ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATES STUDIES
SCHOOL OF INFORMATION STUDIES FOR AFRICA

DESIGN AND DEVELOPMENT OF AN IN-HOSE DATABASE SYSTEM FOR ARCHIVAL AND MANUSCRIPT RECORDS MANAGEMENT: THE CASE OF INSTITUTE OF ETHIOPIAN STUDIES

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN INFORMATION SCIENCE

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I also thank all the staff of Addis Ababa University Libraries who helped me to join the School of Information Studies for Africa and who assisted me in various ways during the course of writing my thesis. I would like to thank all SISA students who shared my problems and give me their fruitful ideas during my study period.

Finally, my hurtful thanks goes to my beloved mother Asnakech Mulatu who devoted the whole of her life to my success in life and academic carrier. I also express my sincere thanks to my beloved sister Selamawit Semeon who committed herself to help me in every thing I need during the two year study period and to all other brothers and sisters Tirufat Semeon, Tewodros Semeon, and Desalegn Semeon.

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ABSTRACT

Ethiopian Study is an area study. "Area study" is a field of study that falls within the scope of a group of studies which are multi-disciplinary in nature. The Manuscript and Documentation Center is one of the major units under the Library at the Institute of Ethiopian Studies that provide important historical information to researchers of area study, to students, staff, foreign scholars, etc. The materials reflect the cultural heritage of the Ethiopian people. The collection constitutes at the Center unpublished materials of various types, parchments, photographs, slides, postcards, microfilms/fiches etc.

The Center has information handling and provision problems due to mainly the unique type of collection and the existing manual system of preparing finding aids to this unique collection. It is believed that a computer based information system can help a lot in solving the problems of Manuscript and Documentation Center. In particular, by enhancing the accessibility of the manuscript and archival collection to users through providing indexes, query searching, selective searching by field or key word, and allowing multiple access.

To this end the existing system was analyzed based on extensive interviews conducted with the staff, document analysis and personal observation. User groups were identified and their requirements were surveyed using questionnaire. Based on the findings, a system was designed using an object oriented approach. Finally, a prototype was developed using dBASE for Windows in order to implement the proposed database solution, test it and draw a recommendations for improvement.

Among the problems identified in the existing system are the lack of properly organized finding aids, poor organization or arrangement of the collection, poor housing, no systematic recording of in-house collection management (i.e. accession, exhibition and restoration), lack of trained manpower and problem of security.

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CHAPTER ONE

INTRODUCTION

1.1. BACKGROUND

1.1.1. GENERAL

Research in the area of Ethiopian studies was started during the time when foreigners began to come to Ethiopia. But it received an impetus with the establishment of modern education in the country mainly at primary and secondary levels in the early 20th century. And it was strengthened by the foundations of post secondary institutions.

"Ethiopian Studies" is an area study. "Area study" is a field of study that falls within the scope of a group of studies known as entity studies which are trans or multi-disciplinary in scope. As such Ethiopian studies covers almost everything related to Ethiopia such as science and technology and natural resources, the useful arts and fine arts, language and literature, religion, philosophy, ethics and education and human resource development (Chomkwony et al. 1992, cited in Abebe. 1992). Currently, the major areas of research in Ethiopian studies include Ethiopian history, culture, ethnology and anthropology, sociology, languages, literature folklore, and related disciplines (Taddesse 1990).

Institute of Ethiopian Studies (IES) was established in 1963 with the general objectives of "conducting, promoting and co-ordinating research and publication on Ethiopia, with special emphasis on the humanities and cultural heritage of Ethiopia by collecting and displaying in

the Museum Ethiopian artifacts and items of historical value. (Tadess, 1990). The institute's tasks include hosting scholarly international conferences, symposia and exhibition, developing close ties with foreign institution and sponsoring research of foreign visiting scholars by giving scholarly advises and allowing them to use the library facilities. There are publications of IES which include Journal of Ethiopian Studies, Dictionary of Ethiopian Biography, Register of current Research on Ethiopia and the Horn of Africa.

IES has a museum and a library. Both of them were established in 1963 with the establishment of IES. The Museum consists ethnological objects, historical antiquities such as paintings and crosses. It has four sections. Namely, the Material Cultures section which is devoted to the material cultures of the people of Ethiopia; Religious and Medieval Art which consist old and beautiful objects; Ethno - Musicological section housing musical instruments and recording of traditional songs from may parts of the country; Coins and Philatelic section which contains Ethiopian postage stamps and collection of coins and bank notes. The museum has also its own publications including a complete catalogue of its holdings, a catalogue of poetry, a catalogue of processional crosses, the museum manual and a museum guide.

The IES Library with its very rich collection of books, pamphlets, periodicals, and growing archival collection on Ethiopia has also five departments. They are, the Manuscripts and Documentation Center, Ethiopian Language Department; Foreign Language Department, Periodicals Department and Technical Processing and Administration. Researchers both within and outside the University, instructors, graduate and under - graduate students are the major users of the library.

1.1.2. REVIEW OF RELATED STUDIES

Information system studies were conducted focusing on different aspects of IES by people from the information field (Abebe, 1993; Azene, 1996; and Woinshet, 1997). As emphasized by the studies conducted and as it stands now as well, among the reasons that call for such studies are the fact that the nature of information provision to researchers of area studies is challenging which requires developing tools like specialized indexes, see page studies, etc. reflecting interdisciplinary links between the research done in different fields. The other reason is due to the enormous collection of books, pamphlets periodicals and archival collection and museum objects of varying type, there is a need to develop databases of different types of records not only consisting of bibliographic records but also profiles of experts, of institutions, on going researches, artifacts and museum objects, if users are to be provided with efficient and efficient and effective services.

One of the studies which was conducted by Abebe Rrorisa was titled "An Ethiopian Studies Resource Centre: A Feasibility Study" for his masters thesis at SISA. The leading issue of this thesis was the "need to establish an Ethiopian Studies Resource Centre(ESRC) equipped with the necessary resources and information and capable of providing efficient services to the users of Ethiopian Studies:" in order to tackle the information provision problems being encountered at IES. Problems identified in this study include lack of satisfactory information services, absence of accession lists of currently added periodical publications, lack of catalogue for periodicals, limited access points of the traditional public catalogue, absence of retrospective database searching, absence of current awareness service, absence of selective dissemination of information service and lack of comprehensive database covering a wider

area. (Abebe, 1993). To this end an attempt was made to demonstrate the feasibility of database solution by developing prototype system consisting of (a) bibliographic materials, materials such as microfilms, motion pictures, audio records (b) profiles of institutions, expert/ research information systems, databases and research projects, (c) Serials. The prototype was designed using micro CDS/ISIS version 3.0 software.

Another study on IES was done by Azene Zenebe who graduated from SISA in 1996. He worked on the topic "A prototype Expert Advisory System for Ethiopian Studies". The study was based on the proposition that while the reference service makes up the primary function of IES library, problems were being experienced in the provision of efficient service. In particular, the following problems were identified. (Azene, 1996, p. 56)

- There is a shortage of experienced and skilled reference experts in the subject .
- Information to be provided to area study is spread over a wide variety of sources.
- Information needs evolve from a variety of fields or disciplines.
- Highly interdisciplinary nature of the subject requires various sources of information and which are special and scattered in different information centers.

In an attempt to solve the above stated problems the study aimed at designing and developing a prototype expert reference advisory system for Ethiopian Studies using expert system technology. The system developed was reported to be able to answer the basic reference enquries including directional enquiries.

A third major work is that of Woinishet Abdela, another graduate of SISA. The title of her study was "Incorporation of Multimedia Features In Conventional Cataloguing Database: A Case Study of The Institute of Ethiopian Studies Museum". This study focused on the museum of IES. The work mainly involved incorporation of multimedia features in the card catalogue of museum objects to enhance accessibility of the museum objects. She started by criticizing the work of Abebe Rorisa in its limited application to enhance information handling activity of museum objects by saying that the type of database proposed can not serve this purpose since the museum consists of non-book materials and objects of different type and process non-text information. In particular, museum objects for the most part consists of a mix of data types like text, still images, moving images, sound and video. Thus she proposed the incorporation of multimedia features in the previously proposed conventional catalogue database. To this end, a survey was conducted and based on the survey results, the study attempted to demonstrate the design of multimedia collection cataloguing and management system. Object orientation was employed in the course of the design work.

1.2. STATEMENT OF THE PROBLEM AND JUSTIFICATION

Without the past there is no present and without present there is no future. The past has its own value, be it good or bad. It is therefore out of necessity that we register and protect the past. One common way of registering the past is through the cultural heritage of a country. It is an accepted fact that this heritage is our collective identity as well as our image of yesterday. Without recording the cultural wealth, a modern urban society would have been created in a complete vacuum. (Girma, 1990)

Archives are the ones which protect and provide public access to important past human action or cultural heritage. [Wallace, 1996] Archives are valuable information sources constituting a major part of an information system and services within any national information system. "Archival materials or Archives are those records that are created by an individual or an organization in the course of discharging duties or functions" [Wanju, 1992]. Textual records, still photographs, motion pictures, films, video-tapes and related machine readable forms potentially are archives. They are non-current records which require acquisition, processing, storage and permanent preservation for their archival value. "Archives, then are those records of an organization, institution, or other entity that have been selected for preservation because they posses enduring value."[Wedgeworth,1993]. The comparable records of an individual or family are often called papers and manuscripts but there is no essential difference (from archives) in the nature of handling of these materials.

Today there is no doubt that Information Technologies (IT); i.e. computer and telecommunication technologies, have a major role in facilitating recording, processing, storing, retrieving, and disseminating all types of information including text, still image, animation, sound, and video (Woinshet, 1996). Archival institutions are benefiting from technology. There are different attempts to device mechanisms to deliver both the products and holdings of archives in computerized ways. In this sector, computerization may cover the automation of traditional finding-aids which are archival descriptive documents including catalogue, guide, inventory, calendar, list, index, or similar document used for making archival collections accessible for use. Automation of these finding aids has improved the efficiency of information retrieval on archives. In addition to automating finding aids,

"Computers are being used in many archives to generate or hold transfer lists, accession registers, location lists, retention and disposal and their tracking records for conservation, reprographies and other aspects of in-house management." [Kitching, 1991].

Electronic document management technology is another technology which is being highly utilized for archival storage and retrieval of document material. Here, paper documents are scanned and the documents will be digitized and then stored on optical disks. Then, A database of indexes will be developed so that the user can retrieve document images.

In order to meet the cultural heritage responsibility, archivists are also devising mechanisms to deliver archival information over distributed computerized networks. Internet is also being used to publish archival information and make it available world wide.

In the case of IES, archival materials are handled by the Manuscript and Documentation Centre with in the library. In addition to this there is also another repository which is known by the name "Wolde Mesquel" Memorial Research Centre which holds important documents of different ministries and/or department and of different governmental and non-governmental organizations. This research Center is located near the grand palace at 'Arat Kilo'. At IES, generally, there are four types of collection holdings. Namely, a) Manuscripts b) Archival materials both in hard copy and microfilm. c) Photographic collection, slides and post-cards and d) Clandestine Literature on Ethiopia. The holdings of Manuscript and Documentation Center at IES include manuscripts, the earliest of which date from the 14th century and they consist of, chronographs, biblical works, apocryphal and pseudo-epigraphic literature, service books, prayers and hymns, theology, lives of saints, homilies,

This may be due to, as Kitching (1991) said , "...lack of understanding of archival concepts by outside developers". In addition to this there is no standard for archival records description. As Durr (1988) explained the problem, "...what one archives calls as record group, another calls a series; while one describes records only to the collection level, another describes them down to the folder, and so on. This means that each modern archivist wants his or her own custom-designed database management system." Even if there are softwares the option is limited as compared to that of library automation packages. "As a specialized market for computer applications, archives has been too small to attract real interest from most software manufacturers." [Kitching, 1991] In addition to this, the peculiar nature of the collection and information handling practice existing in the case of IES, including the language here calls for developing an in-house databases.

The above stated problems and the following major problems found during a preliminary investigation made necessitated the current work.

- The card catalogue does not represent the whole collection, they are hand-written and do not follow a certain standard.

- There is a ledger system used for registering items when they are acquired and the same ledger is used for accessing the collection. The list is neither ordered by any key nor classified by collection type.

- When it comes to accessing the archival and manuscript collection, it is difficult to locate a particular material due to the incomplete catalogue and the unordered list in the ledger. Both the catalogue and the ledger do not allow multiple access.

- Among the materials most of the photographs have not yet been sorted-out and given a number or description.

- At the time of acquisition, it is often difficult to know whether the material is available in the collection or not.

- There is also inventory control problem as the size and diversity of the collection is increasing.

- There is shortage of trained manpower.

Thus, the purpose in this study was to further investigate the current problems and propose a database solution that may solve some or all of the problems.

1.3. OBJECTIVES

1.3.1. General Objective

The general objective of the study is to analyze the existing information handling system with the aim of proposing a database solution which may enhance the accessibility of the archival and manuscript collection at IES.

1.3..2. Specific Objectives

1) To identify different user groups of IES manuscript and archival material and study their information requirements.

2) To investigate specific features of archival and manuscript material and document the existing information handling practice at IES.

3) Identify the problems being experienced in information provision or use at IES.

4) To explore the possibility of applying such current technologies as object-orientation in addressing the problems being experienced at IES in general and Archives and Manuscript Department in particular.

5) To develop and test prototype database system on the basis of the user's requirement identified.

6) To draw recommendation on the basis of the test results.

1.4. METHODOLOGY

1.4.1. Data Sources and Materials

The following sources and materials have been used in the study.

- Records from IES Manuscript and Documentation Center.
- Users of the department (researchers, academicians, students etc.)
- Literature for acquiring knowledge about practices in computer applications for archives and manuscript collection.
- Personal observation.

1.4.2. Data Collection Techniques

In order to identify user's requirements the following techniques have been employed.

- Questionnaires were designed and distributed to users.
- Interview guide was prepared and interviews were conducted with the staff of the Center.
- Observation was also used to asses the current practice of information handling and retrieval methods in use at the Center.

1.4.3. Data Analysis And System Development Metrology

An Object-oriented approach was followed in designing the database system since it provides the mechanism for sharing attributes and behaviors amongst layers of class hierarchies. Using the technique available in such approach, concept could be mapped to the different levels of archival description (fond/group level, sub-group level, series level, file unit level and finally document level). In addition to this Object-oriented systems development technique provide benefits such as more realistic modeling; faster design; modularity; reusability; stability; easier maintenance; reliability; higher user communication. [Hervey and Press, 1996]. dBase for windows was used to develop the prototype. The prototype was demonstrated to users and tested. On the basis of the test results recommendations were made.

1.5. ORGANIZATION OF THE THESIS

This report consists six chapters. Chapter two deals with archival and manuscript records management. It provides description on what archives are, types of archives, major functions and services, automation of archives both conventional approaches and current trends and the situation of Archival records management in Africa. The third chapter deals with the analysis of the existing system based on the survey results, indicating problems of the existing system and solutions to solve the problems. The fourth chapter focuses on the proposed database solution and describes the objectives, the components and the detailed specifications of the newly proposed system. The fifth chapter deals with prototype development, testing and presents discussion of the test results. The sixth chapter concludes the whole work by presenting discussion of the findings, and recommendations related to furthering the work.

CHAPTER TWO

ARCHIVAL AND MANUSCRIPT RECORDS MANAGEMENT

2.1. SYSTEM OVERVIEW

2.1.1. WHAT IS ARCHIVES

According to published literature, Archives may be used to refer to any one of the following.

a. Non-current records of an individual or organization which are selected for permanent preservation for their archival value.

b. The agency responsible for selection, acquisition, preservation and communication of archives.

c. The building or repository where archival materials are preserved and made available for consultation. [Wanjau, 1992]

Archives as used here refer to information systems consisting mainly three major categories of archival materials: official files of institutions and organizations, publications issued by such bodies, and personal papers of individuals. While describing archives as an information system, Brichford and Maher (1995) summarized the following seven major areas of professional responsibilities.

- Archives are established, administered, and evaluated by institutions,

organizations, and individuals to ensure the retention, preservation, and utilization of archival holdings.

- They are authenticated by analysing their content and obtaining evidence of their source during the process of their accession.
- They are appraised or evaluated on the basis of their anticipated use in relation to the costs of description and long term retention.
- They are arranged according to source in the original order or structure in which they were kept while in active use.
- They are described in finding aids like inventories, catalogues, guides, lists, etc. to facilitate long term access to their information content.
- They are preserved to ensure their future availability in a safe environment and on media that will remain accessible or renewable for the period of anticipated use.
- They are used to explain the past, provide guidance in the present, and accountability to the future.

Archives consist records in vast languages representing all types of persons and organizations and exist in different formats. The fundamental purpose of archives is to preserve and make available for research, information of enduring value. These archival value of records include, administrative, legal, evidential or informational value which justify the indefinite or permanent retention of records as archives.

2.1.2. TYPES OF ARCHIVES

According to Penn, Pennix and Coulson (1992), there are three types of archives which house historical information: **public archives, historical manuscript repositories, and business archives.**

Public archives are the repositories of those records whose enduring value may be primarily legal, but which may become historical over time. They are official records created by federal state, central or local governments which take two forms:-

i. Records filed with or by a government agency as a proof of private ownership of a commodity or privilege, or which establish citizenship or other rights (deeds, wills, license, birth records, naturalization papers, etc.).

ii. Records of the administration of governmental functions (policies, methods, results, etc., affecting society).

Under **historical Manuscript Repositories** some organizations, particularly universities, maintain archives comprising records other than theirs and not necessarily related to their own functions and activities. Collections in manuscript repositories are usually acquired by gift or purchase under a written collection policy.

Under **business archives** there are non-governmental records used to preserve the history of corporations, companies, and similar enterprises, bodies which create and own their records.

2.1.3. MAJOR ARCHIVAL FUNCTIONS

The following few paragraphs discuss about some of the major archival functions.

i) Acquisition

Acquisition is the basic duty of the archives which starts with the management of current and semi-current records which enable to make decisions on how the records will be organized, what will be destroyed, at what point to be destroyed, and what will be transferred to the archival institution for preservation.

ii) Accessioning

Accessioning is the process of receiving archives and bringing them in to the repository. Through accessioning, the archives become the physical and legal owner of the records. During this process a record will be maintained using an accession register or by some other means, the details of which include: date of transfer, transferring organization, series and pieces references, description of series, a quantification of the volume, an indication of the period covered, agreed arrangements, location of the records in the archives repository and details of the storage location. Where the archives are not immediately processed there may be an indication of the processing priority. Other supplementary information may be kept, such as an alphabetical list of groups and numerical list of series within groups, showing the number of pieces within each series and the repository location. Accessioning is important in

that if access to the archives should be required in this interim period then at least the whereabouts of the archives are known and they can be retrieved and made available. [Mazikana, 1990; Penn, Pennix and Coulson, 1992].

iii) Arrangement and Description

Arrangement in the context of archives, is defined as "the process of putting archives and records into order in accordance with accepted archival principles, particularly those of provenance and original order. If there is no original order, the archivist may impose an order which presents the records objectivity and facilitates their use." [Gracey, David B. in Katharine, 1990] A further expansion of this definition states that arrangement is the process and results of organizing archives, records, and manuscripts in accordance with the accepted archival principles, particularly provenance. In the principle of provenance, the records are maintained in the order in which they were transferred to the archives which is not necessarily the order in which they were created. Provenance maintains archives of a given organization to constitute an organic whole, not to be intermingled with records of other organizations. With the principle of the original order records are maintained in the order in which they were kept when in current use. The principle of original order maintains the close relationship between the individual component units.

When we follow particularly the provenance, the records and archives should be organized as necessary in of the following levels:

Record group: arrangement at the group level consists of allocating new accessions of records on the basis of provenance to existing record group or, if necessary, to newly established record groups. This means that all the records of an organization, and the archives subsequently selected from them will be allocated new accessions together. Under the record group concept, any particular body of records can belong to only one record group and they are kept together.

Sub-group: Arrangement at a sub-group level consists records of primary subordinate offices or other administrative units that together constitute the record group.

Repository: This arrangement level is accomplished after identifying the group. It relates to the placement of the identified group to an appropriate custodial unit in the stack of the repository. This is made initially on the basis of a distinction between public records and non public manuscripts (including personal papers); then, in broad functional or hierarchical division; and finally, between "open" and "closed" record groups. The closed record groups consisting of the records of discontinued agency to which no further accessions are expected.

Series: Arrangement at the series level consists of a body of file unit having documents that are interdependently linked together. This arrangement helps to facilitate the use of archives and at the same time preserving their integrity in the organizational and functional content from which they emerge.

File Unit: It is a folder, the dossier or case file which themselves are grouped in series. They should hold a correct placement in the series.

Document:- This is the final level of arrangement which represents a primary physical unit in the record group and its sub-groups. It is a single item on which information is recorded that may take varied forms like, letter or memorandum, a report, the minutes of a meeting, a map or a chart, a photograph, a sound recording, a real of microfilm or magnetic tape.

As shown, the above mentioned two principles have implications on archival arrangement on the one hand, and on archival description (preparation of finding aids) on the other. The description is a means which mainly serves users in identifying the archives held and they need to reflect as accurately as possible the contents of the piece without being too long.

Description involves the preparation of proper finding aids. "Finding aid is a term used generically to cover all types of archive description documents. This may be comprehensive or limited in its coverage, general or detailed in its descriptive data, and may pertain to holdings of any size. A finding aid may be a catalog, guide, inventory, calendar, list, index, or similar document; it may be in paper, micro, or magnetic form." [Penn, Penix and Coulson, 1992]. Finding aids are keys to making the holdings in an archival collection accessible to users. They may provide a group level description to give information on all records in a repository; a series level description to provide special information that may be needed about the records; and document level description when there is a need to provide specific

information about particular records. Since recent years, however, there has been a trend towards the use of three basic types of published finding aids: inventories, guides and detailed lists.

Inventories: An inventory is prepared for each record group or major subgroup, in which the unit of entry is the series. The body of the inventory or register consists individual series entries organized in the framework of the sub-groups in the record group. The archivist need to device series titles that are unique and that convey the maximum information to the user. This information includes the type of records that constitute the series, the functions and activities they reflect or to which they relate, the inclusive dates within which the series was created, and its quantity. For example, a series title for personal papers may include "correspondence" which may be sub-divided into "family", "business", "professional"; "diaries"; "lecture notes"; "speeches and writings".

Manuscript registers also include a descriptive level below the series, where box lists, consisting of the titles of all the folders in each box of the collection, are provided.

Guides: Here the basic unit of entry is the record group or manuscript collection. The guide summarizes the administrative history, structure, and functions of the particular agency that corresponds to each record group or biographical information about the person represented in personal papers collections, and collectively characterizes the records that constitute the record group in terms of physical type and forms, inclusive dates, quantity and general subject content. It should also include any restrictions on

access or use of the records, as well as bibliographical data on published finding aids and relevant documentary or other publications.

Detailed Lists: Detailed lists usually consist catalogues, calendars and indexes. They may describe individual file units or document from more than one record group, subgroup, or series that relate to particular subjects, but they are usually confined to the contents of single series or sub-series. Such detailed lists are of particular value in assisting users of a series whose original arrangement is unknown or that lacks any original arrangement.

iv. Repair/Restoration

In repair or restoration function, those records arriving with damages are passed on to a place where they will get appropriate diagnosis and repair.

v. Organizing training courses, workshops, and seminars

This is prepared for both in-house staff and also personnel dealing with records creation and maintenance. These are done jointly by the various units and also with cooperation of various departments, ministries, parastatals, and the courts.

2.1.4. SERVICES TO USERS OF ARCHIVES

i. Reference Service:-

This is a type of service which aims at furnishing records for use in search rooms. Search rooms are analogues to library reading rooms. Repository staff members attend to user inquirers when they search for examine records and advise them about records that seem pertinent to their research and explain to them how the records are arranged and what guides, inventories, lists, or other finding aids are available.

ii. Information Services

On a limited basis, archivists provide information from the records in response to written and oral inquiries. They often furnish specific facts, such as the date or place of an event and the names of principal participants. They may furnish more extensive information for administrative and legal purposes to the agencies that created the records and as a curtsey to high ranking public officials. When this is done, usually, they try to keep written replies reasonably concise and responsive to the inquiries and may use form letters, or standard wording to reply to recurrent type inquires.

Information about records may also be provided orally or in writing, and inquirers are encouraged to seek such information before visiting archival search rooms. If their requests involve consulting large bodies of records, they are informed of the titles of the pertinent

record groups or other subdivisions of the records and of the inclusive dates and quantities thereof.

iii. Copying

The copying service generally provides electrostatic, photo-static or microphotographic copies of records at nominal cost and make them available for research and other uses.

iv. Lending

This service is provided under special circumstances. Normally it occurs when organizations that created the records or their successors, need them for administrative or legal purposes or exceptionally when such organizations give related organizations official permission to use them. Most of the time loans are not made to individuals outside of repositories.

v. Exhibits

This service is used to publicize the holdings of the archives and develop popular appreciation of historical records as cultural resources.

vi. Document Publication

This is part of a reference service because it disseminates in published form a part of the holdings of archival institutions. Accession lists are one of the published materials used for this purpose.

2.1.5. THE EVOLUTION OF ARCHIVAL RECORDS MANAGEMENT

Most of the innovative records management systems have been introduced in the last half of the 20th century. But when we look at the earliest development the first national archives was established in 1790 by France, whose revolutionary government proclaimed the right of access to public records. About 50 years later, in 1838, a central archival institution was established in England. [Wallace, Lee and Schubert, 1992].

Historically, the following creative methods were implemented to satisfy the need to control records [Wallace, Lee and Schubert, 1992].

- The first method was using spindle file, in which the papers are pierced on a long spike. This was used by merchants during the middle ages in order to handle paid and unpaid bills separately.

- In 1960's typewriter were invented which resulted in a dramatic increase in paper work. Due to this, flat files and drawer files were used where papers are laid flat and each drawer was assigned a letter.

- Later a Shannon file, similar to clipboard was used to overcome the inconveniences of the flat file where papers are loose in the drawer. A Shannon file held papers securely and provided business people with a sense of security.

- Vertical file came in 1892. This was discovered by Dr. Nathaniel S. Rosenau's, a secretary of a charity organization in Buffalo, New York. He reasoned that papers could be filed in the same manner as cards; that is standing on end.

- In 1930's the first commercial use of micrographics, producing microimages on film occurred. This was first invented by McCarthy, a bank clerk in New York and later improved by Eastman Kodak.

- The use of digital computers in 1950's in storing large amounts of data has led to the implementation of more sophisticated computerized methods of records control and micrographic usage for inactive record storage during 1960's. During 1970's greater use of micrographics appeared in both large and small offices.

- In the 1970s, micrographics and computer systems were combined to produce computer output and computer input micrographic systems. Micrographics reduced hard copy to a fraction of its originals, and the computer enabled data to be retrieved in a fraction of the time needed for retrieval of hard copy.

- In the 1980s microcomputers were widely used to store records in electronic or magnetic form (floppy disk).

- In 1990s image systems that utilize optical disk technology to store documents became popular. This optical disk storage has offered high volume data backup for archival records. These technologies of image management systems for long-term

storage of data and more rapid access to records than the micrographics are the current trends.

2.2. APPROACHES TO AUTOMATION

2.2.1. CONVENTIONAL APPROACH

The electronic revolution has affected archives in two ways. First, since they are an information system they have applied the technology to increase the efficiency of retrieval by automating the finding aids (catalogues, indexes, guides, etc.) of the archival and manuscript materials. Secondly, this days' office automation has made most of the records to be kept on magnetic media and archives have to preserve the valuable part of such records.

At early dates, high cost of computers and lack of training were the main problems for archivists not to respond to electronic revolution. But the advent of affordable word processing during 1980's was the first indicator of how it can be used to transform the traditional finding aids in to electronic form. It was used for its ease of editing and updating and to produce registers, inventories, folder and box lists, catalog cards and other sorts of finding aids. [Gilliland, 1988; Kitching, 1991].

The other step towards the application of computers is the setting-up of databases to control information about archives. "A database is a means of storing and manipulating by computer such information that can be presented in a structured form" [Kitching, 1991]. Many of the elements of traditional archival finding aids are structured consisting of such elements as call

number, date, descriptions, originating entity, series title, quantity, etc. All of them fulfill the requirements and can easily be made the subject of databases. The pre-existing created information using word-processing can also be encoded by such means as optical character recognition for incorporating into databases. The database development for archival record and manuscript collection has brought a tremendous improvement over the traditional finding aids. Indexing, query searching, selective searching by field or key word, outputting the entire content of the database in printed form or microfiche, presenting the information in different ways like chronologically, alphabetically or by subject matter, are all the improvements that have been made by database development. "Databases can be seen as a single, integrated finding aid in its own right or as the potential source of a number of different kinds of finding aid (which need only be print out, in whole or in part, if there is a demand), all stemming from the same input information"[Kitching, 1991]. In addition to this the use of computers has enhanced control over a growing mountain of information, and has saved wear and tears in originals.

The content of the database varies from archives to archives. In some archives databases are developed to supply information about the originators of the archives whether institutions or individuals. For instance, in Brazil the Records and Archives Management Program (RAMP) database contains for each agency of government, its name, functions, details of predecessor or successor bodies with the same functions and information about relevant legislation affecting its operation. In the case of Australia, ANGAM II (the second part of the Australian National Guide to Archival Materials) is a database consisting of number, title, date-rang and location for each series of records over 30 years old, together with a note of their availability

in accordance with the Archives Act. Title of the creating agency is used as access point through the ANGAM indexes.

In relation to the experience in computerization of papers of private individuals, families and institutions, National Register of Archives in UK has a database which includes details of the collection or series title, its location, and indexes of persons, companies, and other record creating entities including churches, hospitals, schools trade unions and families.[Kitching, 1991].

In relation to software used to develop a database UNESCO's CDS/ISIS and its derivatives have been found very suitable for archival application, although they were originally designed for libraries. Countries which have used this package include Hungary, Zimbabwe, Canada, Chaina, Soviet Union and Portugal. In addition to using standard packages there are also countries which have developed in-house software in order to meet their specific need, either by their own in-house specialists or in collaboration with, for example, regional or local archives. Such countries include, for instance, Belgium and Sweden, the former applied it to the university computing center and the latter to regional archives.

By the time a database is created using a standard or in-house developed package, data capture is made through various ways, the most common methods being either re-keying the information from the original means of reference or scanning it digitally using a technology like Optical Character Recognition(OCR) techniques. The data captured using either ways will be accessed through access points like topic, personal or place name, medium or format of records, provenance and call number.

While designing a computerized finding aid there is a need to consider different kinds of users (i.e. archivists, record originators, the public/users) and there is also a need to serve their requirement with different approaches based on the nature of their demand. For example, while designing for the archivists the principle of provenance may be respected, while for the users there may be a need to provide detailed guidance to get the best out of the system. The users may need separate screen-prompts and menus from those designed for the archivist.

2.2.2. CURRENT TRENDS

There are recent developments in computer technology which have an impact on the storage and retrieval of archival information. Some of the technologies will be reviewed here to give an insight.

2.2.2.1. ELECTRONIC DOCUMENT PROCESSING SYSTEM

This is a technology that integrates and uses several technologies to capture and retrieve documents. Image-processing system utilizes Optical and Video disk technology to store images of original paper documents and sound recordings respectively. It also utilizes computers for communication and display, and database software for record organization and retrieval. This technology is used to overcome the weaknesses of data processing systems which deal with one dimensional storage of data. [Wallace, 1992]

There are two ways of creating an electronic document image. The first one is through digital bit-mapped image. The bit-mapped image produces a sub-sampled version of original document material. It will capture all information contained on the original document page. It captures typeset, signature handwritten information, endorsements, annotations between lines or in margins bar-codes, line drawings, lines separating sections of forms or printed materials, etc. Digital image scanners are used to convert document material in to bitmapped imagery. The scan resolution needs to be higher for better representation of the original document. A bit-mapped image represents every point within the image as either black or white. Thus, the bit-mapped binary image format is well suited to representation of document material containing textual material (printed, handwritten or both). It is used where it is important to retain complete image of the original document material and it is analogues to film-based micrographics system. But the problem with bit-mapped binary image format is that it requires relatively large amounts of computer storage. [Green, 1993]

The second way of creating an electronic document image is alphanumeric representation of the document. In this case OCR technology is used which extracts the printed material from the page. It incorporates the pattern recognition technology that isolates each individual printed character of text and produces a series of alphanumeric characters in ASCII character representation that represent the printed material on original page. This type of representation requires minimal amount of computer storage. The problem with alphanumeric representation is that it is unable to capture non-textual information document. It has limited use in cases where the documents are not clean, when the characters and images are not distinct and when the page is with wrinkles and tears. In addition to this, OCR unit must be compatible with typestyles or fonts of the word processing equipment. [Green, 1993; Wallace, 1992]

From the two options stated above the one which may be more appropriate for archival records is the digital bit-mapped image. This is because it provides full image representation of scanned document material and the preservation of the exact shape and location of the information content of the original source document. OCR can also be coupled with full page binary image scanner to scan and interpret a unique sequence or identification number, which is later used as an identifier to index, store, and retrieve the image of the full page in bit-mapped format.

For the stored electronic images there will be a database of indexes. Here indexing and retrieval software is used to accept the specific field and record structures established for the files. To retrieve the document images, the user enters indexed information into the retrieval workstation where image/images are viewed on the monitor and if a hard copy is required reproduced on a laser printer.

Digital storage technology (eg.WORM), electronic scanning technologies, high communication technology in the networked environment, image display technology are some of the technologies involved in the electronic document processing system.

Other advantages of electronic document processing system include storage, document security, multiple access, and faster query and retrieval. Such system also maintains the image of the document as good as on the day the image is created for a long time.

One implementation example of image processing system is that of National Archives and Records Administration- Optical Digital Image Storage System (NARA ODISS). The pilot project was started in 1986 and ended in 1989. The samples considered in the implementation included materials with varying age, having varying paper size and weight, written with different writing instruments (stained, discolored, folded, or damaged). These sampling sets were good to evaluate modern electronic scanning and image processing technology. Microfilmed materials were also included to see the efficiency of document preparation required for film. The results from the digital scanning process indicated that 53, 783 individual files were contained in the Tenessee Compiled Military Service Records (CMSR's) of the U.S. and 220, 713 images were produced from this material. Five 12 inches optical disks were required to store the material; the paper document material occupied 80 cubic feet in the NARA archives. One of the major objectives of the ODISS pilot system was evaluation of the ability of commercially available scanning equipment to handle fragile documents, documents of different size and paper weight, and documents with varying image quality. [Green, 1993]

It is stated that ODISS project demonstrated a three-fold reduction in the amount of staff time required to search and retrieve name index files of the Tennessee Confederate CMSR. The search and retrieval system provides also greatly enhanced access capability to the materials. Other advantages of the project include, improved image legibility, improved timeliness and accuracy of access, an enhanced retrieval capability, reduction of storage space requirements, and reduced or eliminated handling of original documents.

2.2.2.2. COMPACT DISK READ-ONLY MEMORY (CD-ROM)

This has a tremendous storage capability and is nowadays commonly used to store general-purpose digital data in personal computers. For archival purpose it can be used as an alternative to hard copy publications of texts and finding aids including databases and also as an alternative to networking. [Kitching, 1992]

The American Memory Project is an example of how the technology of today is used to make collections more accessible to the general public. Library of congress archivists organized a collection of historical materials on a CD-ROM in Macintosh format. This multi-media, automated archival project contained such items as political cartoons (1770-1981), early sound-bytes from American leaders (1918-1920), early motion pictures from New York City (1898-1906), and many other collections. The system offers Boolean Keyword searching and user friendly access to MARC records. [Weiner, 1995]

2.2.2.3. COMPUTER ASSISTED RETRIEVAL (CAR) SYSTEM

CAR systems are recent technologies which are of age since 1985. They involve two technologies: Micrographics and Computer. The micrographics supplies sophisticated cameras and retrieval devices as well as an inherent ability to store vast amounts of information inexpensively. The computer brings its speed and data manipulation capabilities to handle indexes and associated information.

Records are microfilmed by intelligent micro image cameras and the images are then processed. The information identifying the records is captured and used to create computer indexes and databases. When the database is searched, individual records can be located by using their computer generated names.

In a microfilm CAR system, the basic unit of data being managed is an index, which is the location of records stored on microfilm. The index can contain a description of the document or record , as well as the actual microfilm frame and roll numbers.

There can be two types of CAR systems for handling indexes and retrieving microfilm: on-line(direct access) or off-line(indirect access). Off-line CAR has indexes that are maintained by the computer, but retrieval is maintained manually. In this type of information the operator inputs information in to the computer, to search for a specific record. The computer displays the location of the record for the operator. Next, the operator manually loads the microfilm into a retrieval device to find the correct image.

On-line CAR (direct access) offers automated indexing and retrieval of specific images. Here again the computer maintains an on-line index. In addition, a microfilm retrieval device is attached electronically to the computer terminal. This interface or attachment between devices allows the computer to direct the reader to find the correct image for the operator.

2.2.2.4. MULTI-MEDIA SYSTEM

Multimedia refers to the extension of a graphical user interface to enable the integration of digital sound, still images and real-time video. In the area of archives, multi-media technology is seen to have a potential contribution. It can be used to capture and present information on archives. Art history archives and catalogues are obvious potential beneficiaries of the multimedia approach. Art Gallery developed by National Gallery in association with Microsoft is one of an interesting multimedia application. Art Gallery is a computerized information system which contains background information on every painting in the National Gallery, and allows freely to explore his or her particular area of interest whether painting artist, period, subject or general. At the heart of the system is a complete illustrated catalogue of the Gallery's holdings. [Hervey and Press, 1996]

Another example is the work recently undertaken by the Royal Commission on the Historical Monuments of England (RCHME) on the feasibility of establishing a multimedia database combining computerized data and images which might be integrated independently of its physical location. Textual and visual archives were selected from the National Buildings Record, the National Archeological Record, and the List of Historic Buildings, then held by the Department of the Environment. It is anticipated that the application of imaging technologies will reduce the cost of providing public access to RCHME data; eliminate the need to print in excess of 25, 000 new photographs annually; reduce wear and tear (and hence conservation costs) on documents; and create revenue by producing CD-ROM-based products for picture agencies, libraries, tourist boards and the educational market. Such projects often

make use of hypertext-type techniques to enable users to navigate the data in non-linear ways.[Hervey and Press, 1996]

In this line Library of Congress has also taken the first step in a multi-media presentation and linking its holdings of manuscripts, sound recordings, books, motion pictures and graphic and photographic materials thematically in series. [Kitching, 1992]

2.2.2.7. INTERNET

Archivists are beginning to see the value of the Internet in their organizational efforts, and there are also archival use of the Internet. A study was made to know which archival institutions were attempting to publish information on their archival holdings on the Internet by Wallance D. A. (1996). He reviewed 15 sample WWW archives sites out of a total of 55 residing in two archives multi site guides. According to his observation the type of holdings published on the Internet include text format, still image, moving image, sound etc. Still image is the most prevalent in most of the sites surveyed. Some sites provide a hyper text link within fond level finding aids. Most of the sites provide a handful of representative digitized images. E-mail address is provided to users by most of the sites in order to give a reference service.

2.3. ARCHIVES AND RECORDS MANAGEMENT IN AFRICA

The situation of archives and records management in Africa is that although many African countries established their own archival institutions after independence, little attention was paid to them and they are more involved in preserving historical records and not involved with day to day records management activities. The existing situation is does seem to be good for archives and records management in Africa. As Mnjam (1993) indicated "although a breakthrough is beginning to be seen in some African countries like Kenya and Zimbabwe the state of archives and records management in Africa is, on the whole, rather disappointing".

Lack of adequate funds and trained personnel are often cited as the main causes of the many problems of African archival institutions. In most of the cases, wrong kinds of staff who have no adequate and appropriate training are assigned and this is seriously affecting the archival services. Lack of adequate resource is thus the challenge facing many archival institutions in Africa and became the main cause of archival under development. [Mnjama, 1993] Lack in Africa storage facilitates has also been considered to be a cause of poor archival services. It is indicated that better management of available storage space and other resources can greatly improve the archives situation in Africa.

There is also lack of policies, standards, and procedures which causes inefficiencies in archival functions since they lack guidelines as to how the records are retained and disposed; they lack uniform file classification schemes, manuals and operating instructions to sustain the systems. This lack of uniform classification schemes has made unrelated materials to be

filed together and due to this a wider search is required in order to identify relevant information from the file. In addition to this, disposal of records becomes more complicated as every piece of material must be examined individually.

It is reported that, records rooms themselves are poorly maintained. Dust accumulation is excessive. Most of these stores house records in a haphazard manner. No lists are retained of files held in the storage area. In several countries there does not seem to be for mechanism for controlling the flow of records. Once records leave the registry, it is common place for the registry clerks to rely on their memory to retrieve such words.

The solutions suggested by Mnjame (1993) in this regard are summarized as follows.

- Attention should be paid by African government for archives and records management. Senior administrators and others involved in decision making processes should begin to see records as a corporate resource comparable to other resources within their governments. Records must be seen as an indispensable resource providing information for effective decision making and planning. Attention should be paid for better storage, better training opportunities, better schemes of services and effective legislation.

- There is a need to market records management programs to senior administrators and other decision makers.

- Proper selection of archivists and records managers is another important area. They should get proper training which can solve the existing problems of archives.

- New tools and techniques should be developed that can help proper storage of records and efficient retrieval.

- Another area which needs immediate attention is the introduction of revision of archival legislation. Such legislation must be in line with modern records management concept, which view records as a corporate resource and which also involve the entire records management cycle.

CHAPTER THREE

ANALYSIS OF THE EXISTING SYSTEM AT IES

This chapter attempts to deal with two major issues. The first one consists analyses of the existing system of information handling at IES Manuscript and Documentation Center. Under this topic the items covered are, a brief introduction about the historical background and organizational structure, the type and size of the collection at IES Manuscript and Documentation Center, the major functions of the Center, its major users and the type of the services given to them, equipment holdings, staff and budget of the Center. The second major issue relates to the results of the survey conducted by distributing questionnaires to the users of the Center, for the purpose of assessing the existing information provision services, for use in proposing an alternative.

Except the last part (i.e. for discussion of the results of the survey) the descriptions made in all other sections of the chapter are based on the extensive discussion made with the head of the IES Manuscript and Documentation Center and selected members of the staff as deemed necessary. A discussion guide was prepared for this purpose (Annex 2) and given to them before hand so that they can prepare themselves to answer the questions. The major problem faced while conducting an interview was that after the first meeting the head of the Center, who is the only resource person, went abroad and returned back after two weeks. It was only possible to confine the discussion one week after his date of return. Due to this there was a delay of some three weeks which resulted in increased work load towards the latter time of the

study, especially limiting the number of modules dealt with in the prototyping and related testing. In addition to the interview personal observation and analysis of related documents were also employed while analyzing the existing system. The methodology employed to conduct the user survey will be described in the last section of this chapter.

3.2.1. ORGANIZATIONAL STRUCTURE

As indicated earlier, The Institute of Ethiopian Studies (IES) which constitutes the Research and Publications Department, the Library and the Museum, was established in 1963. Ever since this time, it has been serving as one of the cultural preservation centers in the country. The general objectives of the institute include (Tadesse 1990, 1)

> "conducting, promoting and coordinating research and publication on Ethiopia with special emphasis on the humanities and cultural studies. It also carries the responsibility of preservation of the cultural heritage of the country by collecting, cataloguing and displaying artifacts and items of historical value."

The administrative unit assists and facilitates the activities and programs of the three major units:- the Research and Publications Department, the Library and the Museum. As shown in figure 3.1., the Institute is administered by a director under the guidance of an advisory board drawn from inside and outside the university. The director of the institute serves as ex-officio, secretary of the Board.

As shown on the chart, the Manuscript and Documentation Center is organized under IES Library. The IES Library was established with the aim of collecting cultural material,

preserving, cataloguing and making it accessible for research and study. The establishment of the library was originally initiated by Professor Stanislaw Chojnacki who was then librarian at IES, and through collecting second-hand books on Ethiopia. At present he is working as a museum curator in IES. The Library was officially established in June 1963 based on the recommendation of Prof. R. K. Pankhrust, the former director of IES, by transferring ethnological collections of the former University College of Addis Ababa. The library was put under the Institute's administration until May 1967. Later it was merged with the Addis Ababa University Library System. This was made in order to centrally handle processes like purchasing, cataloguing, and reprographic services. The other reason is in order to widen the possibility of promoting the staff from lower position to a higher one. But again by August 1995 it was returned back to its original position and come under the Institute.

As indicated in the organizational structure, the Institute of Ethiopian Studies Library has five Departments.

I. MANUSCRIPT AND DOCUMENTATION CENTER

Manuscript and Documentation Centre is part of IES library and the main objectives of the Centre as it was specified in the aims and objectives of the library are.

a) To form and maintain/ preserve within its premises a collection of Ethiopian manuscripts in particular those of antiquity, or of special historical or linguistic interest and including also manuscripts of present-day authors.

b) To assist serious research on Ethiopian subjects, undertaken by:-

i. reputable scholars, whether Ethiopian or of any other nationality;

ii. members of the university teaching staff or visiting professors and lecturers.

iii. Addis Ababa University students of 4th year and above.

iv. employees of the Ethiopian Government Department or Agency under the direction of responsible officials.

The materials held by the Center are non-published and written on Ethiopia and the horn. The materials at the unit are of different types, like letters, manuscripts, memos, archival materials, photographs, slides, microfilms and microfiches etc. The main activities of the Center includes, acquiring material through purchase and donation; registering; describing; and giving services to users.

II. ETHIOPIAN LANGUAGE DEPARTMENTS:

This department is charged with holding materials printed in Ethiopian language. It consists of books and pamphlets in several Ethiopian languages, including Ge'ez, Amaharic, Tigrigna, Tigre, Oromo, Kunamigna, Afar, etc, as well as leaflets, Government announcements, prospectuses and other materials.

III. FOREIGN LANGUAGE DEPARTMENT:

This department maintains printed material on Ethiopia (works on Ethiopia) in foreign languages including English, French, German, Italy, etc. The department is said to constitutes the largest conveniently assembled collection on Ethiopia and the Horn of Africa.

IV. PERIODICALS DEPARTMENT:

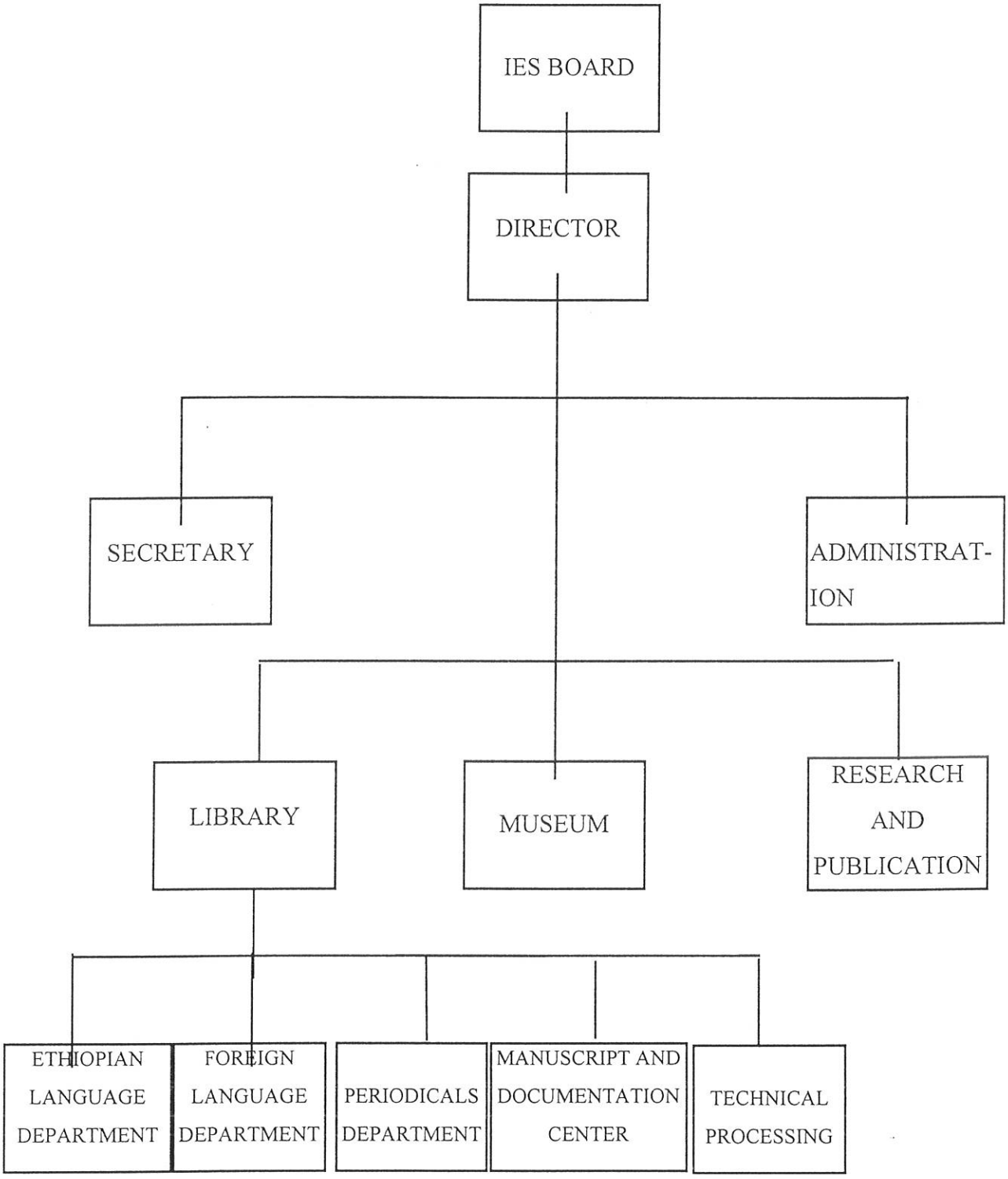
This department comprises all serial publications produced in Ethiopia and few periodicals on the country published abroad. The periodical collection includes also many rare items, such as first newspapers in Amharic and Tigregna, and large and unique assemblage of college, and school magazine.

v. Technical Processing and Administration

The IES Library collects almost every thing about Ethiopia or produced in the country, irrespective of subject, whether printed, mimeographed, typewritten, or handwritten. Some of these publications consist of only a few pages and can not therefore be kept with large books on the shelves. A practice has therefore been developed whereby items containing less than 50 pages are bound together. They are then labeled as miscellanies, and the contents of each volume are carefully listed. The library uses the Dewey Decimal Classification system, is modified to fit its specialized collection.

Generally, when we look at the departments it may seem that they functionally overlap. But from the discussions made, it seems that the division made are not based on functions alone, but rather on the type of the collection they hold to give service to users. In regard to naming departments, there is no written document which explains about how some of them are called department, others center and unit. But as we can see from the organizational structure all are at the same level under the library.

Fig. 3.1. Institute of Ethiopian Studies - Organizational Chart



3.2. TYPE AND SIZE OF THE COLLECTION

According to the classification made by the Manuscript and Documentation Center the types of the collections that the Center holds include: parchments or literature on leather or skin, scrolls that are roll parchments consisting magical prayers, archival documents, personal papers, reels of microfilm and microfiche on correspondences and letters. It also consists photographic archives, slides, post cards, and clandestine literatures which are produced and circulated but considered illegal by the state.

These collections are in different languages that include Ge'ez, Amharic, Arabic, English, Italian, French, Spanish and some other Ethiopian languages like Tigrigna, Welayitigna, Oromigna, etc. From the discussions made with the staff, although it is difficult to specify the exact figure, the largest proportion of the collection is in Ge'ez language which is followed by English, Amharic and Italian. Ge'ez happens to be the language from which Amharic (the official language of the Federal Government) was derived.

The size of the collection, by type is shown in the following table.

Table 1: The Type and Size of the Collection of Manuscript and Documentation Center at IES

Type of the collection	Size
Manuscripts on parchment and non published research papers and archival materials (in group)	2, 600
Scrolls (in piece)	500
Arabic language documents (in piece)	150
Clandestine Literature (in piece)	3, 330
Personal Letters (in piece)	10, 500
Reels of Microfilm and Microfiche on Correspondences, Letters and rare books (in piece)	9, 000
Photographic archive, slides, postcards and Miscellaneous (in piece)	40, 000
Folders of archival materials at "Wolde Mesquel" Memorial Research Center (in group)	10, 000

Source:- Annual Report of IES Manuscript and Documentation Center, Addis Ababa University, 1997.

From the discussion made it was observed that it is difficult to determine the annual growth rate of the collection since the materials acquired through purchase or donation do not have a regular pattern of flow. Due to this it is also difficult to predict the trend of the growth of the collection. But an increase in the collection size is noted.

3.3. MAJOR FUNCTIONS

3.3.1. Acquisition

Acquisition is a process by which the Manuscript and Documentation Center obtains materials of historical value. There are two ways of acquiring materials being practiced. One is through purchase and the other is through donation.

Acquisition through purchase usually starts with the evaluation of the materials coming from any one of the sources, like individuals, churches, institutions, etc. There are two major committees involved in the process of acquisition.

i) Expertise Committee

The members of this committee constitute academicians selected from the department of history and from the Institute of Language Studies (ILS). This committee is formed by the library only for the purpose of evaluating parchments. The committee assesses and evaluates the materials based mainly on the experiences of the members of the committee. On the basis of the assessment made the committee identifies those materials that are considered useful and makes recommendation for them to be purchased. The historical value of the material and its importance for research are the major factors which are considered at the time of assessment.

ii) Purchasing Committee

This committee is organized from different fields or departments like history, linguistics, library, etc. The committee takes the recommendation of the Expertise Committee, and decides on the price of the material and makes agreement with the person or institution (sources of the material). The purchasing committee serves not only the IES Manuscript and Documentation Center but also the Institute as a whole. It is set up and controlled by the IES board.

The second mode of acquisition is through donation. Three groups of donors are observed:

i) Individual Donors

These are individuals who are interested to keep their materials in the Institute's Manuscript and Documentation Center. They keep the manuscripts of their father, grandfathers, parents, etc.

ii) Non-Governmental Organizations

Under this category the major donor is the Society of Friends of Ethiopian Studies that was established in 1968. The main purpose for which the society was established is to raise fund, purchase manuscripts, paintings, icons, etc. and donate to the Manuscript and Documentation Center of the Institute. Currently there is another category of donors: the Wives of Diplomats

who are interested groups that donate money for the Society of Friends of Ethiopian Studies. Ethiopian Manuscript Microfilm Library (EMML) and SAREC are also other donors which fund the acquisition of Microfilm and Microfiche of manuscript coming from different European countries like Great Britain, Italy, France, etc.

iii) Governmental Organizations and Institutions

These are also other categories that donate to the Center materials of historical value for preservation. Some of these include Ethiopian Airlines, Commercial Bank of Ethiopia, etc. It is not by law or act that these governmental organizations or institutions donate materials. It is voluntarily and some times on the basis of the request of the Manuscript and Documentation Center.

3.3.2. Accessioning

After the acquisition of archival and manuscript materials through purchase or donation they will be registered in a register book or an inventory book. The record consists the accession number, title, type of the material (parchment, photograph, etc.), number of pages and brief description of the content, and date of arrival. Currently there are about eight volumes of inventory books each consisting varying quantity of items depending on the extent of description and the number of the sub-type of the items registered. These inventory or register books are used as one of the finding aids available to users in the existing system.

3.3.3. Arrangement

According to the discussions made with the head of the Manuscript and Documentation Center it was explained that the Center is not an archival institution in its real sense. There is no regular transfer of archival records and manuscript collection from the originating entity or organization to the Center for permanent preservation. The archival and manuscript collection of all types are usually collected randomly from sources not known by the Center before hand (i.e. there is no originating entity that regularly transfers records). Archival records already collected are not complete and do not fully represent the originating entity. If we take, for instance Commercial Bank of Ethiopia, we may find a single file from this institution and it may even be a single client's file. In such a situation the principle of provenance and original order could not be applied. We do not find multi-level arrangements like group, sub-group, repository, series, file unit or document level arrangements. The arrangement is simply according to arrival. This sort of arrangement will have an influence on the preparation of proper finding aids since the description is made on the basis of the principle of arrangement. The description made in any of the finding aids of the Center may not match with the arrangement, or the finding aids may not properly describe the material on the basis of the arrangement. This is creating problems in locating the materials needed by the user.

3.3.4. Description

General and detailed descriptions are made for the collection of Manuscript and Documentation Center at IES while preparing finding aids. The general description is given immediately when the material is acquired and registered in an inventory or register book as

described in section 3.3.2 before. This inventory or register book consists all the holdings of the Center. In addition there is also a guide for microfilm/fiche acquired from abroad which provides, a general description. There are also guides to photographic collection. These guides provide description at the group level (i.e. general).

The detailed description consists information on each piece of material and its content. Such kinds of information are provided by catalogues both in cards and microfilm, indexes for microfilm or microfiche materials brought from abroad and photographic lists.

Thus, inventory (register) book, guides to microfilm/fiche and guides to photographic collection prepared on cards provide general information. In order to get detailed information there is a need to look the card catalogue, catalogues and indexes in microfilm or fiche and photographic lists. But both the general and detailed descriptions made currently, serve as finding aids to users.

The finding aids consisting detailed description do not cover the whole collection. This is because, according to the staff, preparing such finding aid takes long time and there is also lack of trained manpower to do this. It was mentioned that for each type of collection, there is a need to have different type of specialists. Due to the diversity in type and language there is a need to have different specialists who are well versed with the archival and manuscript collection and have different language skills. The Center has found that it is very difficult to find such kind of persons. The other difficult problem that the Center is facing while cataloguing Ethiopian manuscripts is knowing the exact date on which the manuscript is written. This is because mostly scribers or writers do not mention the date. There is a need to

make a research to find the period in which such materials are written. Often, the writer may mention the name of a ruler or a religious father at the time of writing. Such kinds of descriptions are used as a source to identify the date. Here also there is a problem that Ethiopian Christian names are identical and it may be difficult to identify which ruler or religious father is mentioned. There is a need also to conduct a paleographic study of the Ethiopian scripts (i.e. their forms, types, etc.). Unless such studies are conducted, staff say, it is difficult to identify the exact dates. All these contribute to the delay in the preparation of finding aids consisting of detailed descriptions.

Until such detailed descriptions are made for the collection, inventory/register books and guides to photographs and microfilm/fiche are used as finding aids. Most of these give general information with limited access points. The problem with the inventory (register) book is that it consists information on materials registered on arrival. Currently, this is not arranged in any order and the materials are not categorized by their type. This makes searching of material needed by users so difficult.

Even if the detailed description is made, the catalogue or list or index which consist this detailed description is prepared manually and especially the card catalogue is hand written. Some times this may not be legible and difficult to understand the information written on the card. (The sample is attached at the end - Annex 3)

The other problem with some of the finding-aids in place, is that they do not provide multiple access points. For example, if we take archival materials, the user needs to have the subject together with the period in which the archival material was created since the arrangement of

such material is chronological and by subject. This is the only access point provided by the finding aid consisting information on archival collection.

3.4. MAJOR USERS OF THE MANUSCRIPT AND DOCUMENTATION CENTER

Currently, access to the collection of the Manuscript and Documentation Center at IES is restricted to the following groups of users:

- Staff of the University
- Final year undergraduate students.
- Post- graduate students
- Visiting scholars
- External users that include individuals coming from different institutions or organizations with a recommendation letter from their respective institutions or organizations.
- Members of Society of Friends of the Institute of Ethiopian Studies

Mostly, students and staff who are not in the field of social science and humanities do not use of the services of the Center since the collection type is not, to larger extent, directly related to their field of study.

3.5. SERVICES PROVIDED TO USERS

The following are the major services provided by the Manuscript and Documentation Center.

3.5.1. Reference Service

This refers to furnishing records for use in the search room. This is the major type of service provided by Manuscript and Documentation Center at IES. This is because of the fact that as a policy, the Center do not allow users to check-out the materials. The work load is not as such excessive since the number of users are limited. But, searching and locating material even for these limited number of users is time consuming.

3.5.2. Copy Service

On the basis of its copying policy, users can copy manuscripts in films. One of such policy is that users do not have the right to copy the materials to use it for commercial purpose. Thus, when users copy there is an agreement between the Center and the one who copy the manuscript not to use the material for commercial purpose. Such kinds of survives, as the staff mentioned, are not so frequent. Due to this, there is no additional staff assigned for this service and the facilities set aside for this are limited.

3.5.3. Exhibition

Exhibiting materials of the Manuscript and Documentation Center is made both within the Institute and abroad for the purpose of publicizing the collection at the Center. Exhibitions are made either within IES or out side. Both types of exhibitions require trucking records. When the exhibition is made within IES a record is maintained on the name of the responsible person, the reason for taking the material, quantity and date on which the material is taken. If the material is to be sent outside there is a record to be maintained on different aspects of the item and its current condition. If it needs treatment or maintenance this will be completed before it is sent. This also not a frequent phenomenon.

3.2.6. EQUIPMENT

Equipment holdings of the Center are summarized by the following table.

Table 2: Equipment Owned by the Manuscript and Documentation Center

EQUIPMENT	NUMBER
Personal Computer	1
Manual Micro film reader	2
Microfilm/fiche reader with printer	1
Microfiche reader with printer	1
16 mm Microfirlmer	1

As shown in the above table there is only one PC with 386 processor at the Center which is mainly used for office duties, to prepare an index and hold information on some type of collection (e.g. personal papers) using word processing. Microfilm/fiche readers or printers at the Center serve users of Microfilm/fiche. They are limited in number as they are compared with the number of users.

3.5.7. STAFF

The following table summarizes the number of staff of the Manuscript and Documentation Center at IES together with their skill and qualification.

Table 3: Staff of IES Manuscript and Documentation Center with their Skill and Qualification

Skill	Qualification	Number
Archivist	BA in Ethiopian Language and Literature and MA in Archives and Paleography and Diplomatic	1
Typist	12 grade complete	2
Library Assistant	12+2	1

From my personal observation and the discussion made with the staff the number of staff is not adequate. There is only one professional staff at the Center and it is possible to say that it is a one man-department. And, as mentioned before, due to shortage of professional staff, it has not been possible to prepare finding aids which consist detailed description and which are efficient in giving full access to the holdings to users. The Center requires different

specialists who are able to properly study the nature of the collection, the language and the period in which it was created and describe them in appropriate finding aids. In the search room, there is only one library assistant serving the users. From my personal observation, the work load is not as such a critical problem in the search room. The major problem is lack of trained staff who is well versed with the type of the collection and its proper location. This will affect the quality of the service that the center is giving to users.

3.5.7. BUDGET

For buying different historical materials, the Society of Friends of the Institute of Ethiopian Studies is the major source of fund. There are also other local and foreign donors as are stated in section 3.3.1. that support financially the Institute and the Center for the same purpose. For salaries and other administrative costs, the Center uses budget allocated from the Federal Government.

3.6. USERS VIEW ABOUT THE SERVICES OF THE CENTER

"Some kind of user involvement in systems projects is critical to the successful development of computerized information systems."[Kendall, 1995] Accordingly, determining information requirements of users is an important task in the development of the new system." Among the tools used to define information requirements of users are: sampling and investigating hard data, interviewing, questionnaires, observation, and even prototyping." [Kendall, 1995]. The tool that is used in this study to determine user requirements is questionnaire.

The questionnaire was constructed on the basis of reviewing related literature and works done previously in the area of user survey. (Annex 1) The questionnaire was pre-tested. "Pre-testing the questionnaire yields data concerning instrument deficiencies as well as suggestions for improvement" [Gay, 1981]. Modifications, like clarifying, adding and excluding questions were made on the basis of the comments made by the respondents who are selected from the intended population for the pre-test purpose. The basis of selection of these respondants were suggestion of the staff of the Manuscript and Documentation Center and including individuals who have related works to the Center's duty. The survey was mainly conducted to:-

- identify different categories of users of the Center and obtain an overall perspective of these users towards its services and facilities through which they may mention the problems they are facing while using the system. An attempt has also been made to know the perception of users towards the computer based system in solving the problems they are facing.

- examine the information requirements of different categories of users of the Center so that the proposed system will be tailored to suit their requirements.

- identify the access methods and access points that users most frequently apply while searching materials they need from the Center so that it helps in designing the database.

Based on a preliminary investigation made for the purpose of understanding this study the major users of the Center come from the fields of History and Ethiopian Language and Literature. Taking this in to account the population in both departments determined and this was about 127. Due to shortage of time and limited financial resource it was decided to sample this population rather than taking the whole. A Proportionate stratified sampling was applied where sampling from the different strata was made to be proportional and the sample size from each stratum to be proportional to the population size of the stratum. This rate was determined to be 50%. This was made deliberately in order to make the sample more representative. In addition to this, having different strata of the population and taking a sample from each stratum has also an advantage since samples can constitute a more heterogeneous population when they are combined. This was believed to ensures adequate representation of different groups of the population in samples which increase the level of accuracy[Nachmias, 1992]. The population and the sample size across different categories of users are shown in the following table.

Table 4: Population and Sample Sizes by Categories of Users

Categories of Users	Population*	Sample Size (50%)
Fourth Year (final year) Students	61	30
Post Graduates	30	15
Staff	36	18
TOTAL	127	63

*Source:- 1. Addis Ababa University, Academic Program Office. Academic Staff List (1997/98).

2. Addis Ababa University, Office of the Registrar. Statistical Report (1997/98).

There was one external user and two foreign scholars during the survey time and they all are included in the sample. All together, the total sample size came 66.

While distributing the questionnaire, list of students and the Academic Staff list were used as sampling frames in selecting sample of students and academic staff.

Although a great deal of effort was exerted to get a 100% response, out of the 66 sample users surveyed, 48 (72.7%) responded. Some of the reasons of not getting full response were that some of the respondents completely forget about the questionnaire, others lost it or purposely ignored it. But according to Babbie (1992) " a response rate of atleast 50 % is adequate for analysis and reporting; a response of at least 60 % is good; and a response rate of 70% is very good." Thus, a response rate of 72.7% is classified in the very good response category and thus, formed the basis of the analysis presented in the following paragraphs.

Out of the 48 who responded, 26 (54.2%) were fourth year students, 7 (14.6%) were Post Graduates, 12 (25%) were University staff, 1 (2.1 %) an external reader and 2 (4.2 %) foreign scholar. According to the above result fourth year students and the University staff seems to be major users of the Center.

On the frequency of use of the services of Manuscript and Documentation Center, the following table summarizes the response rates across each frequency level.

Table 5: Frequency of Use of Manuscript and Documentation Center by Respondents

Frequency of Use	Number of Users	Percentage
Frequently (once a day)	25	52%
Sometimes (once a week)	12	25%
Rarely (once a month)	8	16.7%
Occasionally (once in a while)	3	6.3%
TOTAL	48	100%

As we can see from the above table, 52 % of the respondents use the Center once a day, 25% once a week, 16.7 % use rarely (once in a month). This shows that the largest number of respondents (77%) use the Center at most once a day and atleast once a week. This implies that the respondants being frequent users helps to get appropriate and more accurate answers than those who use less frequently. Thus, the response got was from more frequent users who give more accurate answer.

For question relating to the purpose of coming to Manuscript and Documentation Center, 46% of them (most of which are undergraduate and post-graduate) responded that they come to the Center to do research for term paper or an essay. Details are shown in Table 6.

Table 6: Purpose for Coming to the Manuscript and Documentation Center

Purpose	No. of respondents who ranked as No.					
	1	2	3	4	5	6
Find material for a course	1	12	8	1	1	2
Read for general knowledge	1	7	7	4	2	3
Do research for term paper/senior essay	22	3	1	2	1	1
Use the library facility or reading own material	-	-	2	1	3	-
Refer material for decision making	-	-	-	1	1	-
Do research for article contribution	9	3	2	2	1	2

The second ranking is to find and read materials for a course that accounted for 25% of the respondents. This constitutes students and staff. The third ranking is to refer to materials for general knowledge that accounted for 14.6% of the respondents. These constituted students, staff, external readers and foreign scholars. All the respondents who come for doing research for article contribution are from the academic staff.

The above figures show that the largest number of users come to the library for the purpose of doing research which coincides with the objective of the Center.

The other question relates to ranking the services that the respondents mostly prefer. The following table shows the response rates for each major type of services.

Table 7: Ranking of Services of the Center Preferred by Users

Services	No. of respondents who ranked as No.			
	1	2	3	4
Reference service	26	2	4	1
Bibliographic Services	10	18	5	2
Information Services*	4	4	6	1
Making copies of Records	6	10	-	2

As we can see from the above table, the most preferred service is reference service (i.e. furnishing records for use with in the search rooms) which accounted for 62%, followed by bibliographic service (i.e. providing information on published materials) (37.5%) and making copies of records (20.8%). This indicates that the computer system that will be developed should assist users in the search room where reference service is given, say for instance, by providing the bibliographic service.

Users were also asked to rank the type of collection that they prefer to use most. The following table indicates the number of users who ranked each collection under each ranking scale.

* The Center give general information like the type of materials available at the Center when inquiry comes from individuals and institutions.

Table 8: Ranking of Collection Type by Users of the Center

Collection Type	Number of Respondents who ranked as No.									
	1	2	3	4	5	6	7	8	9	10
Manuscripts (Parchment and paper)	13	21	5	2	2	-	1	-	1	1
Correspondences (memo)	-	3	6	-	2	1	-	-	-	-
Diary	1	2	2	1	1	3	-	2	-	-
Photographs	-	-	6	4	3	1	-	1	1	2
Sound recordings	-	-	-	-	-	1	2	-	-	-
Report	-	4	1	-	2	1	1	-	-	-
Microfilms and slides	6	7	16	4	5	1	2	1	-	-
Clandestine literature	-	-	1	-	-	3	-	-	-	2
Research materials	28	5	2	-	-	2	-	-	1	-
Personal papers	-	4	6	6	6	-	-	-	-	-
Minutes of a meeting	-	1	-	2	-	-	1	2	-	-

As we can see from the above table, 58.3 % of the respondents prefer to use research materials which coincide with the purpose for which most users come to the library. Manuscripts (43.8%) and Microfilm and Slides (33.3%) ranked second and third respectively. This may indicate that priority should be given to the most preferred when considering the development of a computer assisted finding-aids.

Respondents were also asked to rank the access methods and the access points that they most frequently use while searching materials they need. The following table summarizes the response rates under each ranking scale.

Table 8: Ranking of Access Methods and Access Points by Users of the Center

Access Method	Number of respondents who ranked as No.				
	1	2	3	4	5
Consult Card Catalogue	34	8	3	-	-
Use Register Book	11	26	10	-	-
Ask Library Staff	6	11	17	-	-
List of citations in other material	3	-	1	-	-
Ask people who have used the collection	1	-	-	-	-
Access Point					
Subject	20	7	-	1	-
Date	8	5	-	3	-
The name of a person/record creating entity	8	14	-	-	-
Geographical area	-	-	3	3	2
Description of the document	2	3	11	-	2

As we can see from the table, from the methods of accessing information consulting card catalogues ranked first (70.8%), followed by using register book (54%), and asking library staff (35.4%). This indicates that while developing a computer assisted finding-aids, the content need to be a detailed description of the items that is similar to the card catalogue. There may also be a need to transform the contents of the inventory or register book in to an electronic format so that users may use it to get a general information about the collection.

From the access point, using subject as search term ranked first and accounted for 41.67%, followed by the name of a person or record creating entity (29.2%), and description of the documents (23%). Most of the respondents explained that lack of subject catalogue made

searching difficult. Thus, the system to be developed need to allow users to access materials by subject.

In relation to the use of computers as a tool, all respondents were positive with regard to its contribution to minimize the problem. Users were also asked which finding aids they want included in the computer database. The following table summarizes the ranking of the finding aids to be included in the database.

Table 9: Ranking of Finding Aids to be Included in the Database

	Number of respondents who ranked as No.				
Finding-Aids	1	2	3	4	5
Catalogues	7	21	6	-	-
Indexes	2	7	9	2	-
Subject Lists	36	5	2	1	-
Guides to Microfilms	3	3	15	3	1
Guides to Photographs	-	3	-	6	1

As we can see from the above table, 75% of the respondents preferred subject list to be included in the database, followed by catalogues (43.8%) and guides to microfilms (31.3%). This shows that greater emphasis should be given to the subject lists while the database is designed. As we have seen in the previous analysis (Table 9), using subject as a search term ranked first which coincides with the priority given by users here to include subject lists in the database.

In general problems reported/identified by both the staff in handling and providing information and the user in accessing materials are summarized as follows.

- Problems related to the finding aids include that descriptions are incomplete. Some of the search terms that users need to refer to or by which they want to access the information are not available in finding aids and thus, they provide limited access point. What is more, most of the finding-aids are handwritten and have problem of legibility and clarity (a sample is attached in Annex 3). Some of the finding aids like guides to microfilms and photographs are not accessible to users. Physically, the card catalogue is not standard and it is large in size which made it inconvenient for searching.

- The register book which is the only finding aid until a card catalogue is prepared, consists of list of items registered according to their arrival. The list is not categorized by item type and not indexed by any key term.

- There is poor organization or arrangement of the collection. The descriptions made in the finding aids sometimes fail to match with the arrangement. The description may be in English while the arrangement may be in Amharic, which makes the location of required materials so difficult, especially for foreign users who may not be familiar with the order of Amharic letters. In addition to this, there is misplacements of materials.

- There is a very poor housing of the collection. Due to lack of enough space, items are being put one on top of the other. In addition to this the collection is exposed to dust and humidity since the building does not suit for the housing of archival and manuscript collection which consist of fragile materials.

- There is no systematic recording of movement of materials for purposes like exhibition, reprography and the like.

- It is difficult to take inventory item by item and piece by piece due to the nature and volume of the collection and shortage of staff.

- There is lack of trained staff who can serve users efficiently. Even most of the available staff are not efficient in locating the material since they are not well versed with the unique type of the collection that the Center holds.

- There is a problem of security- no special focus need to be given to some of rare collection of the Center in guarding them from loss.

In addition to stating problems of the Center users have also suggested solutions that can help to improve the services to users. Almost all respondents believe that computerization may help to solve all or most of the problems stated. While doing this, they suggest that due emphasis should be given to prepare subject catalogue. In addition to these guides to microfilms, indexes and guides to photographs have also been suggested as important. Provision of information on holdings of the Center in printed form, having complete card

catalogue with different access points, CD-ROM services, additional microfilm readers, proper staff training, proper user's orientation, additional reading rooms and extended opening hours have also been recommended by users.

CHAPTER FOUR

4.0. PROPOSED DATABASE SOLUTION

The existing system's operations relating to information handling, problems and their causes have been documented in the previous chapter. The purpose of this chapter is to describe an alternative system that aims at solving the problems identified by both the staff of the Center and the users at the time of analysing the existing system. In this chapter, the need for computerized system, major system requirements which are related to data management and processing; basic concepts of object-orientation and its application to the design of the database for the manuscript and archival collection; and the various database designed for the new system will be discussed.

4.1. THE NEED FOR COMPUTERIZED SYSTEM

The following are the major problems related to indexing quality that currently are existing at the Center which calls for the application of computer.

1. The major problem of all finding aids is that they do not provide access by subject which users mostly prefer to use it while searching.

2. As it was specified previously, the major finding aid at the Center is inventory or register book which consists records of newly acquired materials registered according to arrival.

This finding aid has two major problems which has created a major access problems at the Center.

- It is neither categorized by collection type nor indexed by any key term.

- The only access point provided by this finding aid is title and serial number. The serial number do not give any information related to the collection type or its content. It is not possible to access information by subject or any other key term. This do not allow multiple access point.

3. Some guides provided as finding aids, like guides to photographs provide only box/album/frame/envelop number as a major access point not providing other points like date, topic or originators.

4. Those descriptions made for microfilm/fiche provide only reel or series number and source (country or institution) as a major access point. This doesn't provide access with subject that users mostly require.

5. Personal papers can be accessed by the name of a person or originating entity, date, subject, etc. But the only provision made for accessing such type of collection is by the name of a person or originating entity. Other access points are not provided as primary access points in finding aids. But users may want to access the information by date and subject in addition to name of a person or originating entity.

6. The finding aids of different type of collection are found at different places and in different media (paper, card, microfilm/fiche) which doesn't allow to access related information on different media at the same time.

7. Control over the growing size of collection of all kinds is not easy due to non-indexed inventory or register book.

8. There is no systematic way of handling trucking records for movements of materials for purposes like exhibition, treatment and reprography which can allow easy identification of the material which have moved, returned, or still not returned.

All problems stated above are related to indexing quality which is being faced by the Center which can be minimized with the application of computers. Computerized system can help the Manuscript and Documentation Center at its present stage of development in the following ways:-

- It can play an essential role in handling information which has been provided by the major finding aid (like inventory/register book) by presenting that information in different ways (i.e. re-ordering it chronologically, alphabetically, or by subject matter).

- Information on non-text media (photographs, microfilm records, slides) can be retrieved under a number of different headings, such as originators, date or topic.

- A computer based system which can handle a summary description of all holdings allows easy control of them for administrative and management purpose. This control enables the management of the Center to know the change of holdings, predict the trend, and prepare the necessary facilities required by the increasing collection.

- Cumulative indexes combining data from a number of finding aids (inventory or register book, guides, lists, etc.) is possible under a computerized system providing more precise searches and a greater rate of 'hits'.

- The entire content of the database consisting different finding aids can be provided in printed form or on microfiche which can substitute the existing hand written finding aids.

- It can give ready access to the information provided by different finding aids covering a great number of fonds at speed, with the facility for searches by key word and by combination of key words using Boolean operators across several fields.

- There is a chronic shortage of staff and the computer can handle processes like supporting functions related to generating indexes for finding aids, saving energy of the staff and reducing back logs of work.

- It can help to input required information in fully consistent and standard ways which can help users to properly search and retrieve.

In addition to computerization an involvement of professional staff is necessary to properly describe materials following standards or manual of archival description.

4.2. SYSTEMS REQUIREMENTS

From the details of the user requirements documented in the previous chapter, the following are summarized for consideration in the design.

- In relation to collection, there are various types, like parchments, personal papers, photographs, slides, postcards, etc. They are in paper form or in microform. The language is also diverse. Various types of records need to be maintained for these collection. These records include accession related, records needed to provide finding aids to users, and records related to the movement of materials. Collections like photographs, slides and postcards require multimedia application to handle both textual information and the image in the database. In addition to this, the core groups of historical archives and manuscripts can be electronically processed and stored in a computer with their index data used for retrieving them.

- In relation to search facilities, users need to have different access tools that can provide multiple access. These tools include, indexes, subject lists, machine readable catalogue, lists, calendars, and guides. Users highly require to have subject lists since they mostly use subject as a major access point. The name of a person or record creating entity and date of

creation are also other major access points. Thus, users require to be provided with query searching and selective searching by field or key word.

- One of the major output of the database need to be provision of its content in printed form or microfiche. These outputs include, catalogues, indexes, abstracts, accession lists, current awareness bulletins, information analysis and consolidation products, etc.

- In relation to the environmental requirements the Center need to have more personal computers in addition to the one existing in the Center. Trained manpower, better housing and storage facilities must be fulfilled in order to properly implement the new computer based system.

- The Center has to get Internet connection so that the database will be accessed by the remoter users who have got Internet connectivity.

- Processes that are involved in operations of the Center which need to be supported by the database solution are depicted as follows.

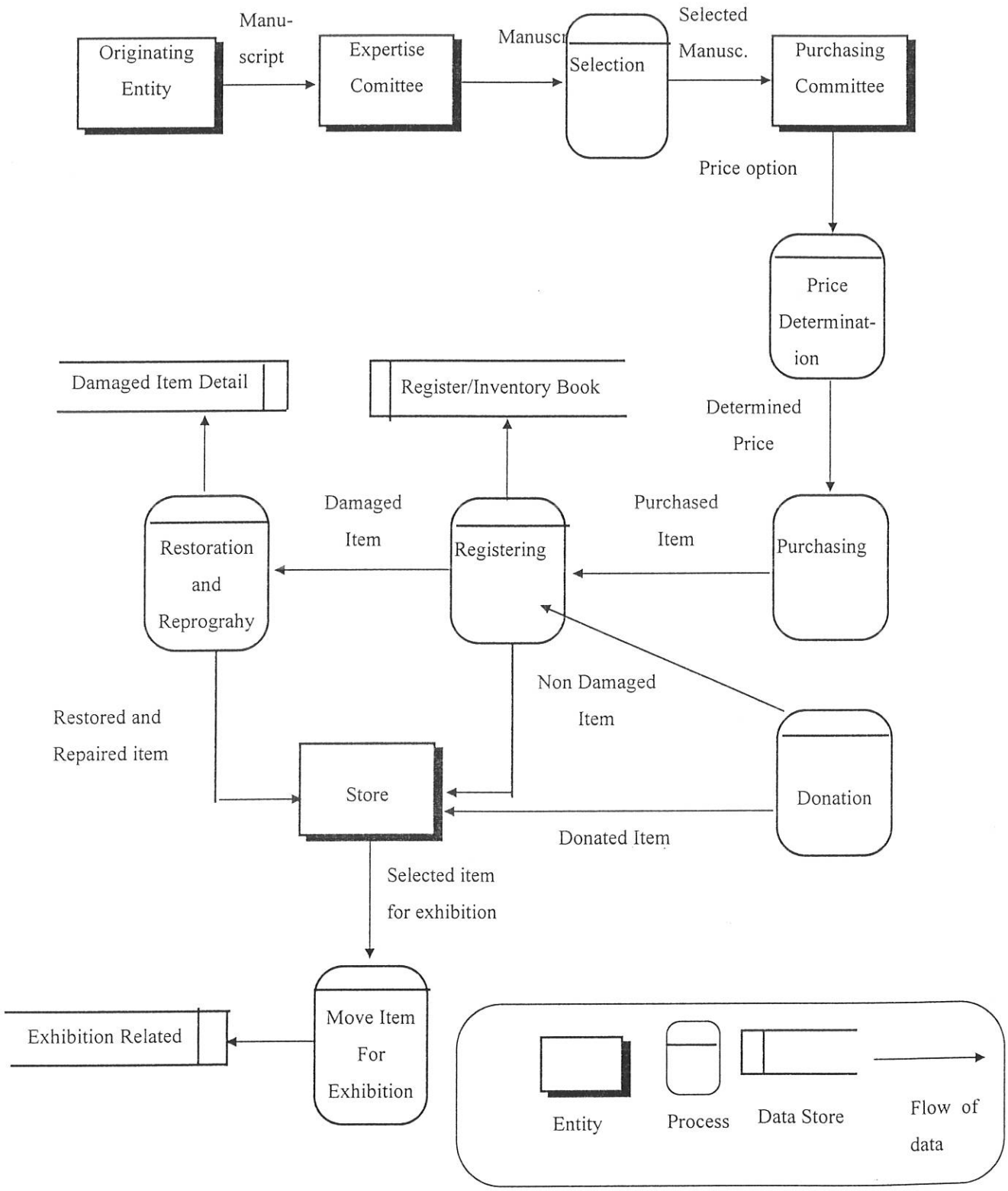


Fig. 4.1. Data flow diagram for functional processes of the Center

As indicated above, the acquisition process involves the decision both of Expertise Committee which evaluates the material and Purchasing Committee which determines the price. Those materials which get approval will be acquired through purchase following the normal administrative routines. These acquired materials including donated ones will be registered in the inventory or register book in which a general descriptions are given.

Those records arriving with damages are passed on to restoration and reprographic personnel for appropriate diagnosis and repair. During this time a trucking record will be maintained by registering title of the material, its type and quantity.

In the mean time collection also move for exhibitions. The exhibition may be within the Institute or outside. If the exhibition is within the institute, there is a responsible person assigned for this duty. While the person takes the materials, same will be noted by the department head which consists of the name of the individual, where the material is taken, the reason for taking the materials, accession number, total number of the material taken. But if the exhibition is out side the country there is an examination form to be complete before the loan is made. All information related to the materials including their current physical status will be registered.

In relation to inventory, it is not taken regularly due to the unique nature of the collection (i.e. single paper, photographs, slides, postcard, films, memorandum, leaflets, notes, etc.) It is very difficult to take inventory of each of these small items given the limited number of staff. The arrangement is also non systematic. What the center does is based on the inventory book it

checks the existence of the materials at the group level. Due to this problem it is difficult to know the actual existence of the material at the time when the Center wants to acquire. A multi level arrangement of the collection may solve such problems.

4.3. DESIGN APPROACH

Object technology, as mentioned by Kemerer, 1997 " is aligned with many current technology trends, like event driven graphical user interfaces, multimedia systems (voice, imaging, animation), and highly parallel processing (eg. for full text searching and retrieval)."

Object orientation is a new technology whose major principle is representing a real world thing or concept as an object. The two major principles that object oriented approach follows while structuring systems are storing data and related operations together within objects (encapsulation) and sharing commonalties between classes of objects (inheritance). This current technology is aiming at improving methods of analysis and design of a system. While explaining the major advances made by object oriented approach as compared to the traditional approaches, Kemerer, 1997 mentions that " object oriented design is a radical change from both process-oriented and data-oriented methodologies. Important dimension of object oriented design, not addressed by conventional methodologies relate to the detailed definition of classes and inheritances, class and object relationships, encapsulated operations, and message connections."

The following paragraphs state the application of the object oriented approach in this study.

Manuscript and archival collection is taken as real object for which we need to store data and manipulate it using the operations related to them. In Object orientation these data elements and operation are packaged within an object (eg, Scrolls, Parchments, etc.).

For instance, in designing the database for manuscript and archival collection, we have scroll as an object which has different properties about which we store data and different operations to be performed on it like making additions through acquisition. We have to put these two related features of a scroll with in the object scroll.

Classes are templates for generating objects. A class definition specifies the fields, called data members (also called instance variables) and the procedures (called methods) that each of its instances will have. A class helps to put many objects of the same type together by defining general characteristics of that type once in a class. In this case an object becomes an instance of a class consisting the shared characteristics contained in the class and the unique characteristics contained in the instance. Details of the class include the specification of the method. Parchment, for instance, is a class which put all written objects on leather together so that all of them share their common properties defined ones in the super class called Parchment. The subclass inherits data types and methods and it also has methods and sometimes data types of its own. This avoids redundancies, simplifies process of reuse, makes possible to concentrate on the general class at the time of modification making the process easy. For example, the Parchment class that we specified above is considered as a super class and Book Parchments and Scrolls are taken as sub-classes derived from the Parchment class. We define common variables of the two sub-classes in the super class (Parchment) and define their own unique attributes within each sub-class (Book Parchment and Scroll).

The relationship between objects can be static or dynamic. The former refers to relations existing over a longer period and the two objects know about to each other's existence. While in dynamic relation two objects communicate each other through messages. The message in dynamic relation has a role to change in the receiving object's behavior. The static relationship is expressed in terms of inheritance association ("Is A" relationship), aggregation or whole part, instance association and attribute relationship. From this we can understand that objects, in addition to containing data, they can receive, interpret, respond to or send messages. An attribute is not needed to identify an object. Each object has a unique identifier which is not part of the representation, but which is used as an internal reference. Its existence makes defining artificial identifier attributes (key) unnecessary.

In the traditional systems development the basic principles stated above, like inheritance and encapsulation are rarely used since they are not used as a primary structuring principles. In addition to this in object oriented system there is active and explicit communication between entities. This implies that the structured design use function oriented decomposition rules, resulting in a set of procedure oriented program modules. Object oriented design methodologies by contrast, employ an object oriented decomposition resulting in collections of methods encapsulated within objects. This makes modules to be free-standing which means that they can be rewritten if desired without affecting the other parts of the program. Modules can also be linked together and reused as necessary.

Object oriented data modeling provides techniques appropriate for the analysis of rich data. As Hervey, 1996 explains "one of the most significant features of object oriented data model is its ability to represent arbitrary and compound objects in contrast to the more structured and

uniform relational model." Conventional DBMSs were designed for homogeneous data that can be easily structured in to predetermined data fields and records. But drawings, images, photographs, voice, and full motion video in a relational system require extensive programming to translate these complex data structures into tables and rows. The advantage of the object-oriented approach is that the database system has a better handling of these data types, the operation and behavior through well designed classes.

In addition to the forgoing, the consideration of this technology for use in this work has the following main reasons as a basis.

- The Center consists a wide variety of collection types including parchments, scrolls, personal papers, archival records, photographs, postcards, slides etc. These types of collection consist heterogeneous data types (text, numbers, images, etc.) which can not be easily structured in to predetermined data fields and records. Object orientated approach is more appropriate to handle such kind of data.

- Inheritance which is the basic feature of object-orientation helps a lot in avoiding data redundancies which is a major problem observed in the description of the manuscript and archival collection. For instance, we have two types of Parchments, the Book Parchment and Scrolls. Both share about 15 attributes in common. With inheritance it is possible to define common attributes in a super class (eg. Parchment) and unique attributes in sub-classes (Book Parchment and Scroll).

- The multilevel description which consists description made at the group level, subgroup level, series level, file unit or document level, also calls for the application of the class inheritance feature of object oriented approach.

4.4. THE PROTOTYPE DATABASE

The following are the major considerations that guided the design of the prototype database proposed for the IES Manuscript and Documentation Center.

1. The maintenance of accession records.
2. The provision of finding aids consisting the detailed description of parchments, personal papers, archival records, photographs and slides, post-cards clandestine literature.
3. Trucking of the movement of collection for purposes like exhibition, treatment and reprography.
4. Display the collection by title or name.
5. Provide printed catalogues or indexes.

The steps followed in designing the prototype database are listed below.

i. **Write use cases which are mini-scenarios for the system**: this is based on the users requirements which are identified at the time of conducting the survey.

ii. **Developing Collaboration Diagrams** which depicts classes, subsystems, contracts and relationship between classes and subsystems. While doing this the following steps were followed:

   a. Classes were identified.

   b. Responsibilities (Methods) that help the class to do its work were also been identified based on the requirement specification.

   c. Subsystems were also identified by looking for strong coupling between classes.

d. Contracts which are groups of high level responsibilities or public services that a sub-system or a class need to provide to other classes were identified.

iii. **Classes were placed in the inheritance hierarchy.**

In this exercise the identification of classes, their attributes, responsibilities, subsystems, and contracts have been the major duties.

4.4.1. USE CASES

Use cases as they are described by users are related to:

- acquisition and accessioning
- provision of guides to microfilm and photographic collection
- detailed description to be maintained for the provision of finding aids
- giving services to users
- maintaining records on movement of materials
- maintaining information related to inventories

The details of the use cases are presented as follows:

USE CASE - MAINTAIN ACCESSION RECORD

When items are acquired and arrives at the Center they have to be registered. They should consist descriptions at the group level and constitute information like accession number, title, type of the material, quantity and brief description of the content and date of arrival. The list need to be classified by collection type and need to be indexed by accession number and title. Report need to be generated in relation to this, to know the additions made. A printout of the accession record should be provided since it can be used as one of the finding aids until the detailed description is made.

USE CASE- PROVISION OF GUIDES

Guides to microfilm and photographic collection need to be provided. Guides to microfilms/fitch may include source (name of the country), institution (eg. Public Record Office, Foreign Office), reel number, serial number, brief description of the content. Guides to photographic collection need to include box/frame/album/envelop number, and range of accession number of photographs in each of them and total quantity.

USE CASE - PROVISION OF FINDING AIDS WITH DETAILED DESCRIPTION OF THE COLLECTION

A detailed description should be maintained for each type of the collection consisting every relevant information on the material. This has to be indexed by different entries so that users coming with different information can identify the material easily. While doing this subject lists should be generated since users mostly use subject while searching. Indexing chronologically and by name of a person or record creating entity is also another provisions to be made at the time of preparing such descriptive finding aid.

USE CASE- ACCESS CONTROL AND RENDERING SERVICES

At the time of giving services, the name of users or their ID should be cheked to verify that whether he/she is eligible user of the Center or not. If the user is eligible the enquiry of the user will be processed by checking the finding aids, whether the required information is available or not.

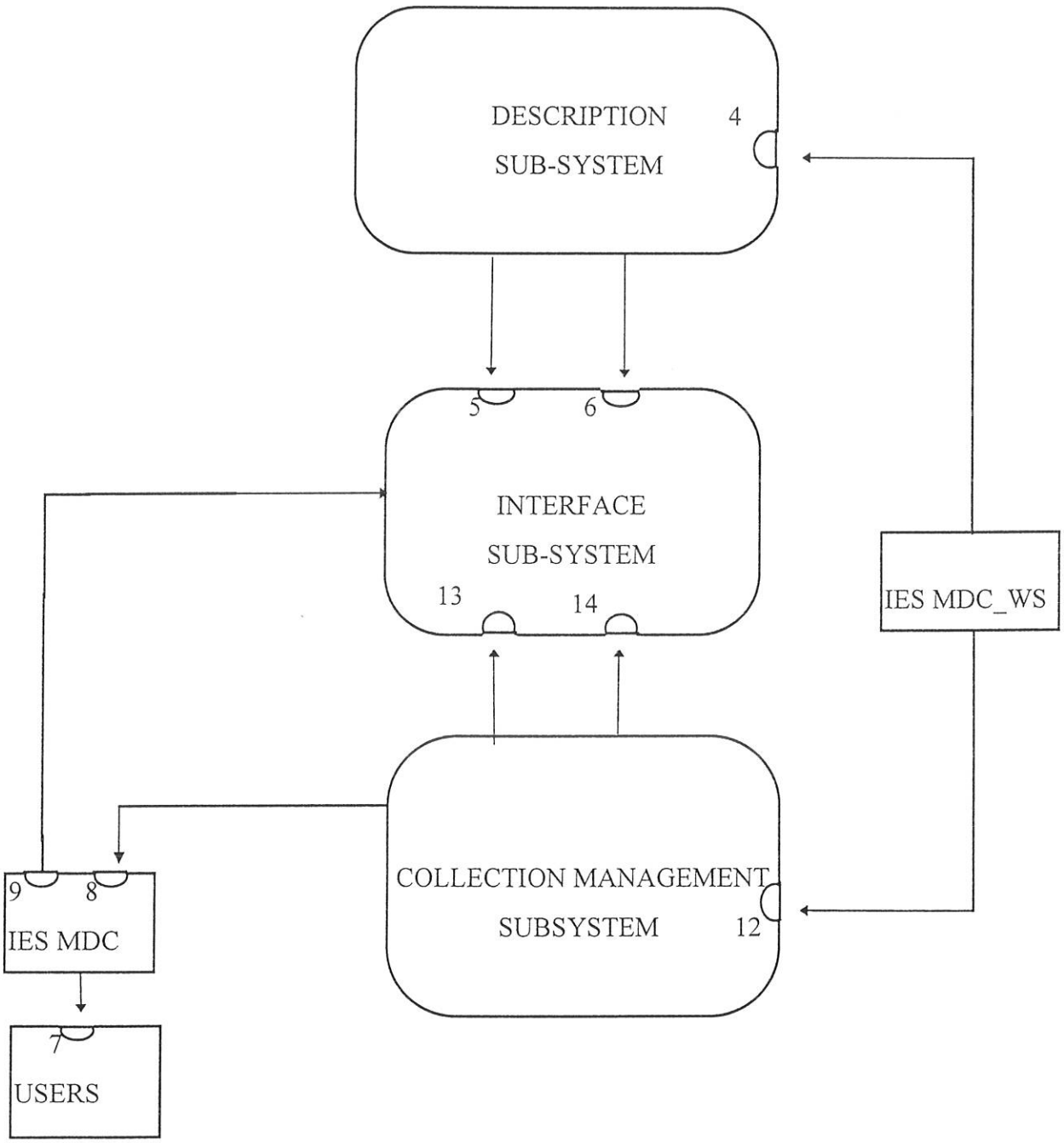
USE CASE - MAINTAINING RECORDS ON MOVEMENT OF MATERIALS

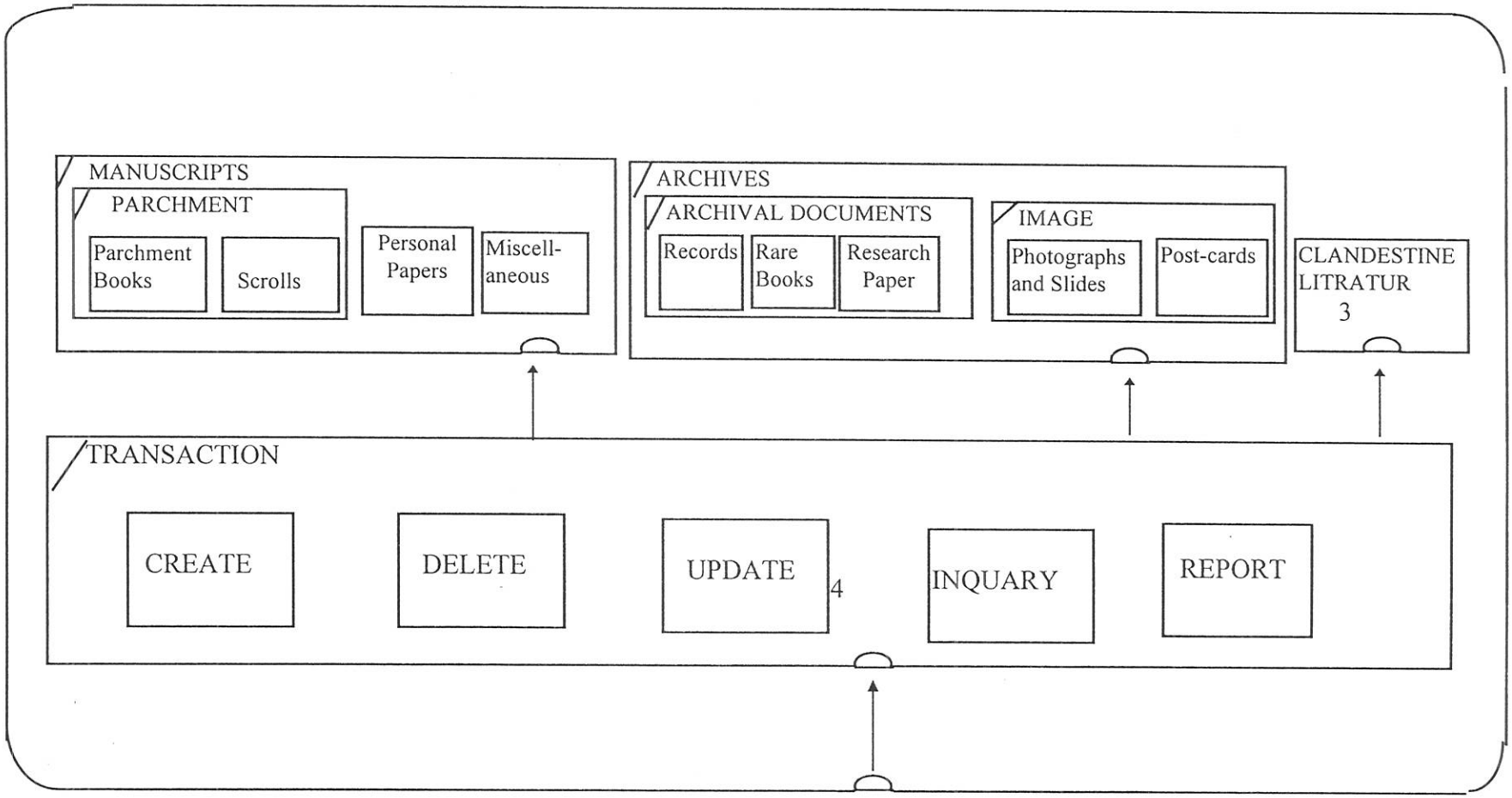
A record should be maintained while moving materials for different purposes like exhibition, restoration and reprography. If the exhibition is within the Institute only the title of the material, its type, quantity, and the name of the responsible person will be registered. But if the exhibition is outside, all details of the physical condition of the material should be filled in addition to the above stated information. There is a need to attach comments as to whether there is a need to restore or repair before sending it.

USE CASE- MAINTAIN INFORMATION RELATED TO INVENTORY

Inventory related information should be provided indicating list of materials and the total quantity held by the Center.

Figure 4.2. Collaboration Diagram




MANUSCRIPTS
PARCHMENT
Parchment Books
Scrolls
Personal Papers
Miscell-aneous
ARCHIVES
ARCHIVAL DOCUMENTS
Records
Rare Books
Research Paper
IMAGE
Photographs and Slides
Post-cards
CLANDESTINE LITRATUR
3
TRANSACTION
CREATE
DELETE
UPDATE
4
INQUARY
REPORT

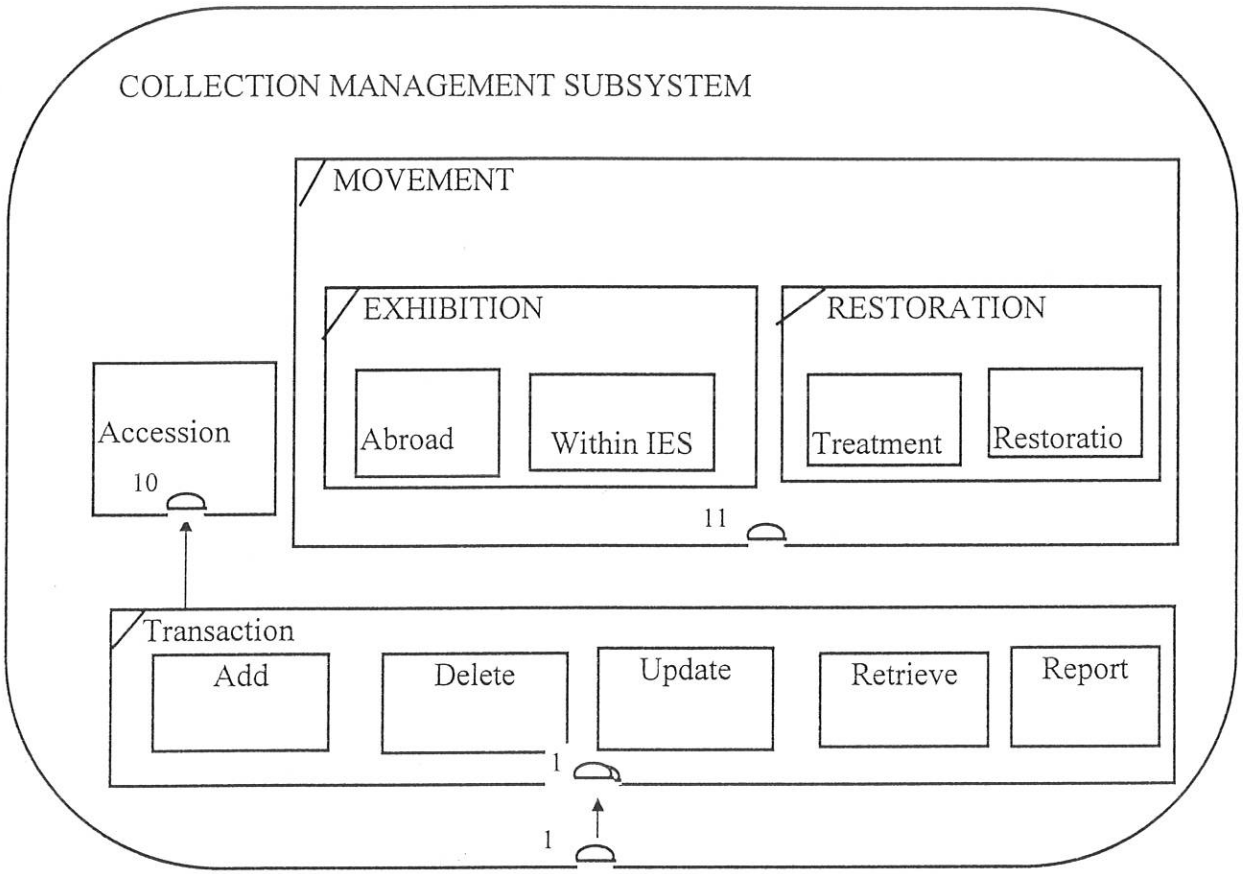


Fig. 4.5. **Collection Management Sub-System**

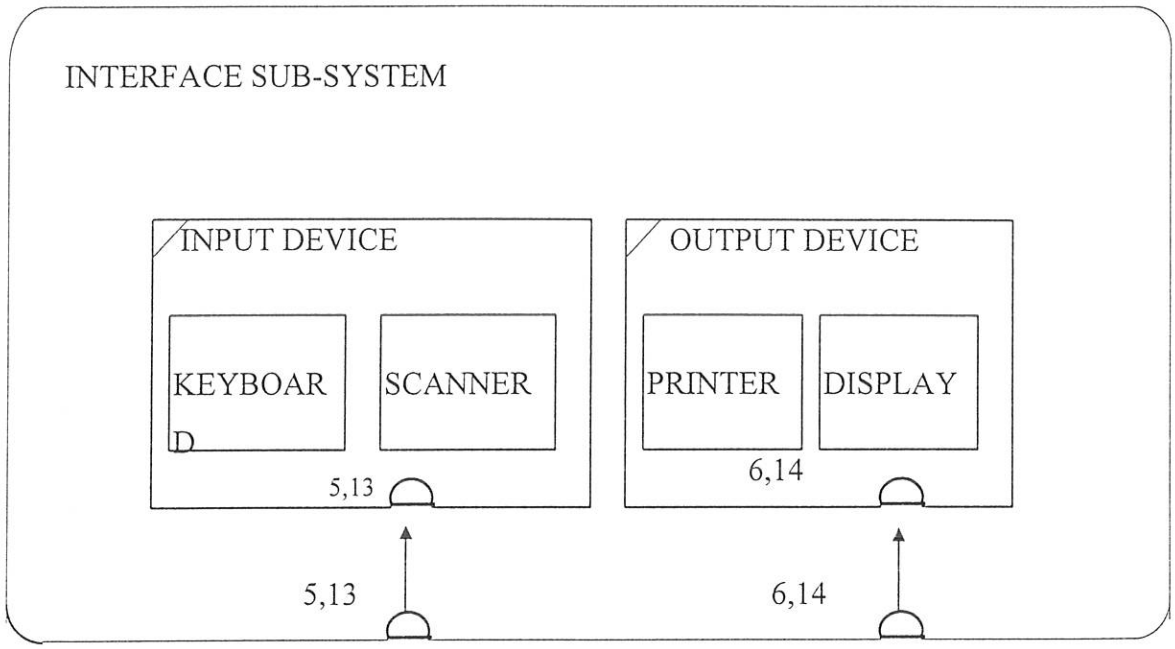


Fig. 4.5. **Interface Sub-System**

4.4.2. SUB-SYSTEM

DESCRRIPTION SUB-SYSTEM

Description: Coordinate the activities relating to the maintenance of the description of the Manuscript and Archival collection.

CONTRACT	RESPONSIBILE CLASS
[1] Maintain description of Manuscripts	Manuscripts
[2] Maintain description of Archives	Archives
[3] Maintain description of Clandestine Litrature	Clandestine Litrature
[4] Process Transaction	Transaction

COLLECTION MANAGEMENT SUB-

Description: Coordinate the activities relating to the handling of information on in-house activities like accession and movement of materials.

CONTRACT	RESPONSIBILE CLASS
[10] Maintain Accession Record	Accession
[11] Maintain Movement Record	Movement
[12] Process Transaction	Transaction

INTERFACE SUB-SYSTEM

Description: Coordinates the devices used by the workstation to transfer information to and from the users of the Manuscript and Documentation Center.

CONTRACT	RESPONSIBILE CLASS
[5] Get user input	InputDevice
[6] Put output to the user	OutputDevice

4.4.2. CONTRACTS

CONTRACT 1

MAINTAIN DESCRIPTION OF MANUSCRIPTS

Description:-Provide basic description maintenance functins such as, create, update, delete and inquiry.

Server:- Manuscript

Client:- Transaction, Create, Delete, Update, Inquery

CONTRACT 2

MAINTAIN DESCRIPTION OF ARCHIVES

Description:-Provide basic description maintenance functins such as, create, update, delete and inquiry.

Server:- Archives

Client:- Transaction, Create, Delete, Update, Inquery

CONTRACT 3

MAINTAIN DESCRIPTION OF CLANDESTINE LITRATURE

Description:-Provide basic description maintenance functins such as, create, update, delete and inquiry.

Server:- Clandestine Litrature

Client:- Transact

CONTRACT 4

PROCESS TRANSACTION

Description:- Process the description maintenance and report generation services available at the IESMDC_WS including create, update, delete, inquery, and report generation.

Server:- Transaction
Client:- IESMDC_WS

CONTRACT 5

GET USER INPUT

Description:- Handle inputs from the user which include keyboard and scanner.

Server:- Input Device
Client:- IESMDC_WS

CONTRACT 6

PUT OUTPUT TO THE USER

Description:- Handle outputs to the user, including detailed information on materials, display message, guides to collection.

Server:-Output Device.
Client:- Transaction.

CONTRACT 7

VERIFY PASSWORD

Description:- Make sure that this user has a valid access password.

Server:- User
Client:- IESMDC

CONTRACT 8

VERIFY USER

Description:- Make sure that this user is yours.

Server:- IESMDC
Clients:- Input Device

CONTRACT 9

LIST MATERIALS' DETAIL

Description:- Retrive all the details of the collection at IESMDC.

Server:- IESMDC
Client:- Report

CONTRACT 10

MAINTAIN ACCESSION RECORD

Description:- Provide basic accession record maintenance functions.

Server:- Accession

Clients:- Transaction, Create, Delete, Update, Report.

CONTRACT 11

MAINTAIN MOVEMENT RECORD

Description:- Provide basic movement record maintenance function, such as Create, Delete, Update and Report.

Server:- Movement
Client:- Transaction, Create, Delete, Update, Report.

CONTRACT 12

PROCESS TRANSACTION

Description:- Process the collection management record maintenance and report genetation services available at the IESMDC_WS including, create, delete, update and report generation.

Server:- Transaction
Client:- IESMDC_WS

CONTRACT 13

GET USER INPUT

Description:- Handle inputs from users including keyboard and scanner.

Server:- InputDevice
Client:- IESMDC_WS

CONTRACT 14

PUT OUTPUT TO THE USER

Description:-Handle outputs to the user including, lists of materials accessioned, moved for different purpose, and display messages.

Server:- OutputDevice
Clients:- Transaction

4.4.4. INHERITANCE HIERARCHIES OF CLASSES

Fig. 4.6. Inheritance Hierarchies of Classes of Description Sub-System

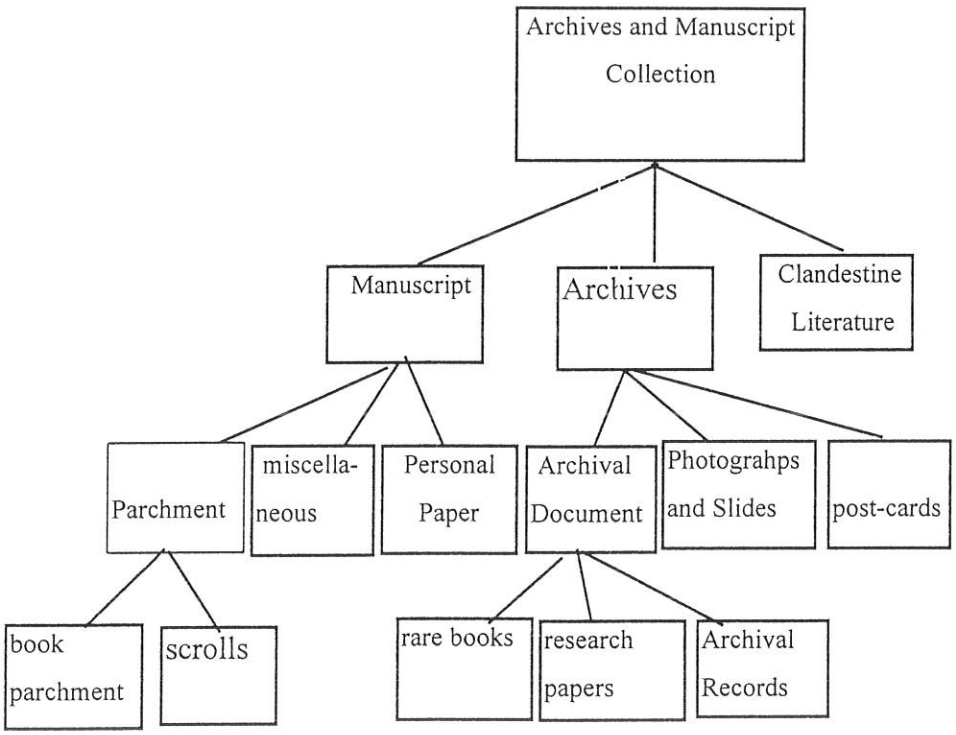


Fig. 4.7. Inheritance Hierarchies of Movement Class

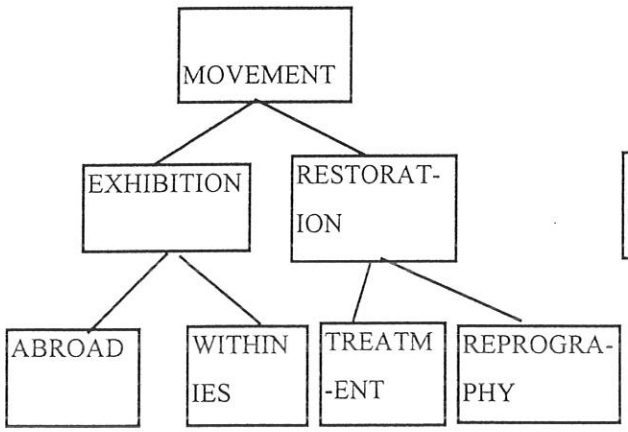
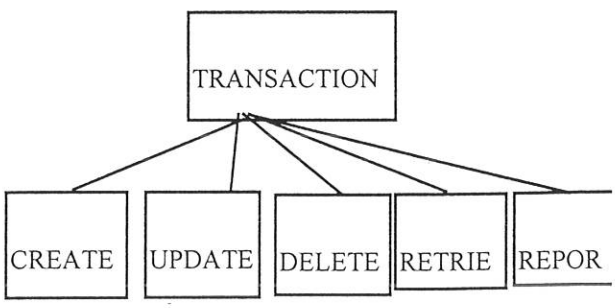


Fig. 4.8. Inheritance hierarchies of Transaction Class



4.4.5. CARDINALITY RELATIONSHIP OF CLASSES

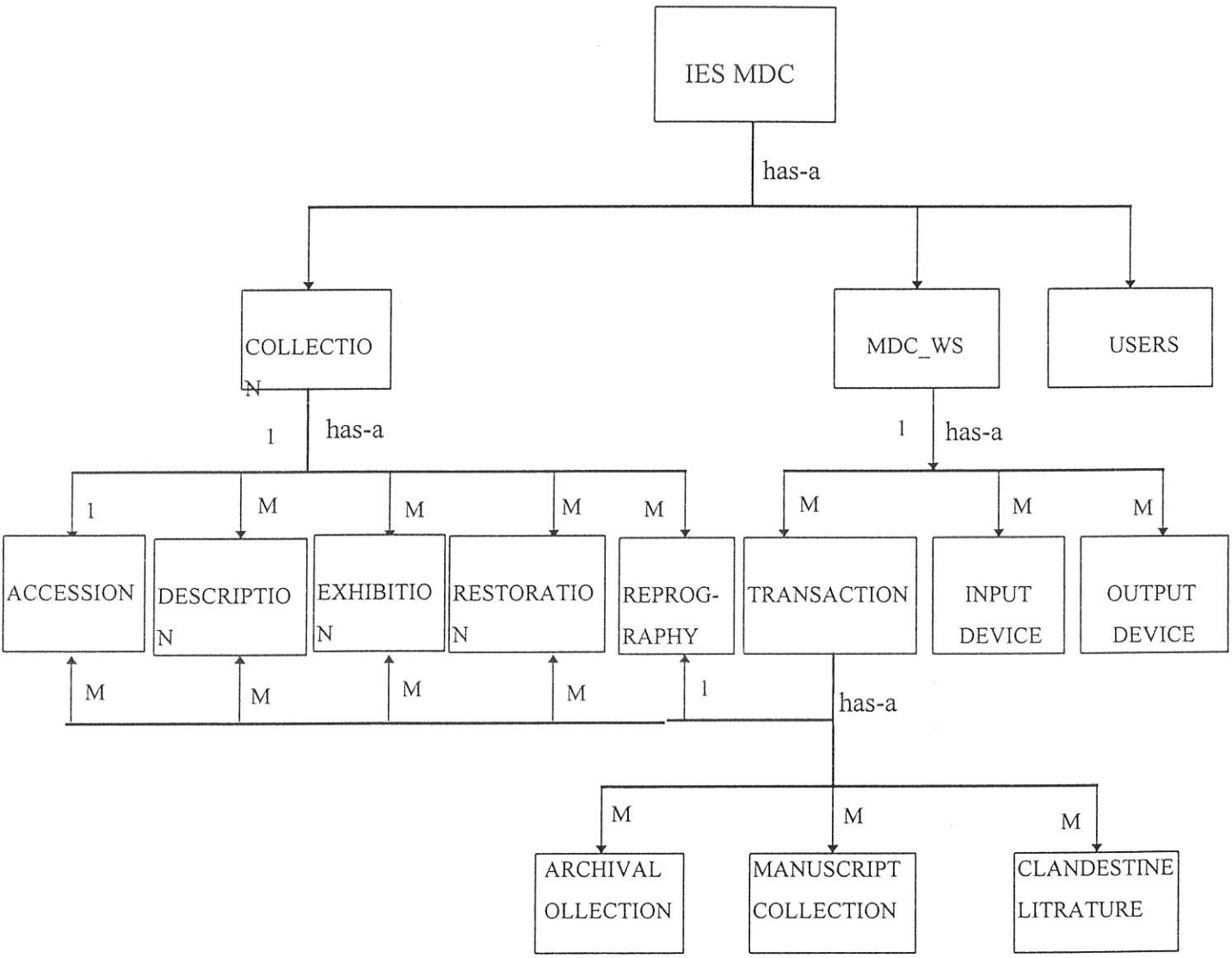


Fig. 4.9. Cardinality Relationship Diagram

4.4.6. CLASS DEFINITIONS

PARCHMENT CLASS

Description - The Parchment class is an abstract class that provides common services for all types of parchment materials.

Super classes - PersistantObject
Subclasses - Parchment Book, Scrolls

CONTRACTS

1. [1] Maintain Description of the Collection is implemented by the following Public Method which are listed under the RESPONSIBILITY below.

RESPONSIBILITY	DESCRIPTION
AccessionNo.	Return my current identification No.
Title	Return my title
DateOfAccession	Return my date of accession
Size	Return my size
NoOfColumns	Return my number of columns
NoOfLines	Return my number of lines
Language	Return my language
Date	Return my date in which I am created
Content	Return my description of the subject
Illumination	Return my description of Illumination which I consist
Illustration	Return my description of the Illustration which I consist
Status	Return my description of physical status
Source	Return my Source/Donor
EMML Pr. No.	Return my EMML Pr. No.
EMMLVolNo	Return my volume No given by EMML
EMMLPageNo	Return my page No given by EMML
Accession	Return my accession detail
Exhibition	Return my exhibition detail
Restoration	Return my restoration detail
Reprography	Return my reprographic detail
accession.: anAccessionNo	Set my IDNo to an AccessionNo
Title: aTitle	Set my title to aTitle
DateOfAccession : aDateOfAccession	Set my Accession Date to aDateOfAccession
Size : aSize	Set my size to aSize
NoOfColumns : aNoOfColumns	Set my No of columns to aNoOfColumns

NoOfLines : aNoOfLines	Set my number of lines to aNoOfLines
Language : aLanguage	Set my language to aLanguage
DateCreated : aDateCreated	Set my date of Creation to aDateCreated
Content : aContent	Set my description of a Subject to aContent
Illustration : anIllustration	Set my description of Illustration to anIllustration
Illumination : anIlumination	Set my description of Illumination to anIllumination
Status : aStatus	Set my description of the physical status to aStatus
Source : aSource	Set my source to aSource
EMML Pr. No. : anEMMLPrNo	Set my EMML Pr. No. to anEMMLPrNo.
EMMLVolNo : anEMMLVolNo	Set my volume No given by EMML to anEMMLVolNo
EMMLPageNo : anEMMLPageNo	Set my page No given by EMML to anEMMLPageNo

DATA	DESCRIPTION
AccessionNo.	my current identification No.
Title	my title
DateOfAccession	my date of accession
Size	my size
NoOfColumns	my number of columns
NoOfLines	my number of lines
Language	my languge
Date	my date in which I am created
Content	my description of the subject
Illustration	my description of the Illustration which I consist
Illusmination	my description of Illumination which I consist
Status	my description of the physical status
Source	my Source/Donor
EMML Pr. No.	my EMML Pr. No.
EMMLVolNo	my volume No given by EMML
EMMLPageNo	my page No given by EMML

PARCHMENT BOOK CLASS

Description: The Parchment Book Class is a data repository that maintains information about parchment books. The more generalized functions are inherited from the Parchment Class.

Superclasses: Parchment Class

subclasses: None

CONTRACT

[1] Maintain Description of the collection is implemented by the following Public Method .

RESPONSIBILITY	DESCRIPTION
Pagination	Return my Pagination
TableOfContent	Return my Table of Content
Miniature	Return my description of miniature I consist
Varia	Return my description of Varia
Scribers	Return the description about the Scribers
Pagination : aPagination	Set my Pagination to aPagination
TableOfContent : aTableOfContent	Set my TableOfContent to aTableOfContent
Miniature: aMiniature	Set my description of Miniature I consist to aMiniature
Varia : aVaria	Set my description of Varia to aVaria
Scribers : aScriber	Set my description of Scribers to aScriber

DATA	DESCRIPTION
Pagination	my Pagination
TableOfContent	my Table of Content
Miniature	my description of miniature I consist
Varia	my description of Varia
Scribers	my description about Scribers

SCROLLS CLASS

Description: The Scrolls Class is a data repository that maintains information about scrolls (roll parchments which consist magical prayer). The more generalized functions are inherited from the parchment class.

Superclasses: ParchmentClass

Sub-classe: None

CONTRACTS

[1] Maintain Description of the collection is implemented by the following public method.

RESPONSIBILITY	DESCRIPTION
TypeOfPrayers	Return my type of prayer I contain
TypeOfPrayers: aTypeOfPrayer	Set the type of prayer I contain to aTypeOfPrayer
DATA	DESCRIPTION
ThypeOfPrayer	my type of prayer

ARCHIVAL RECORDS CLASS

Description: Archival Records class is a data repository maintaining information on archival records.
Superclass: Archival Documents
Subclass: None

CONTRACTS

[1] Maintain Description of the collection is implemented by the following public methods.

RESPONSIBILITY	DESCRIPTION
AccessionNo	Return my accessionNo
Title	Return my title
RecordCreatingEntity	Return the name of the entity whon created me
InclusiveDate	Return my date of coverage
Quantity	Return my quantity
Content	Return my content
AccessionNo: anAccessionNo	Set my AccessionNo to anAccessionNo
Title:aTitle	Set my title to aTitle
RecordCreatingEntity: aRecCreatingEntity	Set my RecordCreatingEntity to aRecCreatingEntity
InclusiveDate: anInclusiveDate	Set my InclusiveDate to anInclusiveDate
Quantity: aQuantity	Set my quantity to aQuantity
Content: aContent	Set my content to aContent
DATA	DESCRIPTION
AccessionNo	my accessionNo
Title	my title
RecordCreatingEntity	the name of the entity who created me
InclusiveDate	my date of coverage
Quantity	my quantity
Content	my content

PERSONAL PAPERS CLASS

Description: The Personal Paper class is a data repository which maintains information about personal papers. The more generalized functions are inherited from Manuscript Class. There is one instance of this class for each personal paper collection.

Superclass: Manuscripts
Subclasses: None

CONTRACTS

[1] Maintain Description of the collection is implemented by the following data type.

RESPONSIBILITY	DESCRIPTION
FolderNo	Return my folder number
AccessionNo	Return my ID No. by which I am registered
Content	Return my description of the subject
NumberOfPages	Return my number of pages
PhysicalType	Return my physical type
Remark	Return my additional description
FolderNo : aFolderNo	Set my folder number to aFolderNo
AccessionNo: anAccessionNo	Set my accession number to anAccession
Content: aContent	Set my description of the content to aContent
NumberOfPages: aNoOfPages	Set my number of pages to aNoOfPages
PhysicalType: aPhysicalDesc.	Set my physical type to aPhysicalDesc.
Remark: aRemark	Set my additional description to aRemark
DATA	DESCRIPTION
FolderNo	my folder number
AccessionNo	my ID No. by which I am registered
Content	my description of the subject
NumberOfPages	my number of pages
PhysicalType	my physical type
Remark	my additional description

ARCHIVAL DOCUMENTS
CLASS

Description: An Archival Document Class is an abstract class that provides common services for all archival documents.

Superclass: Archives
Subclass: Rare Book, and Research

CONTRACTS

[1] Maintain Description of the collction is im,plemented by the follosing public method : which are listed under the RESPONSIBILITY below.

RESPONSIBILITY	DESCRIPTION
AccessionNo	Return my current identification number
Title	Return my title
Author	Return my author name
Size	Return my size
NoOfPages	Return my number of pages
NoOfColumns	Return my number of columns
NoOfLines	Return my number of lines
Date	Retirm my date
AccessionNo: anAccessionNo	Set my current identification number to anAccession
Title: aTitle	Set my title to a Title
Author: anAuthor	Set my author name to anAuthor
Size: aSize	Set my size to aSize
NoOfPages: aNoOfPages	Set my number of pages to aNoOfPages
NoOfColumns: aNoOfPages	Set my number of columns to aNoOfColumns
NoOfLines:aNoOfLines	Set my number of lines to aNoOfLines
Date: aDate	Set my date to aDate
DATA	DESCRIPTION
AccessionNo	my current identification number
Title	my title
Author	my author name
Size	my size
NoOfPages	my number of pages
NoOfColumns	my number of columns
NoOfLines	my number of lines
Date	my date

RARE BOOK CLASS

Description: The Rare Book class is a data repository which maintains information about rare books. The more generalized functions are inherited from Manuscript Class. There is one instance of this class for each personal paper collection.

Superclass - Archival Document
Subclass - None

CONTRACT

[ ] Maintain Description of the collection is implemented by the following public methods:

RESPONSIBLE	DESCSCRIPTION
Source/Donor	Return the source from which I am found
EMMLPrNo	Return my EMMLPrNo.
EMMLVolNo	Return my volume number assigned by EMML
EMMLPageNo	Return my page number assigned by EMML

CallNo	Return my page number
Source/Donor: aSource	Set the source from which I am found to aSource
EMMLPrNo: anEMMLPrNo	Set my EMMLPrNo to anEMMLPrNo
EMMLVolNo: anEMMLVolNo	Set my volume number assigned by EMML to anEMMLVolNo
EMMLPageNo: anEMMLPageNo	Set my page number assigned by EMML to anEMMLVolNo
CallNo: aCallNo	Set my call number to aCallNo
DATA	DESCRIPTION
Source/Donor	Return the source from which I am found
EMMLPrNo	Return my EMMLPrNo.
EMMLVolNo	Return my volume number assigned by EMML
EMMLPageNo	Return my page number assigned by EMML
CallNo	Return my page number

RESEARCH PAPER CLASS

Description: The Research Paper is a data repository which maintains information about research papers. The more generalized functions are inherited from Manuscript Class. There is one instance of this class for each personal paper collection.

Superclass - ArchivalDocument
Subclass - None

CONTRACTS

[1] Maintain Description of the collection is implemented by the following public methods:

RESPONSIBILITY	DESCRIPTION
TypeOfResearch	Return my type of research
TypeOfReasearh: aTypeOfResearch	Set my type of research to aTypeOfResearch
DATA	DESCRIPTION
TypeOfResearch	my type of research

IMAGE CLASS

Description: An Image Class is an abstract class that provides common services for all types of Image Archives.

Superclass: Archives
Subclasses: Photograph and Slides, Post-Card

CONTRACT

[1] Maintain Description of the collection is implemented by the following public method which are listed under the RESPONSIBILITY below.

RESPONSIBILITY	DESCRIPTION
Name	Return my name
DateOfCreation	Return my date of creation
Content	Return my description of the content
History	Return my historical descriptioon
Color	Return my color
Name: aName	Set my name to aName
DateOfCreation: aDateOfCreation	Set my date of creation to aDateOfCreation
Content: aContent	Set my description of the content to aContent
History: aHistory	Set my historical descriptioon aHistory
Color:aColor	Set my color to aColor

DATA	DESCRIPTION
Name	my name
DateOfCreation	my date of creation
Content	my description of the content
History	my historical descriptioon
Color	my color

PHOTOGRAPH AND SLIDE

Description: Photograph and Slides Class is a data repository which maintains information about photographs and slides. The more generalized functions are inherited from Manuscript Class. There is one instance of this class for each personal paper collection.

Superclass: ImageClass
Subclass: None

CONTRACT

[1] Maintain description of the collection is implemented by the following public methodwhich are listed under the RESPONSIBILITY below.

RESPONSIBILITY	DESCRIPTION
Location	Return my current location
Form	Return my physical form
Location:aLocation	Set my current location to aLocation
Form: aForm	Set my physical form to aForm

DATA	DESCRIPTION
Location	my current location
Form	my physical form

ACCESSION CLASS

Description: The accession class is a data repository, maintaining accession information of the IES museum. There is one instance of this class for each accession. Many objects accessioned in a lot have one common accession data.

Superclasses- Collection Management
subclasses: None.

CONTRACT

[10] Maintain Accession Record is implemented by this class.

DATA	DESCRIPTION
EntryNo	The accession number
AccessionDate	My accession date.
Source	The name of the donor or vendor
MethodofAcquisition	The method of acquisition (donation,etc.)
SourceofFunds	The source of the fund for purchased objects
legaldocument	The receipt of purchase or acnoledgement letter
Quantity	

ADD CLASS

Description: The Create class services the data entry. This transaction is created by the transaction class. This transaction is a transient object.

Superclasses- Transaction
Subclasses - None

CONTRACT

[4] Process Transaction is implemented by the following public methods.

a)CreareMaterial
b)WriteMaterial

RESPONSIBILITY	DESCRIPTION
CreateMaterial: anaccessionNo	Create the with an accessionNo
WriteMaterial: anaccessionNo	Write its detail for this object

DELETE CLASS

Description: The Delete class services the deleting of the collection's record. This transaction is created by the transaction class. This transaction is a transient object.

Superclasses - Transaction.
Subclasses - None.

CONTRACT

[4] Process Transaction is implemented by the following public methods.

A) DeleteMaterial:

RESPONSIBILITY	DESCRIPTION
ConfermDelete:	Ask the user for confirmation to delete.
DeleteMaterial:anAccessionNo	Delete the material with identification: anAccessionNo

INQUIRY CLASS

Description: The Inquiry class services the retrieval of the information on the material. This transaction is created by the transaction class. This transaction is a transient object, ceasing to exist after the request is serviced.

Superclasses - Transaction
Subclass - None

CONTRACT

[4] Process Transaction is implemented by the following public methods:
a)MaterialDetail

RESPONSIBILITY	DESCRIPTION
MaterialDetail: anaccessionNo	Tell the user the details of the material

REPORT CLASS

Description: The Report class services the the rtieval of the the information on the the material using a certain characteristics. This transaction is created by the transaction class. This transaction is a transient object.

Superclasses - Transaction.
Subclasses - None

CONTRACT

[4,12] Process Transaction is implemented by the following public methods:
a) MaterialsDetail:

RESPONSIBILITY	DESCRIPTION
MaterialDetail: aMaterialDetail	List for the user all materials by their title/name

TRANSACTION CLASS

Description: The Transaction class is an abstract class that provides common services ofr all transactions.
Superclasses- Collection
Subclasses - Create, Update, Delete, Inquiry, MoveObject, Report.

CONTRACTS

[4,12] Process Transaction is a subclass responsibility.

RESPONSIBILITY	DESCRIPTION
VerifyExistance	Verify the existance of the information on the material
DATA	DESCRIPTION
accessionNumber:	The accession number associated with the transaction.

UPDATE CLASS

Description: The Update class services the editing of the information on the material. This transaction is created by the transaction class. This transaction is a transient object.

Superclasses - Transaction.
Subclasses - None.

CONTRACTS

[4,12] Process Transaction is implemented by the fiollowing public methods:
a) ChangeMaterialDetail:

RESPONSIBILITY	DESCRIPTION
ConfirmChange:	Ask the user for confirmation to update.
CangeMaterialDetail:anAccessionNo	Change the details for the material with identification:anAccessionNo

USER CLASS

Description - The User class is a data repository, maintaining information on users of the Center. There is one instance of this class for each user of the system.

Superclasses- PersistentObject.
Subclasses - None

CONTRACTS

[7] Verify User is implemented by the following public methods:
a) ValidatePassword:

RESPONSIBILITY	DESCRIPTION
ValidPassword:aPassword	Return true if a Password equals my password, false otherwise.
DATA	DESCRIPTION
userId	My identification number.
password	My password.

IESMDC_WS CLASS

Description: The IESMDC_WS class is responsible for providing general services for users, creating the appropriate Transactions. There is one instance of this class for each workstation.
Superclasses- Collection
Subclasses - None
Contract - None

RESPONSIBILITY	DESCRIPTION
aCreateTransaction:	Initiate the appropriate transaction
anAccessionNumber:	Take the accession number the user wants to take action.
anMaterialInformation:	Get the material's information the user wants to update or create a new one.
aMaterialTitle:	Get the material title to list all materials with the same title
Iterate:	Allow user to request another action.

IESMDC CLASS

Description: The IESMDC class handles requests about objects and users. There is only one instance of this class.

Superclasses- PersistantObject.
Subclass- None

CONTRACTS

[8] Verify User is implemented by the following public methods:
a. ValidateUser

[9] List materials' details is implemented by the following public methods:
a. ListMaterialDetail

RESPONSIBILITY	DESCRIPTION
ValidateUser: anInteger	Compare aninteger to my users. Return true if it is a valid user, false otherwise
ValidatePassword: aPassword forUser: aUseer	Compare aPassword to the aUser's password. Return true if it is equal, false otherwise.
List MaterialDetail: aMaterialTitle	Compare a MaterialTitle to the collecions' title. For matching instances, return their details.
DATA	DESCRIPTION
Collection	list of the IES MDC collection
Users	list of valid users of the system
IESMDC Workstation	list of available workstations

CHAPTER FIVE

IMPLEMENTATION OF THE PROPOSED DATABASE SOLUTION

5.1. THE PROTOTYPE DEVELOPED

Prototyping is used to test whether the newly developed database system can easily be implemented or not. As suggested by many workers (Kendall, 1995, for instance), before prototyping one has to have a knowledge of the entire systems development life cycle. In our case, this has been done in the previous chapters where the existing information handling system at IES Manuscript and Documentation Center was analysed, requirements (together with major problems) identified through user survey, and an alternative database solution is proposed.

In this work, a selected feature prototyping was followed for the purpose of implementing the database designed in the previous chapter. "Selected feature prototyping refers to building an operational model that includes some, but not all, of the features that the final system will have." [Kendall, 1995]. In particular, the Parchment class is selected to see whether system developed on the basis of object oriented technology can be implemented effectively and to see the reaction of users about the newly proposed database system. This class has two sub-classes (Book Parchment and Scroll). The abstract class called Parchment consists fifteen (15) common data elements and operations with Book Parchment class and Scroll class. This class does not create an object since it is an abstract class. Thus, the two sub-classes inherit

the common information and basic operations from the super class and define their unique data elements in their own class.

dBASE for Windows (dBASE V) was used to develop the prototype. The class declarations have been generated using the Form Designer. The 15 common data elements with their entry fields and click buttons which perform common operations to both sub-classes specified above are contained in a super class form called PARCHFORM.WFM. This super class form contains also common properties of the other forms, such as FontName, Color, etc.

```
CLASS PARHFORM OF FORM
Set Procedure TO BUTTONS.CC additive
this.Left =        1
this.ColorNormal = "  / "
this.Top =  """
this.Text = """
this.HelpId = """
this.HelpFile = """
this.Width=        103
this.Heigt=          20.5   .....


.........

ENDCLASS
```

Sub-classes not based on forms (Book Parchment and Scroll classes) were created by writing a class declaration using CLASS...ENDCLASS. They are derived from the super class form called PARCHFORM.

CLASS PARHFORM OF PARCHFORM

.....

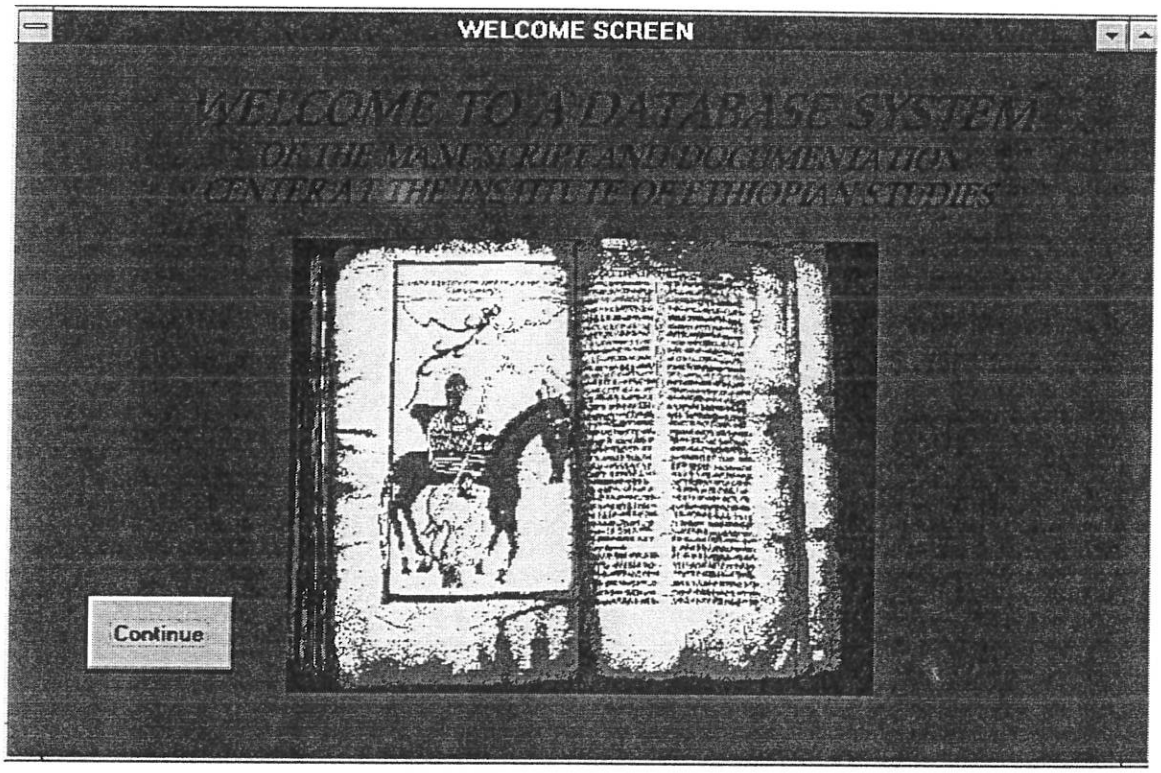
ENDCLASS

In addition to the super class and two sub-classes specified above, other classes which hold information related to accession and exhibition for a particular collection have also been implemented. The forms consisting these two classes are accessed by click buttons defined in a super class form.

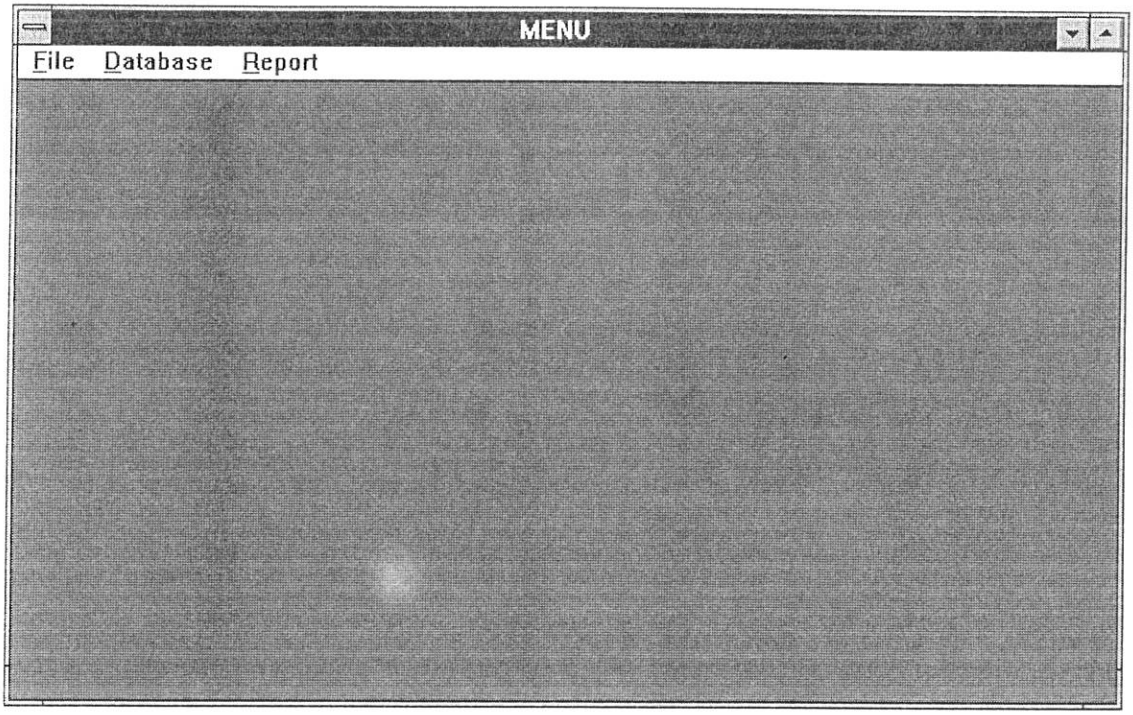
With regard to the storage of data, dBASE V fails to store data within the object together with operations. Since it is a relational database by design, all data are stored in tables separated from the object. Thus, in order to store data different tables have been created. They include, Parchmet.dbf, Scroll.dbf, ParBook.dbf, Access.dbf, and Exhibit.dbf. But, in order to inherit data elements from the super class the three tables, Parchmet.dbf, Scroll.dbf and ParBook.dbf have been linked together by creating a query called Parchmet.qbe. This query is linked to the two concrete class forms called Parbook.wfm and Scrol.wfm. This enabled the query to supply common data elements to the concrete class forms.

The following presentation will highlight to understand how some of the main features of the prototype developed.

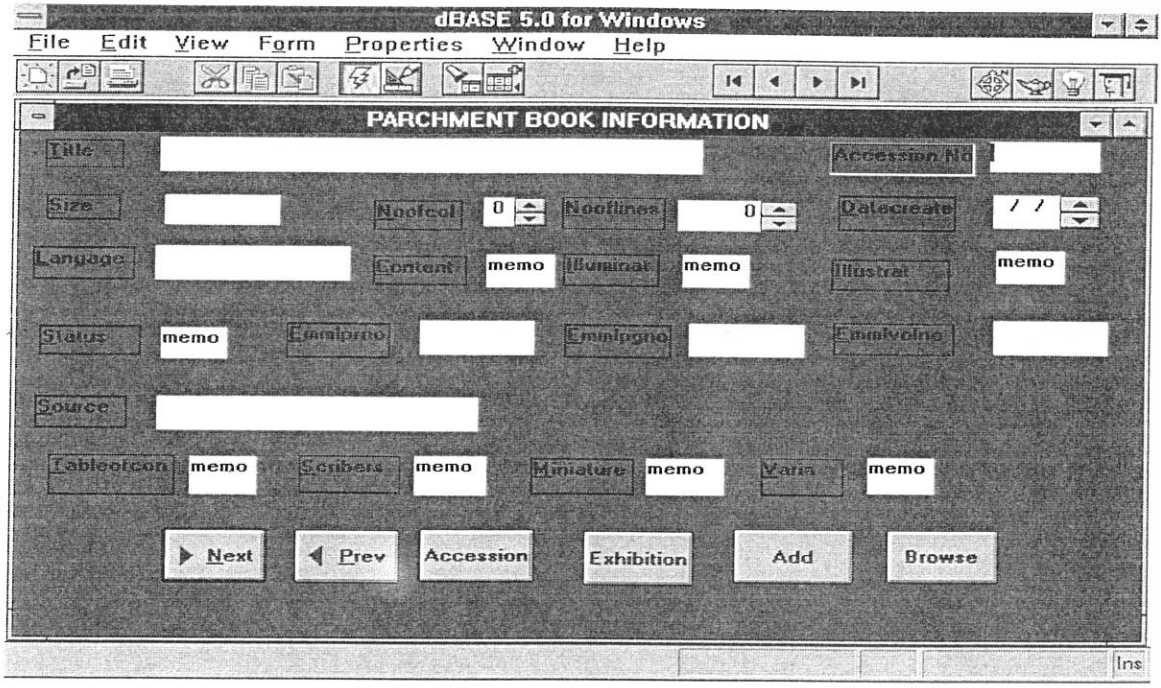
When the start icon is clicked twice from the Navigator window, the Welcome Screen which consists a pictorial representation of the parchment collection of the Manuscript and Documentation Center at IES, appears. The screen also consists click buttons which enable the user to continue operation or exit.



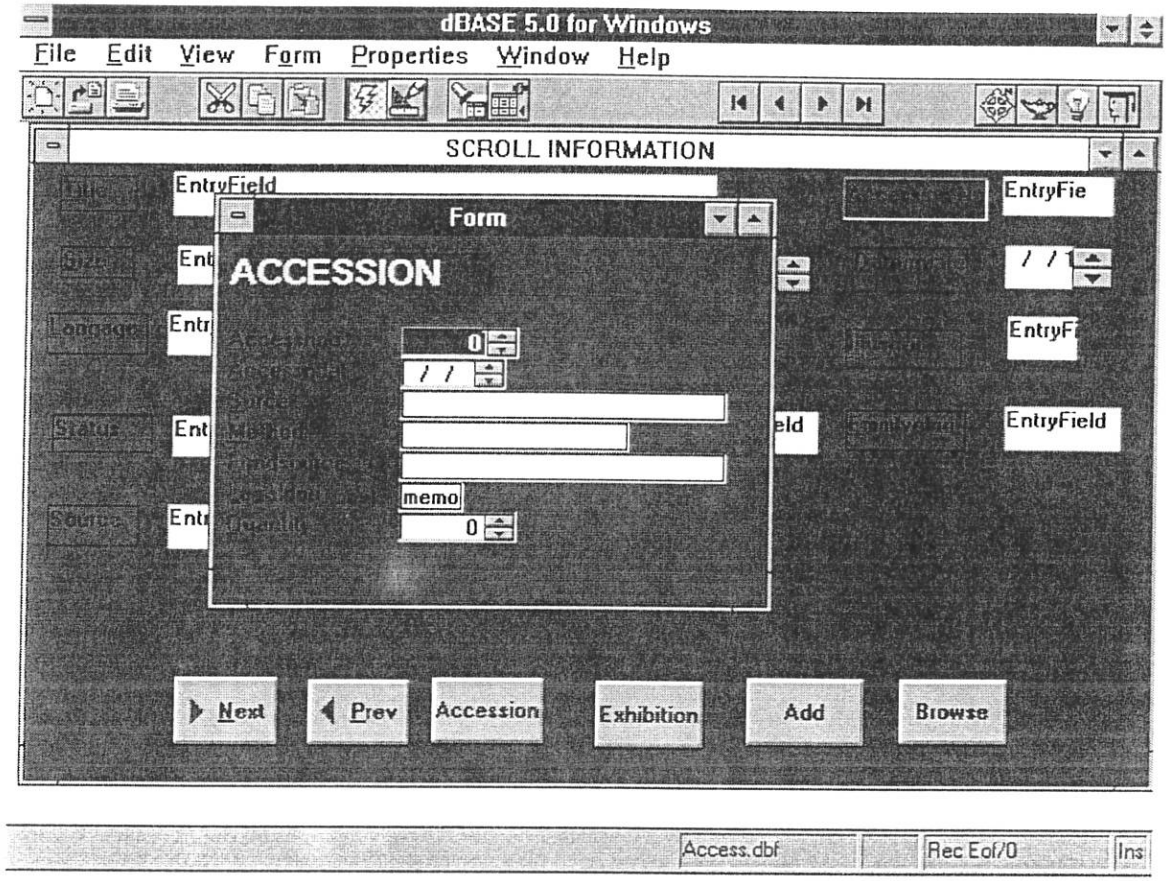
When the user presses Continue button, a form shown below, consisting of Menu will appear.

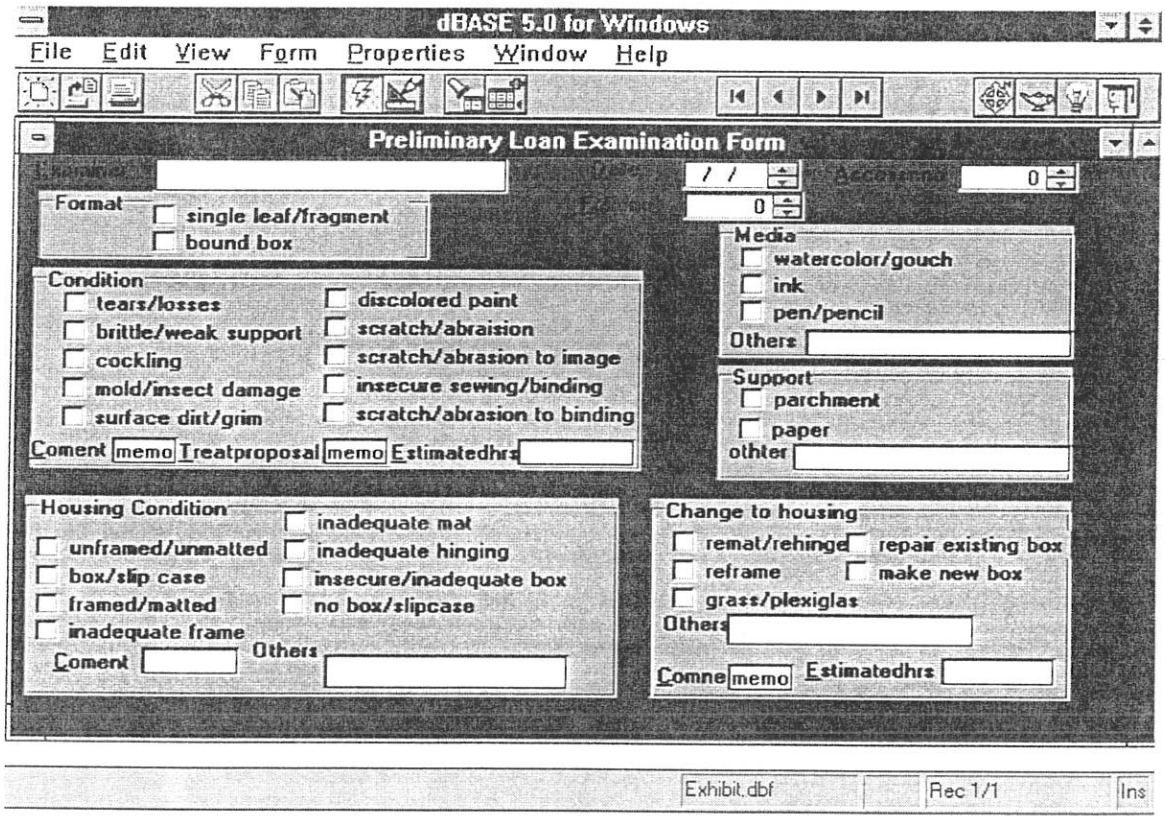


The Menu bar consists File, Database, and Report. When the user clicks on File a pull-down menu appears consisting Exit which helps to quit from the database operation. When the user clicks on Database a super class name called Parchment appears, when clicked generating cascading menu consisting two sub-class names - Book Parchment and Scroll. When each of them are clicked respective data entry forms appear. Both data entry forms (Parchment Book Information and Scroll Information) inherit fifteen (15) common attributes and basic operations from a base form called Parchform.wfm and append their own unique attributes. The user can add information in to the form by clicking on "Add" ballon.



In addition to the data entry form, there are forms used to enter accession and exhibition related information for a particular item. The buttons for each of them are available on each data entry forms.


dBASE 5.0 for Windows
File Edit View Form Properties Window Help
SCROLL INFORMATION
EntryField
Form
ACCESSION
memo
Next
Prev
Accession
Exhibition
Add
Browse
Access.dbf
Rec Eof/0
Ins


dBASE 5.0 for Windows
File Edit View Form Properties Window Help
Preliminary Loan Examination Form
Format
single leaf/fragment
bound box
Condition
tears/losses
brittle/weak support
cockling
mold/insect damage
surface dirt/grim
discolored paint
scratch/abraision
scratch/abrasion to image
insecure sewing/binding
scratch/abrasion to binding
Coment memo Treatproposal memo Estimatedhrs
Media
watercolor/gouch
ink
pen/pencil
Others
Support
parchment
paper
othter
Housing Condition
unframed/unmatted
box/slip case
framed/matted
inadequate frame
inadequate mat
inadequate hinging
insecure/inadequate box
no box/slipcase
Coment
Others
Change to housing
remat/rehinge
reframe
grass/plexiglas
repair existing box
make new box
Others
Comne memo Estimatedhrs
Exhibit.dbf
Rec 1/1
Ins

The user can also browse by clicking a browse button on each of the data entry forms. Basic operations like adding records, deleting and editing can be performed by using dBASE standard menu.

5.2. USERS' COMMENT ON THE PROTOTYPE DATABASE

The prototype was demonstrated to the staff and the following comments were made by made by them. The major comment focused on the data entry form, in particular with regard to the form layout and its properties which are listed as follows.

It was suggested that the form be renamed as "Manuscript Information" rather than "Book Parchment Information" to include all types of collections. As it was explained by the staff, most of the data entry fields are similar for most of the collection types.

There is a need to add fields like Material and Folio Number in the data entry form since they represent the most important information in identifying knowing the type of the material and the material itself.

Some fields need to be excluded from the database since they are duplications. For instance, a field called Scriber can be excluded since the details on it can be included in the Varia. Varia means various information which holds different information other than the basic catalogue information. Other fields like Table of Content and Miniature need also be excluded from the

database since the former can be described in the Content field and the latter in the Illustration field.

There was also a suggestion to change the name of fields. It is suggested to substitute DateOfCreation with DateOf Writing, Size with Measurement and AccessionDate with AquisitionDate.

Also, the date is expressed in terms of Century, the entry field should be changed from the spin box to a rectangle.

In regard to arrangement of fields, it was suggested to align all the important fields along the left part of the data entry form. These fields include Title, Material, Date, Language, Content, Illumination, Illustration and Varia. Those to be aligned to the right include Accession No., Folio No., NumberOf Lines, NoOf Pages, etc.

In regard to organizing fields, all which constitute detailed information need to be organized under the heading "Description". These fields include Content, Illumination, Illustration, and Varia. Others like information related to Ethiopian Manuscript Microfilm Library (EMML) and other related institutions be organized under the heading "Reference".

From the data entry form related to accession, it was suggested that a field called legal document be excluded and substituted by a field which says "Content" to hold general description on the content of the newly acquired material. In exhibition related data entry form, there are two fields which were not clear to the staff. These are Format and Media.

In spite of all comments made which are stated above, they also expressed their appreciation about the user friendliness of the menu and the integration of data entry forms for material detail, accession and exhibition related data entry forms. They also appreciated the provisions made along the lines of generating a report on newly accessioned materials, the possibility made for searching by various fields, and the possibility of incorporating detailed description in the note field.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1. CONCLUSION

Archival institutions are information systems consisting archival materials, like official files of institutions and organizations, publications issued by such institution , and personal papers of individuals. Their purpose is providing these materials for historical and academic research, promotion of historical and national consciousness and identity, etc. IES Manuscript and Documentation Center is classified under a category of archival institutions called Historical Manuscript Repositories. Such institutions are aimed at maintaining archives comprising records other than their own and not necessarily related to their own functions and activities. These types of archival institutions are common in Universities. Collecting and processing non-published materials on Ethiopia and providing services to users are the major objectives of the Manuscript and Documentation Center at IES. The collection types that are held by the Center include parchment or literature on leather or skin, scrolls that are roll parchments consisting magical prayers, photographic archives, slides, post-cards, reels of microfilms/fiches etc. They are in different local and foreign languages. Acquiring materials through purchase or donation, accessioning or registering, arranging, and preparing finding aids (describing) are the major functions of the Center. The Center also renders services like, reference services, copy services, information service, and exhibiting holdings.

A lot of problems were identified during the study period through interviews, questionnaires, reviewing related documents and personal observation. The following is a summary of the findings.

- There is poor arrangement of archival and manuscript collection since the Center does not follow any standard principles of arrangement. This has an impact on the description made for the collection and on locating the materials properly.

- Most of the finding aids of the Center (e.g. inventory book, guides to microfilms and guides to photograph) constitute general information which do not allow multiple access and lack enough information. Especially the inventory book which is the major finding aid at the Center, is not classified by collection type and not indexed by any key term.

- Finding aids like card catalogue, indexes, photographic list, etc. provide detailed information, but they constitute a very small proportion of the collection since preparing such description takes longer time. This is because of the fact that describing each collection in detail requires different specialists who specialize in the area of archives and manuscripts and who have different language skills. It may also involve a paleographic study for proper description of some types of collection.

- The card catalogue which constitutes detailed description is hand-written which may not be legible to users.

- The reference service is the dominant service being rendered to users. Other services like copying, exhibiting and information services are not common as such.

- There is only one PC at the Center that is mainly used for office administration purpose duties and not yet been utilized in the handling of information for the collection. Microfilm/fiche readers and printers at the Center are old and limited in number.

- There is a chronic shortage of trained staff. The Center has only one professional staff who is an archivist and head of the Center and there is one staff for giving services to users of the Center in the search room.

- According to the survey conducted, it was found that most of the users come to the Center to conduct a research, and the reference service is the most preferred one. The type of collection that they mostly use is research material and manuscript. Although the card catalogue that consists detailed description of items represent a very small proportion of the collection, users prefer to consult card catalogue than any other finding aid. The reason may be due to the fact that it constitutes a detailed description. Users also prefer subject as the major access point although this is rarely available in the finding aids, available at the Center. Most users have also identified the preparation of subject lists as crucial when it comes to accessing archival and manuscript collection at the Center.

Nowadays, thanks to the current technologies as digital computers, micrographic systems, and scanners archival institutions are able to store high volume of data efficiently in electronic format and retrieve within fraction of time. It is also possible to develop databases for

structured fields of finding-aids (accession number, date, descriptions, originating entities, series title, quantity, etc.). Major benefits from such advancements include indexing, query searching, selective searching by field or key word, outputting the entire content of the database in printed form or microfiche. In addition to this, it is also possible to present information in different ways like chronologically, alphabetically, or by subject matter.

Thus, in order to exploit the advantages of the current technology and solve some or all of the problems of the Center, a database solution has been considered in this study. To this end, based on the requirements identified during the survey, a database was designed using object oriented techniques. The purpose of the database designed is to maintain a record related to finding aids, accession and movement of records. Report generation is also included in the design. A selected feature was taken and used for developing the prototype in order to implement the database designed. Users also commented on the prototype developed which is useful for making an improvement.

6.2. RECOMMENDATIONS

The major goal of the database system developed for the Center is to make primary and secondary historical documents and records directly and immediately accessible to students, researchers, expatriates and other groups of users of the Center. This is an academic attempt and as such it does not go beyond demonstration. And if the Center intends to consider the solution proposed further, the following are major steps to be undertaken in addition to what have been done in this study.

1. There is a need to fully develop the prototype database based on the comments of users and apply a full scale testing for further improvement of the database.

2. In such kind of rare and historical materials, the key is not only to provide a means to identify and locate archival and manuscript collection, but also to permit actual full-text delivery of needed information to users. This can be made, through converting important historical documents or collection into electronic format through scanning. For this, the following important points should be considered.

   - There is a need to select and prepare for scanning a core group of key historical archives and manuscripts, photographs etc. Usage statistics, their appeal to different user groups and the historical value can be used as criteria to select the material for scanning.
   - While using the scanning technology, the scan resolution needs to be tested for its capacity for the better representation of the original document of different sampled materials. Materials with varying age, varying paper size and weight, written with different writing instruments (stained, discolored, folded, or damaged) should be included in the sample. The purpose is to evaluate the modern electronic scanning and image processing technology in its efficiency for the unique collection of the Center.

   - Develop a database of indexes by using indexing and retrieval software which accept specific field and record structures established for the files. In relation to this, the efficiency of the OCR technology needs to be tested for scanning and interpreting a

unique sequence identification number to be used as an index for retrieval of these images.

3. The quality of the reference service can be raised by providing detailed description of the collection by the Center. In relation to this it is necessary to accomplish retrospective conversion of the card catalogue that already exists in the hand-written form. Original cataloguing of all manuscript and archival collection and incorporating it into the database need to be accelerated. This helps to provide a complete and up-to-date information and make accessible for any one searching the database to identify and locate the material.

4. The Center should follow multi-level arrangements like, group level, repository, series, file unit and document level so that descriptions can be made accordingly. This makes the arrangement to match with descriptions in finding-aids and facilitate locating archives and manuscripts.

5. A multimedia feature needs to be incorporated to the developed database in order to integrate the textual information with the pictorial content of manuscripts and in order to store still images (i.e., photographs, post-cards, slides, etc.) with their computerized data (indexes).

6. If the Center needs to consider the database solution detailed specifications on hard ware and Object Oriented Database Management Systems (OODBMS) are required.

7. It is necessary to find the possibility of integrating the database developed for IES Manuscript and Documentation Center with other previously developed databases for IES.

8. Attention should be paid for better storage, better training opportunities, and application of information technology to facilitate the provision of improved services to users.

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APENDIX 1

ADDIS ABABA UNIVERSITY
SCHOOL OF INFORMATION STUDIES FOR AFRICA

QUESTIONNAIRE FOR USERS OF IES MANUSCRIPT AND DOCUMENTATION CENTER

INTRODUCTION

Study is being conducted on the topic entitled "Designing and Development of an In-House Database System for Archival and Manuscript Records Management: The Case of Institute of Ethiopian Studies." This questionnaire is designed and distributed with the aim of identifying the gap between the information need of users and the information provision by the Manuscript and Documentation Center at the Institute of Ethiopian studies. Hence, please respond to all the items according to the instructions given in each part. Your frank and honest response to each item is of practical and valuable significance in the accomplishment of the study. Thank you in advance for your cooperation.

GENERAL DIRECTION

Please respond to the following question by marking (√) or supplying the required information in the space provided.

I. IDENTIFICATION

1. To which of the following categories do you belong?

[ ] AAU Academic staff [ ] AAU Administrative staff [ ] Post-Graduate student
[ ] Foreign scholar [ ] External user [ ] Under-Graduate student
[ ] Others, please specify_____

2. If you belong to AAU academic staff specify your:

Faculty_____ Department _____ Rank _____

3. If you belong to AAU administrative staff specify your:
Faculty_____ Department_____ Position_____

4. If you are a student specify your:
Faculty_____ Department_____ Year_____

II. FREQUENCY AND PURPOSE OF COMING TO THE MANUSCRIPT AND DOCUMENTATION CENTER

5. How often do you use the collection of the Manuscript and Documentation Center at IES?

[ ] Frequently (at least once a day) [ ] Sometimes (at least once a week)
[ ] Rarely (at least once a month) [ ] Occasionally (once in a while)

6. Rank the following reasons for your coming to the Manuscript and Documentation Center at IES in order of frequency. (give 1,2,3,..., the highest rank being 1). It is to:

[ ] find and read materials required for a course [ ] read for general knowledge
[ ] do research for term paper/senior essay [ ] do research for publishable paper/book [ ] use the library facilities or reading own materials
[ ] do research for article contribution [ ] refer materials for decision making
[ ] Others, please specify_____

III. **USERS' REQUIREMENTS**

7. Which one of the following information services would you like to get from the Manuscript and Documentation Center at IES?

[ ] Reference service (furnishing records for use within the reading room)
[ ] Bibliographical services (Providing information on published materials)
[ ] Information service (Providing written replies using form, letters, etc. for example, on facts)
[ ] Making copies of records
[ ] Exhibiting records
[ ] Other services, please specify_____

8. Rank the following types of collection you frequently refer. (give 1,2,3,..., the highest rank being 1)

[ ] Manuscripts (parchment and paper materials) [ ] Research materials
[ ] Correspondences/memorandum [ ] Personal papers
[ ] Diary [ ] Report [ ] Minutes of a meeting
[ ] Photographs [ ] Micro films and slides
[ ] Sound recordings [ ] Clandestine literature
[ ] Others_____

9. Which format of library materials do you prefer most?(rank them by giving 1,2,3,..., the highest rank being 1)

[ ] Written form [ ] Sound form [ ] Microform [ ] Diskette/machine readable form
[ ] Others, please specify_____

10. Which one of the following materials do you prefer to use most?

[ ] Materials in Ethiopian languages [ ] Materials in foreign languages

11. What aspects of information do you consider as the most important factor to your information requirement? (rank them by giving 1,2,3,..., the highest rank being 1)

[ ] Timely information
[ ] Pertinent and relevant information to the immediate need
[ ] Reliable information
[ ] Information presented in simple, direct form
[ ] Ease of access to the information service and resources
[ ] Others, please specify_____

12. From the above stated aspects which ones are lacking in the IES Manuscript and Documentation center?

[ ] Timely information
[ ] Pertinent and relevant information to the immediate need
[ ] Reliable information
[ ] Information presented in simple, direct form
[ ] Ease of access to the information service and resources
[ ] Others, please specify_____

IV. AWARENESS

13. Have you heard or used any where else services like Selective Dissemination of Information(SDI), Current Awareness Service(CAS) and Retrospective Search Services etc.?

Heard [ ] Yes [ ] No
Used [ ] Yes [ ] No

If you used such services, were they helpful?

Service	Place	Useful	Not Useful
SDI			
CAS			
Retrospective Search			
Others			

VI. ACCESS

14. How do you go about identifying the materials you would most like to refer to? (rank them by giving 1,2,3,..., the highest rank being 1)

[ ] Consult card catalogues [ ] Use register book [ ] Ask library staff
[ ] Others (please specify)_____

15. How do you search the materials you need? It is by using:

[ ] subject [ ] date [ ] the name of a person or record creating entity
[ ] the description of the document [ ] geographical area
[ ] Other (please specify)_____

16. What problems do you face while using these methods of searching?

[ ] The terms are not provided as finding aids(i.e. catalogue, index, etc.)
[ ] Although they are found they are not clearly put in finding aids
[ ] They do not match with the physical location of the materials
[ ] Other problems_____
_____

17. What kinds communication barriers are there between you and the library staff? (if any)

[ ] Language (no common language to communicate)
[ ] Understanding (because either of you are using unusual or technical terms)
[ ] Ignorance(they give you little or no attention).
[ ] Others, please specify_____

VII. GENERAL

18. Generally, what do you think about the adequacy of the service that you get at the IES Manuscript and Documentation Center and its collection in relation to your needs?

[ ] Very satisfactory [ ] Moderately satisfactory [ ] Satisfactory [ ] Unsatisfactory

19. If your answer to question no. 18 is 'unsatisfactory' what do you think are the reasons?

[ ] Lack of proper finding-aids (catalogues, guides, indexes, etc.)
[ ] No timely service
[ ] Insufficient collection
[ ] Poor physical condition of the collection
[ ] Inconvenience of material format
[ ] Not enough reading room and space
[ ] Staff's inability to assist needs of the user
[ ] Language problem
[ ] Other reasons, please specify_____

20. Do you think that the cause of the problem is related to not using computer?(Please explain)

_____

_____

21. If computerization is recommended, which finding aid do you expect most to be included?

[ ] Catalogues [ ] Indexes [ ] Subject lists [ ] Guides to Microfilms
[ ] Guides to Photographs [ ] Guides to Maps
[ ] Others, please specify_____

22. What type of additional services do you think will enable to improve the shortcomings of the Manuscript and Documentation Center?

_____

_____

23. Any Additional Remarks

_____

_____

APENDIX 2

ADDIS ABABA UNIVERSITY SCHOOL OF INFORMATION STUDIES FOR AFRICA

DISCUSSION GUIDE FOR THE HEAD OF MANUSCRIPT AND DOCUMENTATION CENTER AT IES

INTRODUCTION

This discussion guide is aimed at gathering facts, identifying problems which are specific to the information handing practices of the center and the major causes of these problems.
Thus, study is being undertaken for the thesis work by a gradual student of School of Information Studies for Africa, Addis Ababa University for fulfilling the requirements of the N.Sc. I.S. program. The topic of the study is Designing and Development of an in-house Database for Archival and manuscript Records Management. Your assistance in providing the correct information is highly appreciated and the responses will make the results of the study more appropriate in improving the information handing activities and services given to the users.

I. IDENTIFICATION

1. What is your responsibility, education and work?

II. ORGANIZATION AND RELATIONSHIP

1. What is the objective of the center?
2. What are the information related activities of the center?
3. How is the center structured (organizationally) managed and financed?
4. Is there any information flow between you and other departments?

5. Is there any collaboration programs like interlibrary loan making /receiving to/ from other similar institution/ library?

III. COLLECTION

1. What type of collection does the center has and in what format and language?
2. What is the size of he collection across each collection type? What is the approximate percentage distribution of records by language?
3. What is the monthly addition of each type of the collection (on the average)?
4. How do you acquire /accession the materials and what sort of record is maintained?
5. How many donors /record originating entities do you have?
6. Is it possible for you to take inventories of your collection at the required frequency?

IV. STORAGE

1. Is there enough space to store the material?
2. Are the facilities (equipments and materials) suitable fro the collection?
3. Is the environment conducive (i.e. free of dust, pollution, insects, etc.)

V. ARRANGEMENT

1. What principle of collection arrangement do you follow? (provenance, original order, other)
2. How many levels are there in organizing the collection?

VI. ACCESS/DESCRIPTION

1. What type of finding-aids (catalogue, guide, inventory, calendar, list, index, etc.) do you have?
2. How are each type of these finding aids organized?

3. Do these finding aids contain complete and u[-to-date information about the collection?
4. Do you use any of the cataloguing rules or standard description for preparing catalogues?
5. How fast on can retrieve an information from any one of the finding-aid?

VII. SERVICES AND USERS

1. What type of services does the center provide?
2. what access policy are available?
3. Who are the major users of the center?
4. How do users usually make their queries? Is there any query form?
5. Which type of collections are frequently requested?
6. Do you have services like Current Awarcncss Services, Selective Dissemination of Information, Indexing and Abstracting etc.?
7. How do you publicize the holdings of the center?
8. Do you conduct a user survey? How frequent is it?
9. Do you have any in-house publication used to disseminate in published from information on your collection? What is the frequency of issues and can you do it at the required frequency?

VIII. CIRCULATION OF MATERIALS

1. What sort of movement of records involve both within and outside the center? (type of movement).
2. Are there any tracking records maintained? How efficient are they?

IX. GENERAL

1. What problems is the center facing in relation to handling information on the collection and providing services to users?
2. What are the major causes of these problems?

3. Do you think that automation can solve the problems? Is there any intended plan to automate the services and functions?
4. What benefits do you expect from automation?
5. What other solution than automation do you recommend to solve the problem of the center (fully/partially)?
6. What is your reaction to new technologies like:-

   Intermit?

   Electronic Image Processing?

X. RESOURCE AND FACILITY

1. What sort of equipment does the center has?
2. how many employees do you have and what is their qualification?
3. Is there a separate budget for the center? If yes, what is the approximate budget for different operations of the center?
4. Do you have any additional remark?

DECLARATION

This thesis has not been submitted by any person for a degree in any other university and it is my original work. All sources of material used for the thesis have been acknowledged

Getahune Semeon

The thesis has been submitted for examination with my approval as university advisor

Tesfaye Biru

Sisay Fiseha

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