

# Collection development in digital environment: a case study

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## Abstract

Collection development in digital library environment is still a burning topic. Many lessons can be learnt concerning issues of collection development in digital environment from the case study of different kinds of libraries. The paper reflects the status of the progression of digitization of Osmania University Library. The paper tries to highlight some salient features of collection development aspects such as procurement of printed as well as digital documents in order to find out the present trends in collection development. The paper is an extension and findings of M. Phil Dissertation reflecting a case study of Osmania University Digital Library, Hyderabad

**Keywords** Collection Development, Digital Library, Digitization, University Library

## Introduction

With the rapid development of information and communication technologies (ICTs) and the advent of Internet, the whole publishing world is revolutionized with print to digital environment. The transition had been reflected greatly in Library and Information Centers, which are being transformed gradually from Traditional Library to Hybrid Library to Digital Library and finally to Virtual Library. The development started in late 1980s and then got momentum in 1990s in developed countries. The developing countries are also slowly moving to the digital environment. Digital Libraries had emerged as a leading edge technological solution to the persistent problems of enhancing access, enduring archive and expanding the dissemination of information. Since the rapid move to a digital environment had changed the taste and preferences of users. Non-availability of documents in print form, opportunities of accessing documents sitting at home forced the libraries to shift gradually from print to digital medium. So is the case of Osmania University Library.

Collection development is backbone to any library and information center, whether it is public, academic or special library. Collection

development is defined as systematic building of information resources in a library and information center. Collection development in digital environment (Demas, 1994,1998; Lee, 1999) is the gradual building up of collections in digital form. Besides, it includes subscription of e-journals and databases with a flavor to archival facility. The aim of collection development is to facilitate access to some of e-journals, e-resources, e-conferences proceedings, databases (full-text and bibliographic databases) to the users on request basis within the campus of the university library.

In the first decade of 21st century, the digital library environment is a perfect blend of internal resources (i.e. institutional resources) and external resources like those, which are having access rights from the publishers through subscription. In digital library environment, some resources are "born digital" and others are needed to be digitized through the process of conversion of printed materials using modern technology. The organization of digital materials is done using metadata like Dublin Core to provide seamless access to the users.

Many institutes have taken digital library initiatives since 1998. But, most popular and big initiative came from the Government of India in collaboration with Carnegie Mellon University (CMU) under the name of 'Digital Library of India (DLI)' (<http://dli.iiit.ac.in>) project to provide full-text access to large number of books having cultural heritage of the country.

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## Background of the Study

Let us have a brief outline of Osmania University (OU) to make a clear concept of the study. With a sprawling campus of nearly 1600 acres, buildings of majestic beauty and architectural splendor, Osmania University is perhaps the largest higher education system in the country. There are approx. 30,000 students in the university and its affiliated colleges. Its faculty and staff members are nearly 1000. It is multi-disciplinary university offering rich and varied courses in the field of Humanities, Arts, Social Science, Law, Engineering, Commerce, Business Management, Engineering and Technology, Information Technology and Oriental Languages. So far as library is concerned, Osmania University has one Central Library and more than 64 departmental libraries. Now, the library committee re-allocates budget under different sub-heads such as Books, Journals, Furniture, Maintenance, Digital Library, and Binding etc. The Central Library is having a collection of more than four lakhs of books, 250 printed journals, many e-journals, e-resources, databases, more than 6000 PhD & M Phil Thesis, important rare collections etc.

The University is having a project under the umbrella of "Digital Library of India (DLI)" [<http://dli.iiit.ac.in/>] project, which is funded by Million Book Project (MBP), Scientific Adviser to the Government of India, Carnegie Mellon University, UK and International Institute of Information Technology (IIIT) Hyderabad. In this project, there are 8 partners from AP, which are as follows:

1. IIIT, Hyderabad (Nodal Center)
2. State Central Library, Hyderabad (Member)
3. Telegu University (Member)
4. Salarjung Museum (Member)
5. University of Hyderabad (Member)
6. Osmania University (Member)
7. City Central Library (Member)

Based on the recommendation of the selection Committee, Osmania University Central Library has decided to go for digitization of at least one lakh of books, which are categorized as rare

documents, old books, out of copyrighted books and deteriorated books. For this purpose, 10 imported scanner from Germany costing Rs.20,00,000 each are installed to scan the books. There are 30 people and one project coordinator to IIT Hyderabad (Nodal Center) who uploads the data in <http://dli.iiit.ac.in/> after verification. It has been observed that the Osmania University digitization project is going on smoothly and in right direction.

## Literature Review

According to Lancaster (1981), "25% percent of reference books will be in electronic form by 1990; 50 percent of existing abstracting services will be available only in electronic form by the end of year 2000; 25 percent of periodicals in science and technology, humanities will be available in digital form by 2005". Covi and Cragin (2004) in their article on "reconfiguring control in library collection development: a conceptual framework for assessing the shift towards electronic or digital collections". They tried to point out the systematic evaluation of non-use of electronic resources. Jones (1999) commented in his article that the collection development in electronic environment presents added new dimension to the traditional library. The university of Hyderabad started project in 2003 and now it is working under the umbrella of 'Digital Library of India'. Indian Institute of Technology Kharagpur took initiative to make available reading materials on Aerospace and Science and Technology to the users using its digital library. CORE Project deals with the digitization of journals, magazines and articles. The New Zealand Digital Library Project is a research programmes at the university of university of Waikato whose aim to develop underlying technology for digital library and make it publicly available so that others can create their own digital library.

## Objectives of the Study

1. To find out what types of collection will be developed under digital environment to meet the demands of users;
2. To find out the policy and process of collection development in digital environment;
3. To find out the impact of digital materials on procurement of print materials;

4. To find out the issues and challenges involved in collection development under digital environment.

Based on the objectives data are collected on the aspects such as: a) data related to digitizing the documents on various languages, b) data related to procurement of books and journals in the printed environment, and c) data related to e-resources. It is a direct method of data collection and the type of data is of Primary Data or Raw Data. The Graphical representation of the data reveals the trend of progress of digitization and also the book procurement during last 5 years i. e 2001-2005. The method of data collection is adopted here is observation, interview and personal contact method. It is a direct method of data collection and the type of data is of primary data or raw data. The graphical representation of the data reveals the trend of progress of digitization and also the book procurement during last 5 years i. e 2001-2005. The data have been collected in detail on book procurement, electronic resources, and

digitization during June to Dec 2006.

#### Trends in OU Digital Library

The Osmania University Digital Library is housed in the ground floor of the Central Library Campus. The digital library has been started in Jan 2005 in the form of project under the name of "Digital Library of India". The following Table-1 describes the growth of scanning at each month during Jan 2005 to Dec 2006. But, the project is still continuing. From the above figure, it has been seen that the scanning of documents is done highest in the month of July 2005 with 747102 pages [see Table-1]. It has also been observed that the progress of scanning is positive upto July 2005 and then the rate of scanning the documents are reducing. It has been drawn the attention that in last three months i.e. Oct, Nov & Dec 2006 the scanning of books are almost negligible due to pending processing works. The following table shows the number of books scanned in different languages during the period of 2005-2006.

**Table 1. No. of Books Scanned during 2005 to 2006**

<b>Digital Library - Osmania University: 2005- 2006</b>		
<b>Months</b>	<b>No of Books Scanned</b>	<b>No of Pages Scanned</b>
Jan-05	709	250453
Feb-05	1741	592192
Mar-05	1552	551338
Apr-05	1895	664203
May-05	1790	629350
Jun-05	1968	710646
Jul-05	2136	747102
Aug-05	2946	721589
Sep-05	1949	621890
Oct-05	896	360365
Nov-05	972	472936
Dec-05	1593	556614
Jan-06	2484	610340
Feb-06	2154	450080
Mar-06	1516	307532
Apr-06	870	266415
May-06	1021	348063
Jun-06	375	137443
Jul-06	352	127558
Aug-06	22	9552
Sep-06	6	2047
Oct-06	0	0
Nov-06	0	0
Dec-06	40	1580
<b>Total</b>	<b>28987</b>	<b>9139788</b>

The above table deals with the number of books scanned along with the number of pages during the period i.e. 2005-2006. It has been reflected in the table that there is not a single document scanned during October and November 2006. The above table shows that there is a huge low rate of scanning during the

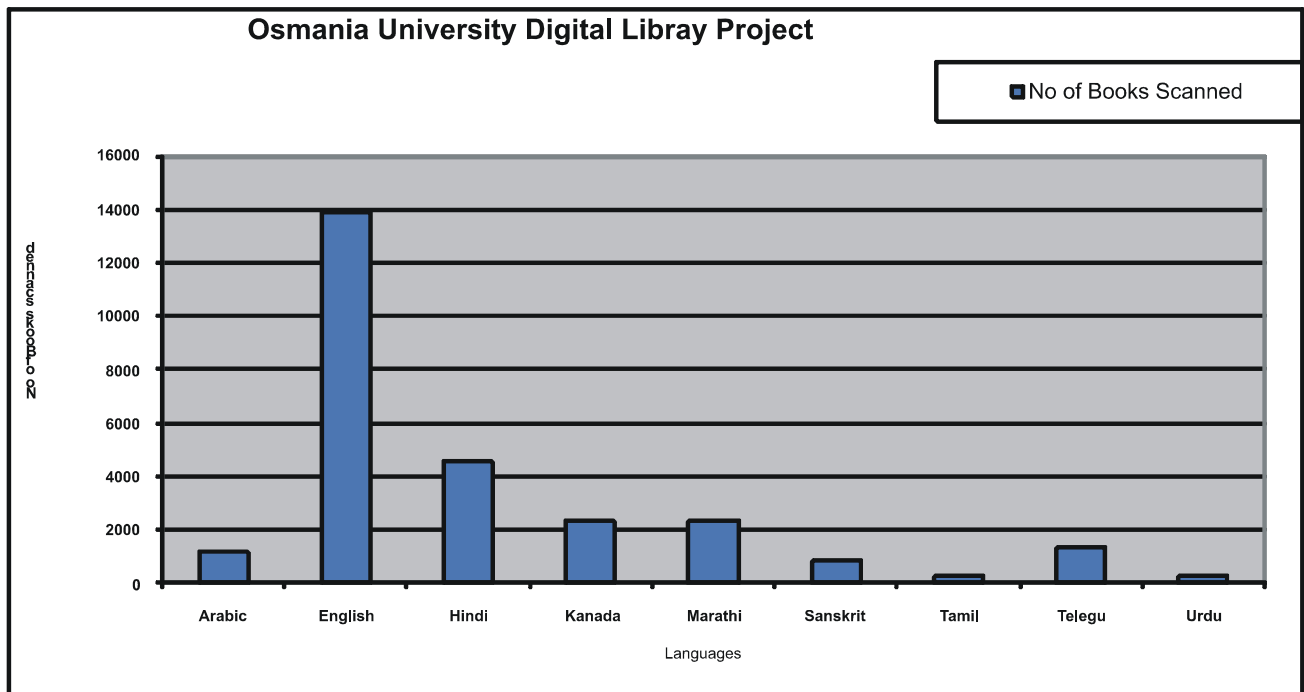
last quarter of the year 2006. It may be due to the pending work of document editing, processing, and quality checking works. Besides, it has also been found low output of scanning due to some trouble in scanner. In fact, the project is still going on with the same set of staff members.

**Table 2. Language-wise book scanned during 2005-2006**

<i>Language</i>	<i>No of Books Scanned</i>	<i>No of pages Scanned</i>
Arabic	1178	369669
<b>English</b>	<b>13887</b>	<b>5150324</b>
Hindi	4596	1214174
Kanada	2357	489280
Marathi	2299	532049
Sanskrit	838	248060
Tamil	263	73666
Telegu	1285	255430
<b>Urdu</b>	<b>215</b>	<b>91674</b>
<b>Total</b>	<b>26918</b>	<b>8424326</b>

The above table-2 describes that under the OU Digital Library Project, the maximum number of books (i.e. 13887) scanned in English Language, whereas the least number of books

(i.e. 215) scanned in Urdu Language. The reason may be the English language book is having a lion share of the total collection of the library.



**Fig. 1. Describes the language-wise book scanned during 2005-2006**

The above figure clearly demonstrates that English language books are scanned highest in number i.e. 13887, which is approximately of 50% of total books scanned during 2005-2006.

Besides, it has been seen that Urdu language books are scanned lowest in number i.e. 215, which is nothing but 0.78%. It has been seen that procurement of books and journals are also

going on simultaneously with the retrospective conversion of old and rare materials of the OU Library in order to keep the cultural heritage intact. To satisfy the users' need, the OU

authority has decided to spend some amount to procure the books as well as printed journals in following years.

**Table 3. Procurement of Books during 2001-2007**

Year	No of Books Purchased	Amount Spent in Rs
2001	2273	8 19917
2002	2051	828887
2003	2521	853963
2004	2373	855500
2005	2530	871145
2006	2620	871145
2007	2650	871145

The trend of book purchase of Osmania University Central Library for last seven years does not change much. In other words, the study finds out that there is stability in the printed book procurement although there is a procurement of e-journals and databases. The above figure shows the trend in book procurement during 2001 to 2007. It reflects that there is a moderate increase in book procurement over the past seven years. It has also been seen that in the year 2002, there is a little decrease in the number of books procurement although there is an increase in budget by one lakh rupees.

The following table-4 shows the procurement of journals both Indian and international and budget year marked during 2001-2007. There is a sharp decrease in budget allocation from 2001 to 2007 (objective-3). In 2001, the total amount of Rs.7, 42,000 has been allocated to purchase both national, international journals and

magazines for the central library of Osmania University, whereas in 2006, the figure was, Rs. 6, 35,000 which means there is a decrease in budget allocation by 14.50% in 2006. It has been seen from the table-4 that equal amount had been sanctioned for the year 2001 and 2002 for the journal procurement. But, there is a decrease by Rs, 22,000 in the year 2003 and 2004. From 2004 onwards, there is a decrease in budget for the printed journals both national and international. The reason may be that the attention is given to procure the e-journals and e-resources(objective-3), CD-ROM databases etc. The following table clearly demonstrates the sharp decrease in foreign journal procurement i.e. from 84 to 51. It has also been noticed that there is a huge decrease in India journal (printed) procurement in 2006 compared to 2001. The reason may be the impact of digital collection and enhanced accessing of e-resources.

**Table 4. Distribution of Journals during 2001-2007**

Year	Foreign Journal	Indian Journal	Amount Spent (Rs.)
2001	84	145	742000
2002		151	742000
2003	72	128	720000
2004	47	165	720000
2005	50	165	635000
2006	51	127	635000
2007	61	135	753000

The above table explains that there is a gradual decrease in journal procurement during 2001 to 2003 but from 2003 onwards there is a sharp decrease in the procurement of foreign journals whereas a sharp increase in the procurement of Indian Journals. It is noticeable that there is a

decrease of 37.5% in foreign journal procurement during 2001 to 2007.

#### **E-Resources of Osmania University**

The Osmania University Library has the following E resources. These can be accessed through (<http://www.osmania.ac.in/e->

journals.htm) using valid IP-address through the university campus only. All the following resources are free to the OU users. These can be categorized as follows: -

#### **INDEST - E-journals Consortium**

**J-GATE Journals** (<http://j-gate.informindia.co.in>).

1. It is an electronic gateway to global e-journal literature.
2. J-gate provides access to millions of journals article available online offered by 5000 publishers. It has coverage of 15517 e-journals with links to full-text at publishers site.
3. It also covers 3921 open-access online journals and maintained links to them
4. It covers 671 online journals which are not available in print version

#### **ASME Journals**

1. It covers more than 70 international journals spreader over around 30 subjects;
2. It mainly covers mechanical engineering

#### **IEEE Journals**

1. It is the biggest portal of electronic as well as printed journals collection.
2. It has more than 1000 e-journals, which are of very high quality peer-reviewed journals
3. Through IEEE explorer, journals can be accessed through user name and password

#### **INFLIBNET Journals** (<http://unicat.inflibnet.ac.in/econ/mindex.htm>)

1. INFLIBNET is providing a great service to all universities, who are the member of **INFLIBNET**;
2. INFLIBNET is providing access to many journals to the member universities through UGC Infonet e-journals consortium. Under UGC INFONET, the Osmania University is providing service to the users through the following publishers
3. Chemistry.org; Institute of Physics; E-Kluwer; Portal Press; Blakwell Publishers; Annals Reviews-Gate; Springer Link; Science Online; APS (American Physical Society); Taylor & Francis; Oxford University Press;

Royal Society of Chemistry; Project Muse.

#### **E-Physics**(<http://ephysics.ephysics.ucla.edu>)

ABC's of Motion; Cause of motion; E&MI; Wave and light-sound; Heat & Matter; Mathematical physics & Application Physics.

#### **Issues and Challenges**

The following are some of the important issues and challenges faced during digitization process with regard to collection building in the OU central library.

**Technical Process:** One of the important issues related to the collection development is technical process. In digital library environment, cataloguing and classifying the digital document is a real problem. Therefore, it's a great challenge for the library professionals to organize the digital documents and making them accessible to the users. Besides, the digitization process at OU Library is in progress, therefore, lots of technical difficulties have to be faced by the staffs. The Osmania University Digital Library Center has the capacity of 30 computers with high configuration (Compaq & Acer, P4, RAM 700MB, Intel 3.0 GHz). There are 10 scanners, which have been brought from Germany (Model No. Zeutscher OS-5000) each costing Rs.20,00,000. The scanner is very powerful and having a capacity of scanning 500 pages per hour. It can scan A3, A4 & A2 type of pages. Scanning is done in gray scale with 600 dpi. All the scanners are having zooming facility. Each scanner can scan approx 30,000 pages per day. In order to perform better in scanning, it is required to maintain the room temperature at negative (-), if not possible at least 170 C using Air Conditioning. But, the limitation of the scanner is that the scanning of the pages cannot be done with colour.

**Manpower:** Another serious challenge for OU Library is the lack of sufficient and quality manpower. As the society is moving from print environment to digital environment day-by-day, the Osmania University Library had taken up the digitization project in Jan 2005 under the umbrella of 'Digital Library of India'. Due to the insufficient trained manpower in the university library, the project has been outsourced to Trinaina Informatics Pvt Ltd, Hyderabad. They have provided 30 employees who are working

under this project including one project leader. In developing countries, efficient manpower is one of the genuine problems faced by most of the libraries. But in the case of Osmania University, manpower have been supplied by Trinainya Informatics Ltd, which is been supported by CMU and Govt. of India. Therefore, there is no dearth of regular manpower, which is allotted to provide regular services.

**Financial:** Financial problem is the main problem of any library in developing countries. Similar is the case of OU library. It has been seen that the budget allotted to library is either gradually decreasing or constant. Therefore, it failed to comply with the demand of increasing number of users and tremendous growth of publishing literature. But in the case of digital library project, the finance is not a problem. The digitization project of Osmania University is supported by Office of the Principal, Scientific Advisor, Government of India; Ministry of Communication and Information Technology, National Science Foundation (NSF) and Carnegie Mellon University (CMU). In true sense, the OU library has been facing a serious problem in continuing the existing foreign journals year after years. It has been found from the study that there is a sharp decline in the subscription of foreign journals. The project running cost can be estimated: Each employee average salary is Rs. 3000/- and Project Leader gets approx Rs. 6000/-. Therefore, monthly expenses for the salary of the staff is Rs.  $(30 \times 3000 + 6000) =$  Rs. 96,000 per month.

**Archives:** The fundamental challenge to all the libraries that is associated with the digital libraries is archiving the digital documents and its related issues. Archiving the documents in any form is one of the crucial tasks of any library and information center. With the influence of rapid changing technologies, it is a challenging task to the library for preserving the print as well as digital documents. At present, Osmania University is having digital library project to scan one-lakh books. Under agreement, it has been

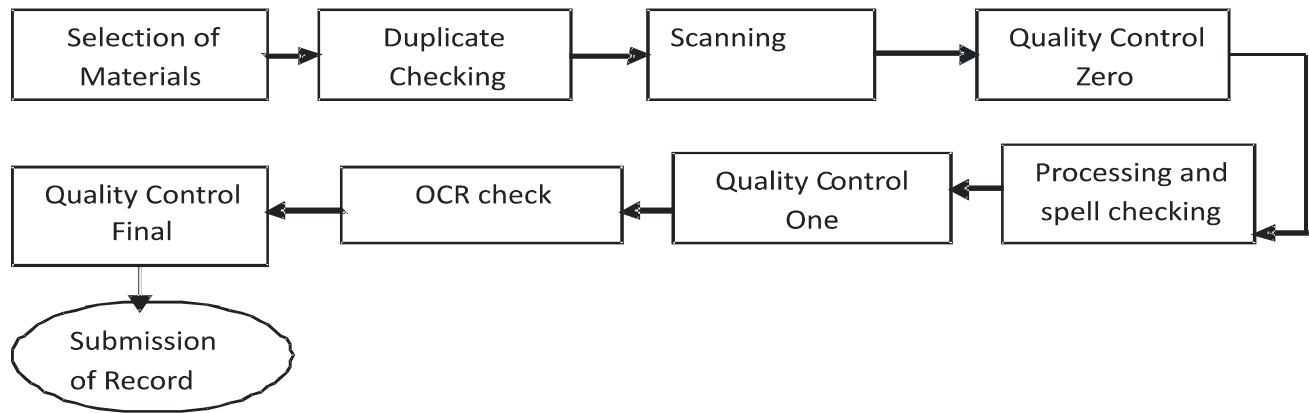
decided to hand over the digital copy of the book to IIIT, Hyderabad who uploads the document onto the DLI website i.e. <http://dli.iiit.ac.in/> . On the Other hand, OU Library used to archive the scanned document in the form of CD-ROM in order to provide access to the users through LAN. So far as e-journals are concerned, the archival problems are the same as others. There is no archival facility, instead there is only option is to provide access to the users as long as the university is subscribing them from publishers site. The archival is made by the publishers not by the subscribers.

**Copyrights:** The copyrights of intellectual assets are another crucial problem towards building the digital library. Before scanning the documents, it is required to take the permission from the authors to make it widely available. It's really a challenging task. All the books that are currently available online have either been checked against their copyright re-registration directory in which books prior to 1963, which are not re-registered are deemed to be out of copyright. However, in case of possible error in copyright checking, if the author or publisher sends a written request for removal to the webmaster, Regional Mega Scanning Center, IIIT, Hyderabad, then the documents can be withdrawn from the site.

**Acceptability:** Librarians and many users have not yet accepted the electronic media or the digital media to completely replace the print media. The readers are still comfortable to use print journals, magazines, books rather than e-journals, e-books. However, the research community is using and depending on the electronic sources especially Internet and digital library in order to get faster information and save time. Even computers with best resolution cannot match the print equivalent for reading.

**Quality Assurance:** There are three types of quality control process executed before final submission of the digitized pages to the Nodal center i. e IIIT, Hyderabad generally at the end of each month.

Fig. 2. Digital document editing and quality cycle



Therefore, it is a herculean task to check the quality of the digital document and spell checking. Since in the above cycle, it has been shown three stages of quality assurance, so there is a high chance of error-free digital document. It requires a lot of patience and attention of the employee.

**Infrastructure:** Regarding infrastructure hardly anyone thinks about until something goes wrong. It's the computer we rely on to provide information, news, scanning and distribution of resources over the network. It's sure that it is not possible to build a Digital Library without infrastructure. In simple terms, Infrastructure we mean the followings

1. **Server;**
2. Software and Hardware (server, storage device,, CD/DVD writers, Power Backup);
3. Clients (there are 29 client systems which are connected to the server);
4. Networks (clients are connected through LAN);
5. Building block with furniture and fixture;
6. High speed Internet connectivity.

**Building Digital Collections:** The most important component of digital library is the digital collection. A digital library can have a wide range of resources. It may contain both paper-based conventional documents or documents in digital form. It is a challenging task for the library professionals for building up the balanced digital collection in the library. The digital collection comprises of e-journals,

electronic databases (bibliographic and full-text), e-books, scholarly articles, manuals, downloaded materials from Internet, theses and dissertations, patents etc. Another important aspect of building digital collection is buying access to external digital resources (Arora, 2001). It's a real challenge for the libraries to build a real digital library. Majority of the collection is nothing but having access to the digital collection by the commercial publishers, scholarly societies. Most well-known commercial publishers of traditional journals such as Elsevier Science, Kluwer Academic Press, Academic Press, Springer, Wiley Inter Science, ACM, IEEE, IEE are making their publications available online through websites.

**Metadata:** Metadata is in simple terms data about data. Therefore, it is essential to assign metadata to each and every digitized document. But, It is essential to assign metadata to each scanned document for easy searching and retrieval. Generally, Dublin Core metadata element set is used for standardization. After final quality control check, metadata are used to assign against each document. Therefore, it is a challenging task for the employee to maintain the metadata for all documents.

**Image Processing:** Generally, the book consists of text, images and graphics. During the scanning it may happen sometimes that images did not appear prominent. In such a case, lot of editing works need to be done. The graphical level of each image was checked with the original and if there is any discrepancy then it is required to scan separately. It is also required sometimes to edit the image using Adobe Photoshop or



other photo editing software. The images were checked in terms of clarity, legibility, colour. The graphics level of each image was checked with the original. The images, which have come brighter, were toned down to match the actual. The unwanted stain mark worm marks were removed.

### **Findings, Discussion and Conclusion**

**Findings:** Following are some of the finding of the case study of the Osmania University Digital Library:

1. It has been found from the case study of Osmania University, Hyderabad that there exists a composite collection comprising of print documents as well as digital one. There are many users accessing thousands of full-text e-journals through INDEST consortium. Besides, the university has taken a keen initiative of digitizing the part of its collection under the supervision of DLI Projects

2. It has been noticed through the study that there is a decrease in 37 in the procurement of printed foreign journals whereas lot of foreign e-journals have been given access to the users.

3. Another findings is that although there is no clear-cut policy for developing composite collection (objective-2) regarding digitization there is an implied/ informal policy by which collection development is smoothly going on.

4. It is known fact that copyright is the real hurdle for undergone digitization. But, the OU Library does not have any policy constraint, manpower problem and copyright problem because the university and the Government of India are encouraged for digitization of records of knowledge that form the cultural heritage of the country because digitization is the best way of disseminating and preserving the cultural heritage of the country. The books under digitization are not coming under copyright issue because the university digitizes books, which are free from copyright.

### **Discussion**

Generally, as the nature and feature of collection development in university environment dramatically changed, the e-book (Jalal, 2001) and e-journals are dominating the gradually by increasing its share in budget. It has been found from the above study that

although e-resources has increased a lot but budget on print books procurement did not reduced proportionally. It may take some more years. Case & Jakubs (1999) argued the importance of international resources in today's environment and described some initiatives by the Association of Research Libraries (ARL) to improve global access to information.

### **Conclusion**

Atkinson (2003) recommended that the best way to restore the free flow of scholarly communication is for universities to take control of scholarly process. The present digital environment demands university libraries to participate actively in creation and management of digital resources and become digital publishers. Lynch (2003), former head of California Digital library sees 'institutional repositories' as containing a wide variety of information format: 'intellectual works of faculty and students' both research articles and teaching materials and documentation of the activities of the institutions and performances, ongoing research projects and its outcome. These are and can become the integral part of collection development for the universities. The Osmania University Central Library is really took an interest to develop the digital collection through Digital Library of India Project and giving access to e-resources to its users. Therefore, the users of the university are habituated to use more and more digital documents including e-resources. Besides, the rich cultural heritage and rare documents can be preserved and may be given access to users globally.

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