CHAPTER – I

INTRODUCTION
1.0 Introduction

Information technology (IT) refers to the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware (Wikipedia, 2010). The advent of information and communication technologies and its penetration into all walks of life has brought such profound changes that have never been observed before.

To meet the growing challenges posed by the exponential proliferation of information, libraries adopt information and communication technologies to accelerate the process of information processing, organization, storage, retrieval, and dissemination.

According to Ramzan and Singh (2009) IT eliminates uninteresting and repetitive work, helps to avoid duplications of effort, increases the range of services, provides marketing opportunities, facilitates cooperation and the formulation of networks and resource sharing in libraries. These technologies enable users to have on-line remote access to library collection round the clock, and several users can reach same electronic resources simultaneously within or outside physical library which is easy and time saving.

Information technology (IT) entered into libraries, especially academic and research libraries, during the 1960s. Libraries, at the beginning, employed information technologies to speed up their daily activities and reduce their operation costs (Mohsenzadeh and Isfandiyari-Moghaddam, 2009).

Studies on information technologies in Iran indicate that computerization of library systems and services in Iran started in the late 1970s and resumed after an apparent gap in 1980s. However, this trend has accelerated in the last decade especially in institutions of higher education as a result of an increased number of users, greater demand for the use of library materials within and outside the libraries, increase in the amount of materials being published, changes in the nature of reading material, and the development of new and cheaper computers (Safahieh and Asemi 2010; Farajpahlou, 2002; Ramzan, 2004).
According to Moorthy (2000) many of the libraries and information centers in India started using computers for their works after the introduction of mini computers during late 1970s, since these were costly, in the beginning only elite institutions of the public, academic, Research and Development (R&D) and private sectors could afford them, the libraries in these institutions were able to utilize them to some extent. Library automation, as a result did not progress satisfactorily. However, the arrival of microcomputers and personal computers (PCs) in Indian market in the 1980s gave the necessary impetus, the environment began to change and library automation picked up momentum.

The dominant role played by information technology in handling of information made libraries in general and medical libraries in particular to move further and faster towards total automation. As a result, there is a paradigm shift from traditional print to electronic media, from ownership of documents to accessing information, from intermediary services to end-user services. These has changed library users expectations and hence brought about dramatic changes in librarians roles. To meet the current requirements, library professionals must be able to perform various tasks coping with the changes in technological environment (Babu et al., 2007).

In view of the above facts an attempt has been made here to study and know about the IT skills needed for LIS professionals of medical libraries in India and Iran.

1.2 Information Technology Skills - A Must for Medical Librarians

Over the past decade computer and other communication technologies have revolutionized human society. Medical Library as a social institution and librarianship as a service-oriented profession are now at the focal point of rapid social, cultural and technological changes.

At present the medical library environment is completely different from that of a century ago. The digital revolution has given birth to digital libraries and electronic material. Coupled with the arrival of the Internet, increasing development in the World Wide Web is fast transforming library services and librarians’ roles.
In this new environment, in order to discharge their responsibilities, it is imperative for medical librarians to be competent in web designing, creating databases and portals, web publishing, managing information networks and so on (Brown, 2004; Blackwelder and Dimitroff, 1996; Braude and Wood, 1993; Funk, 1998; Morgan, 1996; Scherrer, 2004; Scherrer and Jacobson, 2002)

1.3 Need and Importance of the Study

Health development is a pre-requisite to socio-economic development. Over the past three decades, Iran has taken significant steps to improve the quality of health care delivery and medical education (Azizi, 2009). On the other hand in India enormous efforts have been made for the development of medical education and health care. Thus, there is steady increase in the number of medical colleges and schools for imparting graduate, postgraduate, specialized, and super specialized courses in both countries. The faster growth of medical institutions in India and Iran paved the way for development of libraries on the lines of information and communication technology.

The technological revolution has brought changes in the generation of different forms of information resources. There exist various types of information resources in different locations, modes, formats, channels in the form of e-resources like online journals, e-books, databases, organizational websites, institutional repositories in medicine and health sciences. This shift has thoroughly transformed medical libraries in terms of their functions, role, services, facilities, and physical structures.

To operate effectively in the new network environment, should be the goal of every LIS professionals. Traditional skills are no longer adequate for those who want to be effective professionals in the new electronic era. To provide effective services to their clients, LIS professionals need to be competent in emerging areas such as library automation, database creation and retrieval techniques, multimedia application, networking, design and development of library websites and digital library, and content development and management.
Cohn and Kelsey (2005, Cited in Leong, 2008, p.80) give several reasons in support of developing a list of competencies/skills for librarians. Included are: their usefulness in helping the library to respond to changing client needs and expectations; their value in helping staff understand what is expected of them; and the information they provide for assessing development needs and creating a staff development program.

As observed in the literature review, although there exist studies on IT application and IT skills in India and Iran, no comprehensive survey has been done to study medical librarians’ level of information technology skills based on professional bodies benchmarks. Therefore, the study is significant due to the fact that it aims at the identification of IT skills that are deemed essential for LIS professionals in general and medical librarians in particular, in India and Iran. The results of this study will also provide scholars in the medical LIS studies field with research that addresses information skills and training for medical library staff, such as planning, implementing, and evaluating future training programs.

1.4 Statement of the Problem

Library and Information Science researches have become increasingly concerned with the challenges of new information technology which has penetrated into the libraries (Braude and Wood, 1993; Brettle, 2008; Law, 1984).

This new information era has resulted in the changing roles of library and information professionals in general (Ansari, 2007; Kargbo, 2002; Omekwu, 2008), and health science librarians in particular (Killingsworth, 2000; Scherrer and Jacobson, 2002). Since medical libraries in India and Iran possess the infrastructure for ICT-based services, in order to be able to use ICT effectively to discharge their professional responsibilities, medical librarians in India and Iran need to acquire knowledge of skills in information technology. Therefore, there is an urgent need to study IT skills needed for LIS professionals working in medical libraries.

Hence, the research problem is conceived under the title “IT Skills among LIS Professionals of Medical Libraries in India and Iran: A Comparative Study”.
This study describes and analyzes the level of IT skills among medical librarians in two nations-India and Iran, Medical librarians’ preferences for IT training agencies, problems and constraints in acquiring IT skills, and modes and methods of acquiring IT skills.

1.5 Definition of the Concepts

In this section definition of some technical concepts such as information technology, library professionals, library professionals, Medical libraries, and skill used in this study are provided.

1.5.1 Information Technology


A generic term that covers the acquisition, processing, storage and dissemination of information of all types-textual, numerical, graphical and sound, and in all application areas, e.g. banking, business, science, technology, not just librarianship and information science. The term is restricted to systems dependent on a microelectronics-based combination of computing and telecommunications technology. In recent years, particularly in the UK education sector, has been replaced by 'ICT': Information and communication Technology.

According to ODLIS—Online Dictionary for Library and Information Science (Reitz, 2004) A very broad term encompassing all aspects of the management and processing of information by computer, including the hardware and software required to access it.

According to the Wikipedia, the free encyclopedia (2010) Information Technology (IT), as described by the Information Technology Association of America (ITAA), is "the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer
hardware." IT deals with the use of electronic computers and computer software to convert, store, protect, process, transmit, and securely retrieve information.

1.5.2 Library Professionals

The term 'professional' has been defined by *The Concise Oxford Dictionary* (Pearsall, 2000) as engaged in an activity as a paid occupation rather than as an amateur and a person having impressive competence in a particular activity.

In this study library professionals refer to chief librarians of Medical, Dental, and Pharmacy Colleges in India and Iran. Since in most medical, dental, and pharmacy colleges in Iran an academic member with qualification other than Library and Information Science is in charge of the library, in this study chief librarian of those libraries refers to a Library and Information Science degree holder who acts as deputy librarian of those libraries.

1.5.3 Medical Libraries

In this study Medical libraries refer to libraries attached to Colleges of Medicine, Dentistry, and Pharmacy.

1.5.4 Skill

*Rehman et al* (1997) identified skill as being the ability to use one's knowledge effectively.

1.6 Objectives of the Study

The main objective of this study is to investigate and compare IT skills among LIS professionals of medical (Medical, Dental, and Pharmacy) libraries in India and Iran. The specific objectives of the study are as follows:

1. To identify medical librarians’ level of skills in automated systems, data standards, and System Analysis Techniques in India and Iran;
2. To study medical librarians’ level of skills in acquisition, use, and evaluation of information technologies;

3. To assess medical librarians’ level of skills in integrated systems and technologies;

4. To examine medical librarians’ level of skills in Technology solution for permanent access to electronic information;

5. To identify medical librarians’ level of skills in applications of emerging areas of biomedicine, computational biology and health information, including electronic health care systems and records;

6. To assess medical librarians’ level of skills in communication and information infrastructure including the Internet and Web;

7. To study medical librarians’ level of skills in creating information access and delivery solutions;

8. To identify medical librarians’ level of skills in databases, indexing, and information analysis and synthesis;

9. To understand medical librarians’ preferences for training agencies, and mode of IT training for upgrading their knowledge and skills; and

10. To unfold the obstacles impeding acquiring information technology skills by medical librarians

1.7 Hypotheses of the Study

The hypotheses envisaged are:

1. Medical LIS professionals in India and Iran do not differ significantly regarding skills in automated systems, and data standards.

2. Medical LIS professionals in India and Iran do not differ significantly regarding skills in Web-based Knowledge Management and content development tools.
3. Medical LIS professionals in India and Iran do not differ significantly regarding skills in standards for medical systems.

4. Indian and Iranian medical LIS professionals’ skills in Internet, Web and networking do not differ significantly.

5. Medical LIS professionals’ skills in electronic document delivery systems do not differ significantly.

6. Medical LIS professionals’ skills do not differ in database searching strategies and techniques, medical and allied health databases, and indexing.

1.8 Scope and Limitation

The study intends to cover the chief librarians working in libraries attached to Medical, Dental, and Pharmacy colleges affiliated to Rajiv Gandhi University of Health Sciences (RGUHS), Karnataka state, India; and the chief librarians working in medical, dental and pharmacy college libraries affiliated to the Ministry of Health and Medical Education (MOHME), Iran. Websites of RGUHS and MOHME were used to identify the names and addresses of libraries for the study.

The IT skills for the purpose of study consisted of automated systems; data standards; system analysis; evaluation of information technologies; federated and meta search engines; RFID; Web-based knowledge management tools; content development tools; digital archiving and preservation; bioinformatics databases; standards for medical systems; health informatics products; communication and information infrastructure; electronic document delivery systems; database searching strategies; medical databases; data warehousing and data mining; and indexing. The geographical coverage of medical libraries is limited to Karnataka state in India and all provinces in Iran.

1.9 Methodology and Sources of Data

The researcher began the investigation with literature search. For this purpose e-journals with full text available under UGC-INFONET digital library consortium, including Wiley InterScience, Emerald, Science Direct, and JCCC; Scopus, LISA, and
Medline have been browsed. In addition to this, information available on Directory of Open Access Journals (DOAJ) and other searchable databases were selected and recorded.

A survey method of research has been adopted to collect primary data about medical librarians’ IT skills, both in India and Iran. A well-structured questionnaire containing various IT skills was designed to be administered to medical librarians in India and Iran. In order to confirm the validity of the questionnaire, it was exposed to three experts for consultation. The experts were briefed about the purpose of the study and they were asked to review the questionnaire critically. They made valuable suggestions, which were incorporated into the questionnaire. The suggestions made were helpful in making necessary changes and improving the questionnaire.

After the necessary revisions were made, preliminary questionnaire was piloted. The purpose of pilot study is to obtain information to improve the questionnaire content, eliminate ambiguity in some questions and to fine-tune the questionnaire. Based on the information elicited in pre-test study, the questionnaire was further improved and revised in its format, content and sequence for final use in the survey. Moreover, the final questionnaire was translated into Persian.

To collect the primary data on IT skills among medical librarians, the researcher identified 135 medical, dental, and pharmacy colleges in India, and 76 medical, dental, and pharmacy colleges in Iran. Two hundred and eleven questionnaires were distributed among chief librarians, through e-mail, mail, and personal visits, out of which 166 (101 India and 65 Iran) useable questionnaires were returned, giving the response rate of 78.7%. Further, informal interview was done with medical librarians to ensure clarity and authority of data. The filled questionnaires were organised, coded and analysed. They were interpreted in the light of the objectives and hypotheses. In analysing and interpreting the data, different statistical measures like Frequency, Percentage, Mean, Standard deviation, Chi-square Test, Independent-Samples T-Test, and Contingency Coefficient were utilised. Tables, charts and figures were used to make the presentation clear and simple.
1.9.1 Development of Data Collection Instrument

To design the questionnaire on IT skills and in order to find standards and benchmarks for IT skills recommended for medical librarians, websites of professional library (medical and non-medical) associations have been searched and a bibliography of skills statements, guidelines, as well as published articles have been prepared. The above mentioned professional associations and IT skills recommended by them are as follows:

1.9.1.1 Medical Library Association (MLA) Skills Statements

Medical Library Association (2007) identifies seven professional competency areas needed by Medical librarians today, each competency area is consisted of several skills, these areas and related skills are as follows:

1. Understand the health sciences and health care environment and the policies, issues, and trends that impact that environment
2. Know and understand the application of leadership, finance, communication, and management theory and techniques
3. Understand the principles and practices related to providing information services to meet users’ needs
4. Have the ability to manage health information resources in a broad range of formats
5. Understand curricular design and instruction and have the ability to teach ways to access, organize, and use information
6. Understand scientific research methods and have the ability to critically examine and filter research literature from many related disciplines
7. Understand and use technology and systems to manage all forms of information (which is considered in this study) includes:
   - Basic principles of automated systems, data standards, and systems analysis techniques including design and evaluation
   - Acquisition, use, and evaluation of information technologies
Integration of systems and technologies

Technological solutions for permanent access to electronic information

Applications in emerging areas of biomedicine computational biology and health information, including electronic health care systems and records

Communications and information infrastructure including the Internet and Web

1.9.1.2 Special Libraries Association (SLA) Skills Statements

Special Libraries Association (2003) describes professional competencies as the practitioner's knowledge of: information resources, information access, information technology, and information management. According to SLA there are four major competencies, each augmented with specific skills:

1. Managing Information Organizations (Information professionals manage information organizations ranging in size from one employee to several hundred employees.)

2. Managing Information Resources (Information professionals have expertise in total management of information resources including: identifying, selecting, evaluating, securing and providing access to pertinent information resources.)

3. Managing Information Services (Develops and maintains a portfolio of cost-effective, client-valued information services that are aligned with the strategic directions of the organization and client groups.)

4. Applying Information Tools and Technologies (which is considered in this study) includes skills to:

   - Assess, select and apply current and emerging information tools and create information access and delivery solutions;
   - Apply expertise in databases, indexing, metadata, and information analysis and synthesis to improve information retrieval and use in the organization;
Maintain current awareness of emerging technologies that may not be currently relevant but may become relevant tools of future information resources, services or applications.

Based on above mentioned guidelines and statements as well as published articles and monographs a questionnaire containing various aspects of IT skills was designed. The IT skills incorporated into the questionnaire are as follows:

1. **Automated Systems**

   - Integrated Library Management Systems (e.g. Koha, EasyLib, LibSys, Nosa, Pars Azarakhsh, etc.)
   - Information Retrieval Systems (e.g. CDS/ISIS/WINSIS/WebISIS)
   - Bibliographical Utilities (e.g. OCLC, LocatorPlus)
   - Technologies used for reference services (e.g. Chat, Video Conferencing, etc.)

2. **Bibliographic Standards or Data Models**

   - Z39.50
   - RDF (Resource Description Framework)
   - DC (Dublin Core)
   - MARC21 (Machine readable Cataloging)
   - AACR2 (Anglo American Cataloguing Rules)
   - MeSH (Medical Subject Headings)
   - LCSH (Library of Congress Subject Headings)

3. **System Analysis Techniques**

   - Preliminary Investigation
   - Problem Identification
   - Requirements Analysis
   - Decision Analysis
4. Acquisition, Use, and Evaluation of Information Technologies

- Technical Skills in Computers
- Skills in using electronic resources including e-journals, e-books, e-thesis, electronic databases etc
- Skill in Comparing Hardware/Software Technologies
- Transaction Log Analysis
- Electronic Resource Assessment/Management Systems

5. Integration of Systems and Technologies

5.1 Federated/Meta Search Engines
- Google Scholar
- Scirus
- Dogpile
- Vivisimo
- Kartoo
- Mamma

5.2 RFID (Radio Frequency Identification)

5.3 Web-Based Knowledge Management Tools
- Wikis
- RSS
- Blogs
- Social Networking Services (SNS)
- Mashups
5.4 Content Development Tools

- Ontology/Taxonomy
- Artificial Intelligence

VLE (Virtual Learning Environment e.g. Blackboard, WebCT, eCollege, etc.)
- Learning Objects
- Content Management Systems (CMS e.g. Joomla, Drupal)
- Referencing software (EndNote, RefWorks, and Zotero)
- Digital Libraries (e.g. GreenStone, Fedora, Dspace)
- Optical Character Recognition (OCR)
- Digital Asset Management Systems (DAMS)
- Meta Search Systems (e.g. MetaLib, WebFeat)
- Virtual Reference Services (Chat, Video Conferencing e.g. hitchhikr, EdTechTal, etc; Voice Over IP e.g. Skype Gizmo, etc.)
- Open-URL Link Resolver
- Remote PatronResolver (RPA)
- Metadata Systems
- Electronic Reserve Systems
- Programming Languages (e.g. C, C++, Perl, Java,)

6. Technological Solutions for Permanent Access to Electronic Information

- Digital Archiving and Preservation

7. Emerging Areas of Biomedicine, Computational Biology and Health Information Including Electronic Health Care Systems and Records

7.1 Bioinformatics (Computational biology) Databases
GenBank
EMBL (European Molecular Biology Laboratory)
DNA Data Bank of Japan (DDBJ)
SWISS-PROT
PIR (Protein Identification Resource)

7.2 Standards for Medical Systems
UMLS (Unified Medical Language System)
RxNorm (provides normalized names for clinical drugs)
SNOMED CT (Systematized Nomenclature of Medicine--Clinical Terms)
DICOM (Digital imaging and communication in Medicine)
HL7 (Health Level Seven)

7.3 Health Informatics Products
Mercury (Telemedicine Solution-India)
Sanjeevani (Telemedicine Solution-India)
E-Sushrut (Hospital Information Management System-HMIS-India)
Tejas (Software Suite for Oncology-India)
E-Chavi (Picture Archival Communication System –PACS-India)

8. Communication and Information Infrastructure

8.1 Internet
Internet surfing
Conventional Search engines (Google, bing, altavista, Yahoo, etc.)
Email
TCP/IP (Transmission Control Protocol/Internet Protocol)
Operating Systems (UNIX, LINUX, Windows, etc.)
8.2 Web Awareness

- WWW
- Web Browsers (e.g. Internet Explorer, Firefox, etc.)
- Markup Languages (HTML, SGML, XML)
- Use of OPAC/Web OPAC/OPAC2.0
- Video Conferencing (e.g. hitchhikr, EdTechTal, etc)
- Voice Over IP (e.g. Skype, Gizmo, etc.)
- Web page design
- Web site administration
- Subject gateways

8.3 Networking

- LAN/WAN (Local Area Networking/Wide Area Networking)

9. Electronic Document Delivery Systems

9.1 The ability to provide library users with access to their required information through applying IT

9.2 Document Delivery Systems

- Chemical Abstracts Service Document Detective Service (CASDDS)
- Blackwell's Uncover
- BIOSIS Document Express
- ISI Document Solution
- British Library Document Supply Centre (BLDSC)
- DELNET

10. Databases

10.1 Database Skills
Database Management Systems (DBMS/RDBMS: MySQL, ORACLE)

- Install Databases
- Maintain Databases
- Administer Databases

10.2 Database Searching Strategies and Techniques

- Logical, Boolean combination of terms
- Weighting of term
- Truncation of terms
- Keyword, uncontrolled vocabulary searching
- Controlled vocabulary searching
- Pre-coordinated vocabulary searching
- Post-coordinated vocabulary searching
- Searching classified arrays
- Citation searching

10.3 Medical and Allied Health Databases

- PubMed/MEDLINE
- Toxicology Literature Online (Toxline)
- AIDSinfo
- International Pharmaceutical Abstracts
- Chemical Abstracts
- EMBASE: Excerpta Medica Database
- Cochrane Library
- ParsMedline (Iranian National Medical Database)
- IranMedex (Iranian National Medical Database)
- IndMED (Indian National Medical Database)

10.4 **Information Analysis and Synthesis**

- Data Warehousing and Data Mining Techniques

10.5 **Indexing**

- KWIC (Keyword in context)
- KWOC (Keyword out of context)
- Rotated and permuted keyword indexing
- Statistical approaches, including term frequency, co-occurrence, distribution
- Computer-assisted indexing
- Controlled vocabulary indexing
- Post-coordinated indexing
- Pre-coordinated indexing
- Use of Weighted terms

1.9.1.3 **Data Collection Instrument**

To elicit information on the level of medical librarians’ information technology skills, a questionnaire was developed. The questionnaire consisted of six parts with overall fifty-nine questions. The questions included filled in, two way questions (yes/no), multiple choice questions and scale. The scale questions were on five-point scale. The final questionnaire is composed of different aspects as mentioned below:

1. Part I: Personal Data

This section contains filled in type questions and one tick type question (No. 1-8) and deals with librarians demographic qualification including: name, educational qualification, specialization, designation, gender, age, work experience, and membership to professional bodies.
2. Part II: Institutional Data

This part contains filled in questions (Nos. 9-23) on background information of the medical institutions and libraries including: name and address, Web site address, phone/Fax/email, date of establishment, college management, location of the college, types of courses offered by the college, available manpower in the library, user strength of the library, annual budget, and total collection of the library.

3. Part III: Attitude to Information and Communication Technology/Information Technology (ICT/IT)

This part contains a multiple choice question having five statements (No. 24) and deals with respondents overall attitude to information and communication technology.

4. Part IV: Information Technology Usage

This section contains one tick type having 17 statements, and two multiple choice questions (Nos. 25-27) on types of IT used; frequency, and experience of IT usage.

5. Part V: Information Technology Skills

This part contains total 24 (Nos. 28-52) questions having varied number of answers. Against each answer 1 to 5 scales are given. The respondents have marked against the number that fit most to their level of skills. This part deals with skills in automated systems, data standards, system analysis, use and evaluation of information technologies, federated and meta search engines, RFID, web-based Knowledge management tools, content development tools, digital archiving and preservation, bioinformatics (computational biology), standards for medical systems, health informatics products, communication and information infrastructure, electronic document delivery systems and provision of information, data warehousing and data mining, indexing, database searching strategies, and medical databases.

Part VI: Information Technology Training

This part deals with IT training and contains total 7 (Nos. 53-59) questions. One question (No. 53) is Yes/No type question. Five questions (Nos. 54-58) are multiple choice questions. Question 59 is suggestions from librarians.
1.10 Chapterization

The thesis is presented in seven chapters

Chapter-I: Introduction

Introduces the research problem, highlights the need and importance of investigation, it states the problem, defines the terms and presents the objectives and hypotheses of the study, it also explains the methodology, data collection and analysis, the scope and limitations of the study. Development of data collection instrument, and the data collection instrument itself is also outlined.

Chapter- II: Review of Literature on Information Technology Skills and Related Issues

Presents a literature review on the research topic and related aspects of the theme. Apart from the literature on IT skills, the aspects of study included IT application and implication, training on information technology, and computer and information literacy. It also covers studies conducted on IT skills by scholars in India and Iran as well as other countries.

Chapter-III: Information Technology Skills: An Overview

Gives an overview of information technology skills in automated systems; data standards; systems analysis techniques; transaction log analysis; Electronic Resource Assessment/Management Systems; content development; Federated/Meta search engines, Radiofrequency Identification (RFID); Web-based Knowledge Management; digital archiving and preservation; computational biology databases; medical informatics standards; telemedicine and hospital information systems; Internet and Web; document delivery services; databases searching strategies and techniques; medical and allied health databases; abstracting and indexing; and data warehousing and data mining
Chapter- IV: Health Sciences Education and Libraries in India and Iran: An Overview

Gives an overview of medical, dental, and pharmacy education in India and Iran, the statutory bodies, along with their history, objectives, and functions; medical libraries; infrastructure for Internet and e-learning; and medical and allied health consortia in both countries.

Chapter-V: Medical Colleges and Medical Librarians Profile

Gives a profile of medical libraries covered under the study; including country-wise distribution of medical institutions, types of management, geographical location of colleges, age-wise distribution of colleges, courses offered, as well as annual budget. Medical librarians profile is provided including age-wise distribution of respondents, educational qualification, area of specialization, designations of the heads of the libraries, total work experience of the heads of the libraries, and membership of the respondents to the professional bodies.

Chapter-VI: Medical Librarians’ Information Technology Skills

Is the heart of the research result; it presents data relating to LIS professionals' Information Technology skills, recommended by MLA and SLA, in India and Iran.

Chapter-VII: Summary and Conclusion

Is a concluding chapter. It presents a summary of the findings and conclusion, wherein the findings of the study are presented briefly. These findings are followed by certain suggestions to overcome problems faced by the librarians for enhancing IT skills. It also gives suggestions and recommendations for further investigations.

General Information Relating to Medical Colleges; Man Power and User Strength; Total Collection of the Libraries; Bibliographical References and the questionnaire are presented at the end.