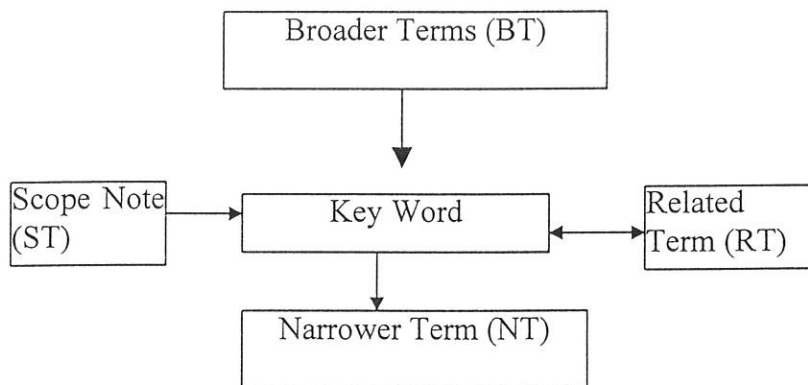
5.1. The Role of Thesaurus in an IR System

As indicated (section 2.1.3.3) the use of free language terms for IR have advantages. They are direct, more current, and have the capability of exhaustive coverage, and so on. However these virtues are offset by weaknesses. A burden is placed on the user (searcher) to think of synonyms, or of generic and related terms. The strengths of controlled indexing language like the thesaurus compensate for these natural language weaknesses, easing the burden on the user during searching by controlling synonyms, qualifying homographs, providing scope notes and displaying conceptually related terms or topics for extending the search and comprehensive IR purposes. The thesaurus can also express concepts elusive in a free text. It has the quality of predictability which is lacking in natural languages. Particularly, in research and academic information centers, like the IES library, where the users prefer to search by their research topics, where there is no appropriate vocabulary control device to be used for searching, cataloging or indexing, the development of IR tool, thesaurus is very important for effective IR services (Dosset, 1992).

The use of appropriate and standard thesaurus brings the vocabulary of the searcher into coincidence with the vocabulary of the catalogers/indexers. It relates various terminologies in the subject literature and submitted user query terms to the IR system thus minimizing or preventing users from missing relevant documents.

A good thesaurus helps the cataloger/indexer in the comprehension of the subject matter by suggesting and providing leads to the most precise, accurate, and appropriate descriptors/index terms. In so doing, it helps to extend the subject knowledge of the indexer. With regard to search, a thesaurus can facilitate the selection and location of correct and related subject headings or index terms to which the appropriate and relevant classes of documents belong. It also gives clues to a better search formulation for the retrieval of the maximum number of relevant documents. Figure 2. shows the semantic relationships that exist among the thesaurus terms.

Figure 2. Semantic Relationship among Thesaurus Terms, (Adopted from Pao, 1989:119)



Based on the finding of the survey and considering the role of the thesaurus in IR together with future plan of the library automation, this study also proposes and demonstrates a preliminary and prototype computer-assisted database called 'IESLT' on Ethiopian history. This prototype thesaurus database has been developed in order to

demonstrate the need and significance of designing and constructing a thesaurus that is based on subjects of the local collections and IR requirements of the IES library users. The discipline of Ethiopian history and its English terms/topics were chosen for constructing this preliminary thesaurus database since they have relatively a large number of volumes of collection and users in the library.

5.2. Planning and Designing the Thesaurus Construction

5.2.1. Definition of the Subject Field.

The first activity in constructing the thesaurus is to define its subject field. Such a definition is usually indicative of the “scope” of the subject field that constitutes its core areas. But on many occasions, a need may arise to recognize the peripheral areas of the subject field because of their intimate relationship with the core areas. Thus, the boundary of the subject coverage of a thesaurus including both central and peripheral fields, should be distinguished and determined for the design and development of thesaurus.

Accordingly, Ethiopian anthropology, sociology, history and languages are the core areas of Ethiopian Studies while Ethiopian geography, politics, economics etc. are peripheral areas of these subject fields. Peripheral areas do not usually warrant depth treatment in the thesaurus. However, since these core and peripheral areas of Ethiopian Studies are still too wide to be covered in the currently developed prototype thesaurus database, its scope is limited only to certain major topics and English terms of Ethiopian history.

5.2.2. Decision on the Characteristic Layout of the Thesaurus

A thesaurus is mainly used for the representation and retrieval of information within a given IR system. Thus, the compilation of a thesaurus should follow some systematic ways to cover its overall structure and coverage. The phrase ‘Thesaurus characteristics’, comprehends a number of attributes of a thesaurus. Among these, the major attributes are:

1. The specific purpose to be served by the thesaurus: the provision of adequate and appropriate thesaurus terms for in depth indexing, and specific items for searching library resources. The prototype thesaurus database (IESLT) is proposed to serve these basic purposes.
2. The language of the thesaurus: this involves decision on whether to incorporate (use) monolingual or multilingual terms, controlled language only, natural language alone, or a hybrid system for the construction of thesaurus. For the development of the IESLT thesaurus database, English terms or vocabularies that are frequently used in some Ethiopian history literatures and often preferred and inquired by the users of the library for searching are employed based on the registered users queries and library staff experiences. Obviously, the development and employment of a multilingual thesaurus including Amharic, English, Italian etc., may be more appropriate and required for Ethiopian Studies. However, due to the limitation of various resources, including time, the language coverage of the database is limited to English, the language of publication of most of the library holdings.
3. The other important features of the thesaurus include features such as degree of specificity of the descriptions, use of compound terms, use of precision and recall devices. Yet, at this initial stage, no attempt was made to cover all the specific and detailed terms required for the IR in the library.

4. The mode (form) of presentation of the thesaurus terms graphical, systematic display, or an alphabetical display. Alphabetical and systematic display is preferred to present the sample of the IESLT database thesaurus terms given in section 5.3.

5.2.3. Decision on the General Approach to be Used.

There are two approaches to be used in a thesaurus construction. One is based on the deductive (top down) method used for constructing the thesaurus when sufficient number of terms have been collected. In the course of using the other inductive (bottom up) method, terms encountered in the subject literature and user queries of (search terms/topics), the IR system is mainly used and included into thesaurus gradually. In such a case, also adopted and employed for the prototype computer-assisted thesaurus database, vocabulary control is applied from the beginning. Therefore, the significant and most frequent subject terms used in the literature and IR user system are collected, selected and incorporated into the IESLT thesaurus database as soon as they are encountered.

The thesaurus terms are gathered and then similar terms are grouped together, thus identifying the major aspects or facets of the field. These facets are then subdivided, not according to theoretical principles but in a way that comfortably and logically accommodates all the terms that have been collected. Terms within each broad category are analyzed in relation to the other terms in the category to reach upon structured patterns of the thesaurus terms. Based on the topics (subjects) covered by Ethiopian history, the thesaurus database terms are organized into main categories in order that the selected terms can be sorted out and filed under their appropriate headings on the basis of the bottom up approach.

5.2.4. Techniques and Procedures used For Collection, Selection and Structuring of

Terms

After defining the subject field decision approach to be used for the thesaurus, the assembling of terms should follow. Two combined major sources for the collection of terms are employed here.

1. **The literacy warrant or bibliographic warrant:** relevant and related terms are collected from existing glossaries, indexes, classification schemes and subject headings related to the subject filed. In addition to these major sources, ongoing and completed research topics and proposals submitted and available on Ethiopian Studies also had been used as a source of the thesaurus database terms.
2. **The user warrant:** Terms frequently used by the information center patrons for IR are also collected and used for the thesaurus construction. For this purpose, users query registration slip and user interview methods were employed as means of collecting. Thus, both of these approaches are used in combination for developing the prototype thesaurus database. The sample terms that are selected from the major topics of Ethiopian history mainly consist of nouns and noun phrases of various entities, events and abstract concepts.

The records of selected terms were first kept on 'term card' and then recorded in machine readable form (data entry worksheet) defined and designed for inputting the record of the thesaurus into computer database. The data items or record fields include descriptor (USE), definition of scope notes (SN), synonyms (UF), hierarchical relationships (BT/NT) and associative relations (RT). In addition, a class number of a code for major terms or subject headings is also included.

The 'term card' or 'work sheet' employed for the thesaurus term collection is given below.

Descriptor _____

Notation or Code for broad subject heading: _____

Scope Note (SN): _____

Synonyms (UF): _____

Broader Terms (BT): _____

Narrower Terms (NT): _____

Related Terms (RT): _____

The meaning of each descriptor would be understood through the scope note provided whenever appropriate. The terms under each descriptor are arranged in block form to clearly portray the hierarchy and relationships among them. Under each descriptor, a notation is given in order to indicate its position in the systematic part of the thesaurus (subject category).

The instruction to use another term is indicated where a true synonym exists; or when a term is considered to be too specific for inclusion in the thesaurus as a preferred term, and the user is directed to a generic term. The Broader Term (BT) and Narrower Term (NT) relationships in this thesaurus are either whole/part relationships. Accordingly, only one hierarchical chain is used for the thesaurus database.

On the other hand, associative relationships are indicated by the symbol RT. This relationship is not hierarchical. It guides the user to a related term where the underlying concept may be of interest.

5.3. Thesaurus Database

The computer assisted thesaurus database 'IESLT' (the IES Library Thesaurus) was developed using the CDS/ISIS software and its 'THES' sample program. It contains various terms on the major topics of Ethiopian history. It is one of the core disciplines of Ethiopian Studies.

Currently, about two hundred terms have been included in the prototype thesaurus database. Of these, 86 terms are descriptors or USE terms. The rest of the terms are lead-in terms or USE FOR (UF) terms. Accordingly, a database with the following Field Definition Table (FDT) is created to store the records of thesaurus terms.

| Tag Number | Name of the field | Length | Type of field |
|------------|---------------------|--------|----------------|
| 1 | Descriptor (USE) | 50 | X |
| 2. | Scope Note (SN) | 200 | X |
| 3. | Synonyms Terms (UF) | 300 | X (Repeatable) |
| 4. | Broader Terms (BT) | 300 | X (Repeatable) |
| 5. | Narrower Terms (NT) | 300 | X (Repeatable) |
| 6. | Related Terms (RT) | 300 | X (Repeatable) |
| 7. | Term Code | 15 | |

A very broad hierarchical structure of the major areas/topics of Ethiopian history and alphabetical display of sample terms that are covered by the prototype database thesaurus is shown in figure 3 and figure 4.

Figure- 3. Tree Structure Display of the Terms of the Prototype Thesaurus Database.

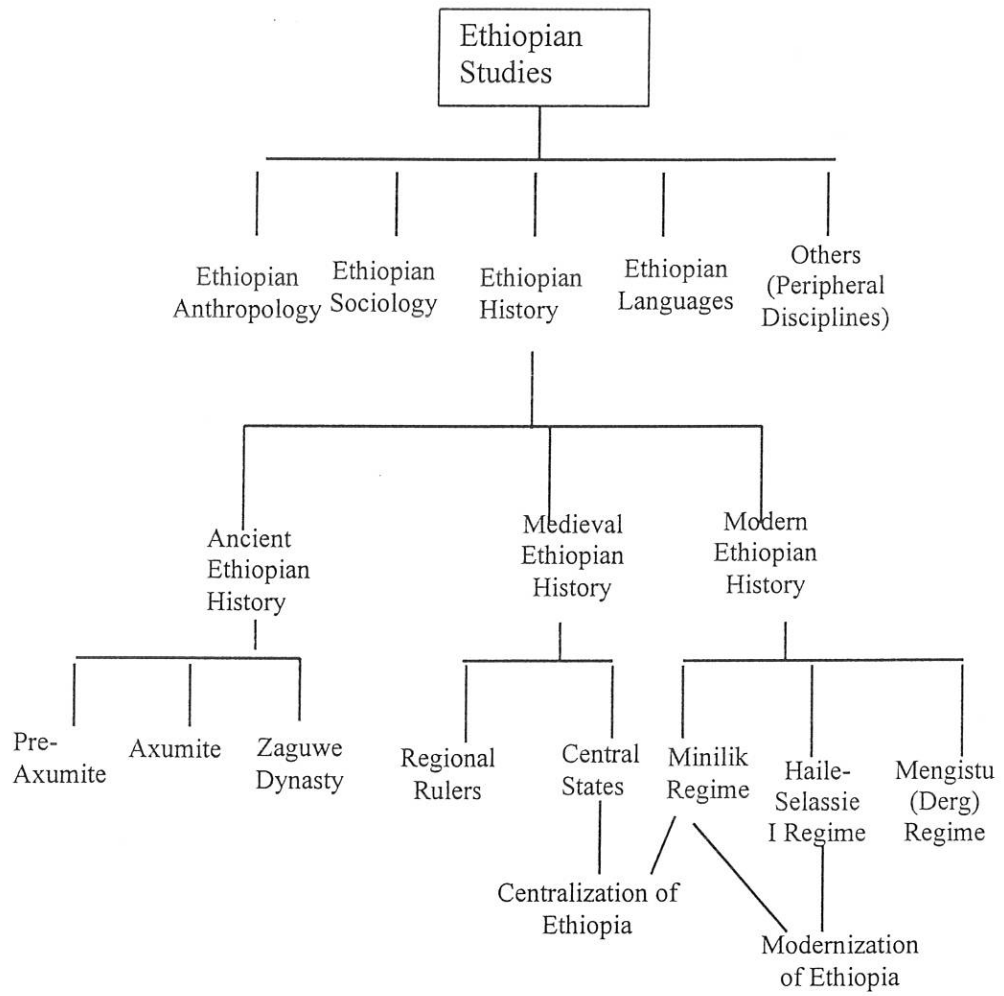


Figure 4 Sample Thesaurus Database Output

Alula Engida

SN: Governor of Tigray and War Leader at the Battle of Dogali in 1887.

UF: Alula Abanega
Son of Qumbi

RT: Dogali Victory
Battle of Dogali
Battle of Adwa
Ethio- Italian Conflict (1887)

Battle of Metamma

SN: A Battle between Ethiopia and Sudanese Mohadist in 1989

UF: Matamma Battle

BT: Ethio - Sudan Conflict

RT: Mahadists Victory
Death of Emperor Yohannes IV

Emperor Tewodros II

SN: Emperor of Ethiopia During 1855-1868

UF: Dajazmach Kassa Hailu
Kassa Maru

RT: Meqdala Expedition
Meqdala Campiagn
Religious Policy
Reformation Policy

Ethiopian History

SN: Historical Study of Ethiopian Nations From Ancient Period to the Present

UF: Absinian History
History of Ethiopia
History of Abisinia

BT: Horn of African History
Eastern African History

NT: Ancient Ethiopian History
Medieval Ethiopian History
Modern Ethiopian History

RT: Ethiopian Social Anthropology
Ethiopian Culture
Ethiopian Nationas

Maqdala Campaign

SN: A Battle Between Emperor Tewodros II and British Expeditions in 1868

UF: British Expeditions in Ethiopia

Napier Expeditions
Meqdala Battle
Battle of Meqdala

RT: Battle of Aroge
British Prisoners in Ethiopia
British Captives
General Napier
Emperor Tewodros II
Death of Emperor Tewodros II

5.4. Maintenance and Development of the Thesaurus

Using CDS/ISIS software, a thesaurus can be built in two ways. One way is to enter each term along with all its relations, each recorded into the thesaurus database. Alternatively, the 'THES' program that comes with the CDS/ISIS software and its modified version at SISA was used to build the thesaurus terms. This modified program has also been used for online maintenance and display of the thesaurus terms of the database. The program allows performing the following three major functions:

1. Addition of a new term to the database;
2. Deletion of a relation or a term from the database
3. Selection and displaying of term(s) from the thesaurus database for formulating a query.

Thus, the program makes it possible to add or delete new terms and relations in the correct alphabetical sequence; and to make all reciprocal entries automatically. To accomplish most of these functions, the user should first run the program by choosing option "A" from the main menu of CDS/ISIS. For the details of the options and provisions of the program, the user may refer to the sample program description and guides provided in the Unesco (1989) CDS/ISIS software reference manual.

The future maintenance and development of this prototype thesaurus database is mainly the responsibility of the library management and staff members.

5.5 Operational significance and use of the Thesaurus database

Provided that it is fully developed and implemented, the prototype thesaurus database could be used for facilitating both cataloguing/indexing and in searching/retrieving documents on Ethiopian History. In the process of subject cataloging or indexing as well as searching the library catalogs, both users and staff members could browse the database (or its print handouts) to identify and assign appropriate subject descriptors or headings needed for representation and retrieval of the contents of the various library collections. Representing the contents of a document may be used for formulating a query to retrieve the required and related documents. Thus, the development and employment of a thesaurus database has a great potential capability to overcome or minimize the incompatibility between the cataloguing/indexing practices or catalogs/indexes retrieval facilities and the user topical/subject search approach. Moreover, further investigation, refinement and development of the 'IESLT' can efficiently improve the technical processing services of the library by providing the catalogers/indexers appropriate guide line and relevant Ethiopian Studies important topics used for documents content representations.

5.6 Checking with the subject Experts and Informal Testing of the Thesaurus

Database.

Certain Subject experts from Department of History and the IES Researchers (of AAU) have been consulted during all the stages of the thesaurus construction. Approval of the experts was obtained on the structure and the hierarchies of the thesaurus terms.

Since these preliminary prototype thesaurus database is not yet fully developed and constructed, to test the database formally is very difficult. Thus, informal discussions made with the technical processing staff of the library and some scholars from whom an encouraging and positive feedback were obtained about the validity and significance of the thesaurus database. The technical processing staff has also appreciated and remarked the considerable potential role of the thesaurus in facilitating and improving the existing IR practices and facilities of the library in the near future.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1. Conclusions

This chapter gives some general conclusions and recommendations of the study based on the findings of the survey and in view of the actions that might be required in order to improve the current IR practices and facilities of the library.

The survey findings reveal that most of the existing IR practices and facilities of the IES library are neither efficient nor effective. The IR system of the library is operating with inadequate, inefficient or inappropriate conventional classification, cataloging and searching tools and facilities. These IR tools and facilities did not only lack proper design, consistent structure and coverage for the representation and retrieval of the library collections but also have never been revised and updated to meet the vastly growing library resources and rapidly increasing IR requirements of the users. Moreover, these existing limited IR tools and facilities of the library are not readily accessible and familiar to the majority of the users. Consequently, the technical processing, organization and retrieval of the documents in the IES library are very tiresome and time consuming. Particularly, the absence of subject access mechanisms or tools and cross references to related and relevant resources of the library are found to be one of the major constraints of the library IR services and facilities.

Generally, the results of this study show that there is a strong demand for updating the existing IR tools and facilities and for developing alternative and improved ones. These include revision and updating of the existing classification, cataloging and the transliteration guides or reference manuals and the devising of more appropriate subject

representation and retrieval tools like thesauri. The study results have also identified the need for designing and developing various other improved IR tools or facilities including SDI and CAS services. However, since simultaneous development and implementation of these IR tools or facilities are not feasible and manageable in an academic exercise of a period of short duration, the study is limited to proposing and demonstrating a prototype computer assisted thesaurus database. Accordingly, a preliminary attempt was made to demonstrate a prototype computer-assisted database on Ethiopian history. The opinion and informal feedback obtained about the potential role of this thesaurus database has been very encouraging. Both the library user and staff members have indicated the potential role of the thesaurus for enhancing the IR practices and services of the library will be very significant.

6.2. Recommendations

Based on the discussions and conclusions of the findings of this study, the following general recommendations are forwarded for further consideration and improvement of the library IR practices and services.

1. Currently, both the library users and staff members are facing lots of difficulties in identifying and locating required information sources in the library. The search efforts of users are usually not successful or frequently failed due to the inappropriateness, inadequacies and complexities of the existing IR tools and resources of the library. Thus, the library should offer regular orientations and formal reference services to the users.
2. The current classification cataloging and searching tools and facilities of the library are neither efficient nor effective for IR. The adopted classification and cataloging reference manuals, including the transliteration guide should be regularly and properly revised and updated to cope up with the increasing IR requirements of the

library users. Moreover, standardized and formal cataloging or indexing policies and guidelines should be developed and established in the library to facilitate the uniformity and standardization of indexing, cataloging or bibliographic compilation services.

3. Since its designing and development was not sufficiently based on appropriate standards and the IR requirements of the users, the in-house catalog database should be reinvestigated and reconsidered in view of current library users IR requirements and advancement of information technology applications in IR. Automation of the library services in general, and its IR in particular, is very important. Development of appropriate thesaurus and designing of user friendly interfaces should be considered as soon as possible in order to improve the IR efficiency and effectiveness of the library. The findings of related studies that are previously undertaken and results of this thesis may be reconsidered and contributed a lot regarding this.
4. Preparation and provisions of appropriate and actual subject (or documents content) representation and retrieval mechanisms with adequate cross-references are highly required in the library. However, as a prerequisite, this needs an appropriately designed, structured and a comprehensive subject heading or thesaurus to enable both the library staff and users to represent and retrieve relevant and related documents in the library. Thus, the library management should pay adequate attention for developing effective vocabulary control devices such as multilingual thesauri on Ethiopian Studies at least for the major disciplines and the major languages in which the library collections were published.
5. The prototype thesaurus database was not yet fully developed and formally tested. Thus, further collection, selection and incorporation of appropriate terms, and development as well as refinement of the thesaurus database should continue. This

may need to set up a committee (or project team) that may consist of subject specialists, information scientists or library staff members and representatives of the library user groups.

6. Although the coverage of the prototype thesaurus database is limited to certain English terms of Ethiopian history for a time being, similar techniques and procedures may be employed for terms in non-English language and the other major disciplines of Ethiopian Studies. Moreover, libraries with similar local collections and users, such as the Ethiopian collection section of the Kennedy library may also be benefited from the development and establishment of such thesaurus database.
7. Additional and adequate manpower and computing facilities should be allocated for the development and implementation of the thesaurus database as well as for the improvement of the library IR facilities and services of the library. The library should plan and launch some alternative and improved IR services including literature search, SDI and CAS to meet the current IR requirements of its users.
8. Generally, the development and incorporation of an online thesaurus in all IR services of the IES, including the manuscripts, archives and museum section services of the Institute is highly desirable. Thus, further investigations should be undertaken to develop and incorporate a comprehensive and an appropriate online thesaurus into the IR services rendered at the Institute.

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APPENDIX I

Questionnaire for the IES Library Users

Dear Sir/Madam:

I'm an MSc student of School of Information Studies for Africa (SISA), Addis Ababa University. Currently I am carrying out a thesis research entitled **An Assessment of the Existing Information Retrieval Practices and Facilities in the IES Library with a view to Developing Mechanisms and tools for Improvement.**

Its objective is to assess the performance of the existing information retrieval facilities at the Institute of Ethiopian Studies (IES) Library with a view to developing mechanisms and tools for improvements. The purpose of this questionnaire is to obtain facts and opinions related to the current information retrieval (IR) tools/facilities such as the library catalogs, indexes, user guides and reference manuals. You are therefore, kindly requested to assist through completing/filling this questionnaire by writing all the relevant information that you think may be helpful for the study.

All your responses and suggestions are treated confidentially and are highly valuable for the study. If you have any problem in completing the questionnaire please don't hesitate to contact the IES library staff members at the Circulation Desk, to whom you are also requested to return the questionnaire as soon as you have completed it. Otherwise, you may mail it through P.O. Box 150175, Addis Ababa.

Thank you for sparing your precious time and effort in completing the questionnaire.

Sincerely,

Kula Kekeba, MSc Student
School of Information Studies for Africa (SISA),
School of Graduate Studies (SGS), Addis Ababa University

Instruction: Please, mark 'X' against the boxes of your choice(s) and/or write your responses in the spaces provided. When the spaces provided are not enough to write your comments you may use the back of the paper or a separate sheet of paper.

1. Name of your Faculty/Department or Institution: _____

2. Your occupation: _____
 Academic qualification: _____

3. To which of the following library user groups do you belong?

- Undergraduate student Postgraduate Student
 A.A.U. Staff External user

Other, please specify _____

4. What is your purpose of using the library?

5. How often have you been visiting the IES library during the last six months on average?

- Daily 3-5 days a week
 1-2 days in a week Twice a month
 Monthly Rarely (less than once a month)

6. In relation to your visit to the library, would you indicate how often you use the following information retrieval facilities/tools at the library? (please mark 'X' along appropriate columns)

| No. | IR Tools/Facilities | Usage frequency | | | |
|-----|------------------------------------------------|-----------------|-----------|--------|-------|
| | | Always | Sometimes | Rarely | Never |
| 1 | Library Card Catalog | | | | |
| 2 | Printed Indexes and Abstracts | | | | |
| 3 | Document Citation/Reference Notes | | | | |
| 4 | Printed Bibliographies and Reference Manuals | | | | |
| 5 | Current Acquisition Lists in the IES Bulletins | | | | |
| 6 | Ethiopian Publications Register | | | | |
| 7 | Inquiring the Library Staff | | | | |
| 8 | Others, please specify: _____ _____ | | | | |

Please mention some of the reasons for the IR tools that you have rarely or never used.

7. How would you rate the accessibility of the following information retrieval facilities/tools of the library? (Please mark 'X' along appropriate columns)

| No. | IR Tools/Facilities | Degree of Accessibility | | | |
|-----|-----------------------------------------------|-------------------------|------------|-----------------|----------------|
| | | Readily Accessible | Accessible | Less Accessible | Not Accessible |
| 1 | Library Card Catalogs | | | | |
| 2 | Printed Indexes | | | | |
| 3 | Document Citation/Reference Notes | | | | |
| 4 | Printed Bibliographies and Reference manuals | | | | |
| 5 | Current Acquisition Lists in the IES Bulletin | | | | |
| 6 | Ethiopian Publications Register/Lists | | | | |
| 7 | Others, please specify: _____ | | | | |

8. How would you rate the effectiveness of the following retrieval tools/facilities you have used in the library for searching? (please mark 'X' along appropriate columns)

| No. | IR Tools/Facilities | Rate of effectiveness | | | |
|-----|-----------------------------------------------|-----------------------|-----------|----------------|---------------|
| | | Very effective | effective | Less effective | Not effective |
| 1 | Library Card Catalogs | | | | |
| 2 | Printed Indexes and Abstracts | | | | |
| 3 | Document Citation/Reference notes | | | | |
| 4 | Printed Bibliographies and Reference manuals | | | | |
| 5 | Current Acquisition Lists in the IES Bulletin | | | | |
| 6 | Ethiopian Publications Register/List | | | | |
| 7 | Inquiring the library staff | | | | |
| 8 | Others, please specify: _____ | | | | |

If there are some information retrieval tools that are less or not effective to you, please describe the reasons: _____

9. Please indicate your general judgments about the following features/facilities of the library catalog based on the given criteria and by marking 'X' against the columns.

| No. | Facilities/Features of the card catalogs | Degree of judgment | | | | |
|-----|---------------------------------------------------------------------------|--------------------|------|------|------|-----------|
| | | Very Good | Good | Fair | Poor | Very Poor |
| 1 | Appropriateness of the arrangements or filling of entries of the catalogs | | | | | |
| 2 | Adequacy of access points or entries | | | | | |
| 3 | Completeness of the bibliographic information provided | | | | | |
| 4 | Accuracy of the information provided | | | | | |
| 5 | Specificity of the document contents descriptor or indexing terms | | | | | |
| 6 | Adequacy of cross-references (links) provided to related topics or items | | | | | |
| 7 | Ease of use or convenience | | | | | |
| 8 | Compatibility of the access points with your preferred searching approach | | | | | |
| 9 | Adequacy of guides provided | | | | | |
| 10 | Relevance of information provided | | | | | |

10. How often can you independently identify and locate the documents you need using the existing retrieval facilities such as the library card catalog?

Always Sometimes Rarely Never

If your response is not 'always' please give the possible reasons for failure of you are search

What courses of actions would you take when your particular search is failed.

11. Rank the following library catalog access points in order of their priorities based on your previous experiences and their importance or usefulness for your information retrieval.

| Access points | Degree of usefulness | | | |
|-------------------------------------------------------|----------------------|-----------|----------------|---------------|
| | Very important | Important | Less important | Not important |
| Author entries/indexes | | | | |
| Title entries/indexes | | | | |
| Class marks/call numbers (classified subject catalog) | | | | |

Please indicate your reasons for less or not important access points? What additional access points would you recommend?

12. On average how long do you spend on searching (the library catalog) to identify a single relevant document you want?

- Less than 2 minutes
 10-15 minutes
 More than 15 minutes

- 2-5 minutes
 6-9 minutes

13. What is your opinion of the time you spend in identifying and locating the items you want?

- It is too much
 It's fair enough
 It's too little

Would you describe your feelings about the effort you make and spend in searching?

14. If you spend too much time and effort in searching, which of the following factors could be the reason?

- Absence of appropriate access points, such as alphabetical subject catalogs/indexes
 Absence of appropriate cross references for related topics
 Absence of appropriate guides and reference manuals
 Complexity of the card catalogs and reference manuals
 Misfilling and wrong arrangement of the catalogs/index entries
 Your lack of orientation on how to use the tools
 You do not have adequate search skill or experience
 You have brought wrong bibliographic information of the document want
 Others, please specify _____

15. How would you rate the timely accessibility of the current and new library collections based on your earlier experiences?

- Timely accessible
 Less timely accessible
 Not accessible

If your response to the above question is either less timely accessible or not timely accessible, please briefly describe the effects of this inaccessibility of current collections on your work

16. If you have experienced any problem in searching, which of the following ones have you frequently encountered?

- Lack of subject access points that indicates and represent the content of documents
 You are not aware of the existence of the IR tools/facilities
 Indirect subject access provision through the classification guide of the catalog not matching your search approach
 Transliteration inconsistency of local author's name and Ethiopian languages publications
 Language barrier or translation problems to identify relevant documents in the language you do not know
 Others, please specify _____

17. Based upon the existing IR facilities, how would you rate their ease of the following different types of library collections? (Please indicate your responses by marking 'X' along appropriate columns)

| Types of materials | Degree of ease for searching | | | | |
|-------------------------------|------------------------------|------|------|-----------|----------------|
| | Very easy | Easy | Fair | Difficult | Very difficult |
| Foreign language collection | | | | | |
| Ethiopian language collection | | | | | |
| Periodical collection | | | | | |

If your response to the above question is 'Difficult' or 'Very difficult', please mention some of the major reasons for the information retrieval difficulties.

18. To what extent are you satisfied with the existing information retrieval facilities?

- Very satisfied
- Satisfied
- Poorly satisfied
- Not satisfied

If your response to the above question is 'Poorly satisfied' or 'Not satisfied', please mention some of the major causes for your dissatisfaction/s

Please indicate briefly, the extent to which the existing information retrieval practices and facilities help or hamper your work and your suggestions for its improvement.

19. Suppose that, the existing information retrieval system is improved or automated, which of the following services would you like to be provided? (Please indicate your responses by marking 'X' along the services you want to be offered.)

- Selective dissemination of information (SDI)
- Current awareness services
- Abstracting and indexing services
- Alphabetical subject catalogs
- Literature search services
- Other, please specify: _____

20. Do you have any additional idea that you would like to recommend for the improvement of the existing library information retrieval services? Please write them here briefly: _____

Thank you very much.

Appendix II

Discussion Guide

Appendix II (a).Discussion Guide for the Head Librarian

1. What information retrieval (IR) tools and facilities are available to be used in the IES library?
2. Would you describe the major indexing/cataloging and searching policies, procedures and standards used in the library?
3. In your opinion, to what extent are the existing library facilities/tools efficient and effective for information storage and retrieval?
4. What do you see as the strengths and/or weaknesses of the current information retrieval practices and facilities?
5. What are the major information retrieval problems that are frequently encountered and complained about by both the library staff and users? What are the measures that have been taken to overcome the problems, if any?
6. In general, how do you see the achievements of the library objectives and the cost effectiveness of its information retrieval services?
7. What alternative mechanisms and tools would you like to propose/recommend to alleviate the problems and to improve the effectiveness of the existing information retrieval system?
8. Is there anything else that you think is important to be considered in this study that we haven't covered?

Appendix II (b), Discussion Guide for the IES Library Catalogers

1. Are there any cataloging/indexing policies, standards or tools that are followed or used in the IES library?
If there were, would you mention the major ones and describe to what extent they are helpful and appropriate for your work?
2. Would you describe the major activities and procedures that are involved in accomplishing your task?
How long does it will take you to complete the classification and cataloging of a newly received document?
3. What are your major outputs that are serving for information retrieval? How would rate the exhaustively and specificity of the classification notations and the cataloging description of the documents. Do you have a feedback from users about their effectiveness?
4. If you have experienced any problem(s) in processing, storage and retrieval of the library collections and their surrogates would you describe the major noes? What alternative mechanisms/tools would you recommend to overcome the problems?
5. I am aware that there is no alphabetical subject index or access point in the library catalog. Would you describe the reasons for its inexistence and the problems those results from its absence, if any?
6. Do you have any other suggestions that you wish to make for future improvement of the existing information retrieval system?

Appendix II (c). Discussion Guide for the IES Library Circulation Staff

1. What are the major information retrieval facilities and/or tools that are available and used in the library?
2. Would you describe to what extent these information retrieval facilities/tools are accessible, helpful and efficient for identifying and locating the library resources required by the users?
3. Would you describe the major activities and procedures that are involved in searching and finding a required document in the library?
4. What is/are the major and request approach(es) of users for information retrieval?
5. How would you rate the adequacy and the convenience of the current information retrieval tools and their access points to serve the users for identifying and locating relevant documents in the library?
6. What are the major problems that are frequently experienced by you and the users in using the library catalogs or indexes for information retrieval?
7. How often are the users successful in information retrieval without the assistance of the library staff? Would you describe the user group, which needs your assistance more frequently, and the reasons behind it?
8. What are the major reasons for the failures of users in identifying/finding required documents? What are the major limitations of the existing retrieval tools facilities to meet the user requirement?
9. What courses of action do you recommend to overcome the limitations and to improve the existing information retrieval services?
10. Do you have any further comments to make?

Appendix II (d), Discussion Guide for Staff Member Working on the IES Library Computer-based Catalog

1. Would you describe why and how the computer based catalog database was created?
To what extent do you think that the IR requirements of the library staff and users were considered in designing the database?
2. What are the major information storage and retrieval facilities that are provided by the computer-based catalog database? Would you mention the major services that are offered through the database?
3. To what extent does this computerized bibliographic database alleviate the limitations of the manual information retrieval system? What are the additional features and facilities that are provided for information retrieval?
4. What are the options provided for entering data, accepting or refining queries and retrieving information? How would you rate the user-friendliness of the database facilities?
5. Would you describe the major activities and procedures involved in searching the database?
6. Would you describe and demonstrate the retrieval performances such as search formulation browsing and displaying facilities of the database? How do you rate the retrieval efficiencies and effectiveness of the database?
7. Why are the end users not yet allowed to search and use the database? Do you have any intention to offer literature search services?
8. Do you think the catalog database is well utilized? If the answer is 'no', what do you think is the reason for less utilization?
9. Is there any problem that you are frequently experiencing in searching the database? If your response is positive, please mention the major problems together with their causes and possible solutions.
10. What additional information retrieval facilities/tools would you recommend to be incorporated into the database for its information retrieval (IR) improvement?
11. Do you think that the incorporation of certain information retrieval (IR) tools such as authority control and /or thesaurus into the bibliographic database could improve its retrieval performances?
12. Do you have any additional suggestions or recommendations for the improvement of the existing information retrieval system of the library?

APPENDIX III.

LIST OF INTERVIEWEES

1. Degifie G/Tsadik (Head Librarian)
2. Ebrahim Kassa (Head of Ethipian Languages Section)
3. Bahailu Jemaneh (Cataloger)
4. Bekele Gikamo (Catalogers)
5. Genet Tilahun (Cataloger)
6. Damtie Bizuneh (Circulation Staff)
7. Askale Haile (Circulation Staff)
8. Eyerusalem Asefa (Circulation Staff)
9. Fanuel Nibret (Circulation staffy)
10. Misrak Teferra (Circulation Staff)
11. Sahile-Mariam Kifle (Circulation Staff)
12. Solomon Desalegn (Circulation Staff)
13. Solomon Lemma (Circulation Staff)
14. Tabi Asfaw (Circulation Staff)
15. Tasfa Anberber (Circulation Staff)
16. Tamirat Abera (Circulation Staff)

Declaration

THIS THESIS IS MY ORIGINAL WORK AND HAS NOT BEEN SUBMITTED FOR A
DEGREE IN OTHER UNIVERSITY

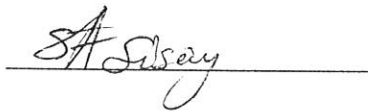
A handwritten signature in black ink, appearing to be 'Kula Kekeba', with the date '30/5/98' written below it.

Kula Kekeba

May 30, 1998

THIS THESIS HAS BEEN SUBMITTED FOR EXAMINATION WITH MY
APPROVAL AS UNIVERSITY ADVISOR

Ato Sisay Fissaha

A handwritten signature in black ink, appearing to be 'Ato Sisay Fissaha', written over a horizontal line.