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# ICT Skills of LIS Professionals in Engineering Institutions of Orissa, India: A Case Study

Sunil Kumar Satpathy
*National Institute of Technology*, drsksatpathy@gmail.com

Rabindra K. Maharana
*C. V. Raman College of Engineering*, maharana.rabindra@gmail.com

# ICT Skills of LIS Professionals in Engineering Institutions of Orissa, India: A Case Study

Dr Sunil Kumar Satpathy
Deputy Librarian
National Institute of Technology
G. E. /Road, Raipur (C. G. )-492010, India

Rabindra K. Maharana
Asst. Librarian
C. V. Raman College of Engineering
Bidya Nagar, Mahua, Janla, Bhubaneswar, India

## Introduction

Over past few decades, the library environment has changed considerably in terms of collection, organization and services. The e-resources (both online and offline) have occupied a considerable space in the library collection, the transaction of library materials are fully automated, new web based services are offered by libraries to attract users participation in redesigning the library system and services and so on. These changes are mainly due to the development and impact of Information Communication Technology (ICT) in libraries which have also made sea changes in all walks of life. The ICT tools and services are being used in libraries to mange libraries more efficiently and to cater users demand properly. In this changing library scenario, the library and Information professionals must possess adequate ICT skills to manage the modern libraries, more specifically the academic libraries . They need to acquire continuous knowledge and skills on the fast changing Information Communication Technology to provide better library services to users.

The present study covers the library and Information Science (LIS) professionals of 76 Engineering Institutes of Orissa which are approved by All India Council of Technical Education (AICTE), New Delhi by the year 2009. Out of these 76 engineering institutes, 04 are government and 72 are self-financing institutes which offers B. Tech, M. Tech and Ph. D courses in engineering. The present study attempts to study the ICT skills of LIS professionals working in these institutes.

## Objectives of the Study

The objective is to make an analysis of the ICT skills of LIS professionals working in engineering colleges of Orissa. Other objectives of the study are:

a) To identify the types of ICT skills possessed by the LIS professionals working in engineering colleges of Orissa.

b) To find out the participation of LIS professionals in various ICT related activities.

c) To find out the application of ICT skill by LIS professionals in modernization of libraries.

d) Find out the constraints encounter by LIS professionals in acquiring ICT skills

## Scope and Limitations

The scope of the study encompasses the ICT skills of LIS professionals working in engineering colleges of Orissa. However the study has following limitations.

a) The study is limited to Orissa state only and not any other states of India.

b) The study includes only the engineering colleges (both Govt. and Self financed) of Orissa, which are affiliated under Biju Pattanik University of Technology (BPUT), Orissa and approved by AICTE by 2009.

c) The study covers only LIS professionals and not any other category of staff of these engineering colleges. Further among various aspects of LIS professionals, the study is limited to ICT skills only.

## Literature Review

Joint (2003) attempts to flesh out the heterogeneous skills required by LIS professionals by relating them to past and present practice, and sketches possible paths along which digital library training might evolve. Joseph (2003) identifies various level of IT literacy and discusses the perspectives of information literacy. Ashcroft and Watts (2005) highlight a significant skills gap amongst information professionals and suggests that collaboration and strategic management of resources may be key to alleviating this problem. Babu, et. al (2007) examine the ICT skills among librarians in engineering educational institutions in Tamil Nadu. Kavulya, (2007) identifies priority areas of training and critical IT skills required by LIS professionals in relation to current job market and performance requirements. Mahmood and Khan (2007) examines various factors such as the ICT-focused educational backgrounds of LIS practitioners in Pakistan, preferences of LIS professionals for ICT training including methods of CE, providers, incentives, suitable days/time, methods of announcement, payment, and language etc and the skills or techniques LIS professionals need to learn.

## Methodology

A structured questionnaire was designed and distributed to 152 LIS professionals under the scope of the study (02 LIS professionals of each engineering colleges). Out of this 152, only 113 respondents responded with filled in questionnaires (74. 3 %). Hence in all case the total number of respondents will be 113. To make the data analysis statistically sound, various statistical techniques such as percentage, arithmetic mean and weighted arithmetic mean have been used.

Classified data about the respondents

Respondents professional qualification, experience, designation also effects their professional skills and competencies to a great extent. The present study attemts to collect data on this which have been tabulated in Table 1

*Table1: Designation, professional qualifications, and experiences of respondents*

| Respondent by designation | No. of respondents | Percentage (%) |
| --- | --- | --- |

| | | |
|---|---|---|
| Sr. librarian | 02 | 1. 77 |
| Librarian | 65 | 57. 52 |
| Asst. Librarian | 46 | 40. 71 |
| Total | 113 | 100% |
| Professional Qualifications | | |
| Ph. D | 04 | 3. 54 |
| MPhill | 11 | 9. 73 |
| MLISC | 80 | 70. 80 |
| BLISC | 18 | 15. 93 |
| Total | 113 | 100% |
| Experience | | |
| 1- 5 years | 18 | 15. 93 |
| 5-10 years | 61 | 53. 98 |
| 10-15 years | 29 | 25. 66 |
| More than 15 years | 5 | 4. 43 |
| Total | 113 | 100% |

The analysis of Table1 depicts that regarding designation of respondents,, 02 have Sr. Librarian (1. 77%), 65 have Librarian (57. 52%) and 46 have Asst. Librarian designation (40. 71%). Regarding professional qualification of respondents, as high as 80 respondents out of 133 (70. 80%) have MLIS qualification, followed by BLIS qualification (15. 93%), M. Phil qualification (9. 73%) and Ph. D qualification (3. 54%). Similarly, regarding working experience of respondents, 61 respondents out of 133 have 5-10 years of experience (53. 98%). It is followed by working experience of 10-15 years, 1-5 years and more than 15 years representing 25. 66%, 15. 93% and 4. 43% respectively.

Knowledge of Computers and Related Tools

The analysis of data revels that all respondents are computer literate and have sound knowledge on the various ICT tools available in libraries.

Knowledge of Operating System

Knowledge on operating system is the primary requisite to handle computer systems which is the basic ICT tools available in libraries. In the present study, respondents were asked to give their opinion on three popular operating systems

and data collected on this are tabulated in Table 2 . It shows that a majority of the library professionals are well conversant with MS- Windows followed by MS-DOS and Linux as per the weighted arithmetic mean (WAM) values 39. 2, 32. 3, and 26. 3 respectively.

*Table 2: Knowledge of operating system*

| Level of knowledge | Not known | Partially known | Known | Fully known | Weighted arithmetic mean | Rank |
|---|---|---|---|---|---|---|
| MS- DOS | -- | 35 (30. 97) | 59 (52. 21) | 19 (16. 82) | 32. 3 | 2 |
| MS- Window | -- | 15 (13. 27) | 30 (26. 55) | 68 (60. 18) | 39. 2 | 1 |
| Linux | 33 (29. 2) | 22 (19. 47) | 46 (40. 71) | 12 (10. 62) | 26. 3 | 3 |

*Note: Figures in parenthesis denote percentage.*

Knowledge of programming languages

Now a days programming languages have become essential for webpage design, managing open source software etc. Realizing its importance, data were collected on this and has been tabulated in Table3.

*Table 3: Knowledge of programming languages*

| Programming language | Excellent | Good | Average | Poor | Weighted arithmetic mean | Rank |
|---|---|---|---|---|---|---|
| C++ | 23 (20. 36) | 45 (39. 82) | 32 (28. 32) | 13 (11. 5) | 30. 4 | 2 |
| HTML | 22 (19. 47) | 57 (50. 44) | 28 (24. 78) | 6 (5. 31) | 32. 1 | 1 |
| XML | 9 (7. 96) | 33 (29. 2) | 51 (45. 13) | 20 (17. 71) | 25. 7 | 3 |
| Java | 5 (4. 42) | 33 (29. 2) | 47 (41. 6) | 28 (24. 78) | 24. 1 | 4 |

*Note: Figures in parenthesis denote percentage.*

The analysis of data reveals that majority of the LIS professionals have knowledge of HTML, followed by C++, XML and Java which is also evident from the value of weighted arithmetic mean.

Library automation has become the bare necessity for each and every library; hence all LIS professionals need to have basic knowledge of library automation. The present study collected data on this which has been tabulated in Table4.

*Table4: knowledge of library automation*

|  |  |  |  |
|---|---|---|---|

| Response | # of Respondents | Percentage (%) |
|----------|-----------------|----------------|
| Yes | 103 | 91. 15 |
| No | 10 | 8. 85 |
| Total | 113 | 100 |

The analysis of data reveals that our of 113 respondents, 103 (91. 15%) have knowledge of library automation where as 10 respondents (8. 85%) do not have this knowledge. Further data were collected on the level of knowledge of various library automation software by the LIS professionals which has been tabulated as follows.

Table 5: knowledge of library automation software

| Lib automation software | Excellent | Good | Average | Poor | Weighted arithmetic mean | Rank |
|-------------------------|-----------|------|---------|------|--------------------------|------|
| CDS/ ISIS | 55 (53. 4) | 37 (35. 92) | 11 (10. 68) | -- | 35. 3 | 2 |
| LibSys | 64 (62. 13) | 33 (32. 04) | 6 (5. 83) | -- | 36. 7 | 1 |
| E-Granthalaya | 28 (27. 18) | 30 (29. 13) | 35 (33. 98) | 10 (9. 71) | 28. 2 | 3 |
| SOUL | 16 (15. 53) | 28 (27. 18) | 34 (33. 01) | 25 (24. 28) | 24. 1 | 4 |
| Open source software | 10 (9. 71) | 24 (23. 3) | 38 (36. 89) | 31 (30. 1) | 21. 9 | 5 |

*Note: Figures in parenthesis denote percentage.*

The analysis of data of Table5 shows that out of 103 respondents, who possess knowledge of library automation, maximum number of respondents have knowledge of LibSys automation software, followed by CDS/ISIS, E-Granthalaya, SOUL and other open source library automation software .

Table 6: Application of knowledge in automating the library

| Response | # of Respondents | Percentage (%) |
|----------|-----------------|----------------|
| Yes | 43 | 38. 05 |
| No | 70 | 61. 95 |
| Total | 113 | 100 |

It is surprising to know form the analysis of data of Table6 that in spite of

knowledge of Library automation, only 43 professionals out of 113 (38. 05%) have been able to apply their knowledge in automating their library where as nearly double of this i. e. 70 respondents (61. 95%) have not been able to apply their knowledge.

Data were collected in the present study to know about the stages of library automation and has been tabulated in Table7. It shows that maximum number of respondents i. e. 70 out of 113 (61. 95%) opined that library automation has not been started in their library where as 22 respondents opined that library automation is at beginning stage (19. 47%), followed by 15 partially automated (13. 27%) and 6 fully automated (5. 31%).

*Table 7: Stage of library automation*

| Stages of automation | # of Respondents | Percentage (%) |
|---|---|---|
| Fully automated | 6 | 5. 31 |
| Partially automated | 15 | 13. 27 |
| Beginning stage | 22 | 19. 47 |
| Not started | 70 | 61. 95 |
| Total | 113 | 100 |

Digital library and Institutional repositories have become the latest ICT tools of libraries. The study attempts to collect data on this latest ICT tools which is tabulated in Table8. The analysis of data shows that as high as 96 respondents out of 113 (84. 96%) have knowledge of this where as 17 respondents (15. 04%) do not have.

*Table 8: knowledge of Digital library/ Institutional repository*

| Response | # of Respondents | Percentage (%) |
|---|---|---|
| Yes | 96 | 84. 96 |
| No | 17 | 15. 04 |
| Total | 113 | 100 |

Further attempt was made in the study to know about the level of knowledge of LIS professionals on various Digital Library (DL)/Institutional Repository (IR) software and data collected on this have been tabulated in Table9.

*Table 9: Knowledge of digital library/Institutional repositories software*

| Dig. lib. software | Excellent | Good | Average | Poor | Weighted arithmetic mean | Rank |
|---|---|---|---|---|---|---|
| GSDL | 8 (8. 33) | 26 (27. 08) | 52 (54. 17) | 10 (10. 42) | 22. 4 | 1 |
| | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DSpace | 8 (8. 33) | 21 (21. 88) | 26 (27. 08) | 41 (42. 71) | 18. 8 | | 3 |
| E-Print | 2 (2. 08) | 8 (8. 33) | 25 (26. 04) | 61 (63. 55) | 14. 3 | | 4 |
| NewGen Lib | 10 (10. 41) | 22 (22. 92) | 28 (29. 17) | 36 (37. 5) | 19. 8 | | 2 |

*Note: Figures in parenthesis denote percentage.*

It is evident form the analysis of data of Table9 that, out of 96 respondents who posses the knowledge of digital library/institutional repositories software, maximum professionals have knowledge of GSDL, followed by NewGen Lib, DSpace and E-print.

*Table 10: Application of DL/IR knowledge in library*

| Response | # of Respondents | Percentage (%) |
|---|---|---|
| Yes | 05 | 4. 42 |
| No | 108 | 95. 58 |
| Total | 113 | 100 |

It is surprising to note from the analysis of data of Table10 that even though a good number of LIS professionals possess knowledge of DL/IR, only 05 respondents (4. 42%) opined that they have applied this knowledge in library where as 108 respondents (95. 58%) opined negatively. Also in all libraries the DL/IR are in beginning stage.

Knowledge of Web-based service

With the development of Web 1. 0 and its evolution to Web 2. 0 and 3. 0, many web based services have been introduced in libraries to provide better services to users. Realizing its importance, the study attempts to assess the knowledge of LIS professionals on this and the collected data have been tabulated in Table11.

*Table 11: knowledge of Web-based service*

| Web based service | Excellent | Good | Average | Poor | Weighted arithmetic mean | Rank |
|---|---|---|---|---|---|---|
| E-mail | 88 (77. 88) | 23 (20. 35) | 2 (1. 77) | -- | 42. 5 | 1 |
| Chatting | 84 (74. 34) | 21 (18. 58) | 8 (7. 08) | -- | 41. 5 | 2 |
| Search engines | 63 (55. 75) | 24 (21. 24) | 19 (16. 81) | 7 (6. 2) | 36. 9 | 4 |
| e-resources search | 59 (52. 21) | 34 (30. 09) | 16 (14. 16) | 4 (3. 54) | 37. 4 | 3 |

| | Excellent | Good | Average | Poor | | Rank |
|---|---|---|---|---|---|---|
| Use of OPAC/ Web OPAC | 57 (50. 44) | 30 (26. 55) | 17 (15. 04) | 9 (7. 97) | 36. 1 | 5 |
| Webpage design | 10 (8. 85) | 37 (32. 74) | 48 (42. 48) | 18 (15. 93) | 26. 5 | 6 |

The analysis of data reveals that most of the professionals possess knowledge of e-mail, followed by charting, e-resource search, search engines, search engines, use of OPAC/Web OPAC and web design. It is also evident from the weighted arithmetic mean value.

Participation in ICT tools

With the development of ICT, various tools have been developed in libraries to build a close relationship with users and redesign library services according to the need of users. Also through this participation they keep themselves update with the new developments in libraries . The analysis of data of Table 12 shows that LIS professionals actively participates in web based professional forums, followed by participation in mailing list, social networking, blogging and instant messaging, which is also evident from the weighted arithmetic mean value.

*Table12: Participation in ICT tools*

| Participation | Excellent | Good | Average | Poor | Weighted arithmetic mean | Rank |
|---|---|---|---|---|---|---|
| Social Networking (Orkut, Facebook etc. ) | 49 (43. 37) | 33 (29. 2) | 19 (16. 81) | 12 (10. 62) | 34. 5 | 3 |
| Web based Professional forum | 69 (61. 06) | 35 (30. 97) | 9 (7. 97) | -- | 39. 9 | 1 |
| Mailing list | 62 (54. 87) | 38 (33. 63) | 13 (11. 5) | -- | 38. 8 | 2 |
| Instant messaging | 30 (26. 55) | 36 (31. 86) | 29 (25. 66) | 18 (15. 93) | 30. 4 | 5 |
| Blogging | 36 (31. 86) | 50 (44. 25) | 16 (14. 16) | 11 (9. 73) | 33. 7 | 4 |

Purpose of using ICT tools

The purpose of using ICT tools varies from persons to persons. The study attempts to collect data on this which have been tabulated in Table13

*Table 13: Purpose of using ICT tools*

| Purpose | No. of responses | Per cent |
|---|---|---|
| Communication | 113 | 100 |
| Study & research | 79 | 69. 92 |
| | | |

| | | |
|---|---|---|
| Providing information service | 96 | 84. 96 |
| Entertainment | 53 | 46. 9 |
| Other | 36 | 31. 86 |

As per the analysis of data of Table13, the main purpose of using ICT tools by professionals is communication as all 113 respondents opined on this (100%). It is followed by other purposes such as providing information services, study & research, entertainment and other having response rate of 96 (84. 96%), 79 (69. 92%), 53 (46. 9%) and 36 (31. 86%) respectively.

Means & methods of acquiring ICT skills

There are various methods of acquiring ICT skills by the professionals and data collected on this in the present study have been tabulated in Table14.

*Table 14: Methods of acquiring ICT skills*

| Methods | No. of responses | % |
|---|---|---|
| Formal education/ training | 88 | 77. 88 |
| Informal education/ training | 56 | 49. 56 |
| From colleagues/ friends | 66 | 58. 41 |
| Trail & error basis | 69 | 61. 07 |
| Self study | 21 | 18. 59 |

As per the analysis of data of Table14, as high as 88 responses (77. 88%) indicates that the primary method of acquiring ICT skills by professionals is formal education/training. It is followed by other methods such as trail & error basis (61. 07%), from colleagues/friends (58. 41%), informal education/training (49. 56%)

Constraints in acquiring ICT skills

Data have been collected on the constraints faced by LIS professionals in acquiring ICT skills and have been tabulated as follows.

*Table 15: Constraints in acquiring ICT skills*

| Constraints | No. of responses | % |
|---|---|---|
| Tight working schedule | 108 | 95. 58 |
| Poor infrastructural facilities | 99 | 87. 62 |
| Lack of cooperation from the authority | 97 | 85. 85 |
| Poor in service training provision | 103 | 91. 16 |
| Personal inabilities | 33 | 29. 21 |

The analysis of data of Table15 shows that the main constraint in acquiring ICT skills by LIS professionals is tight working schedule as 108 respondents out of 113 have responded to this (95. 58%). It is followed by other responses such as poor in-service training provision (91. 16%), poor infrastructural facilities of the library (87. 62%), lack of cooperation from the authority (85. 85%) and personal inabilities (29. 21%).

## Findings

The findings of the present study are summarized as follows.

- Maximum LIS professionals working in engineering colleges of Orissa have Master degree in LIS and the engineering colleges libraries are headed by Librarian.
- All LIS professionals are computer literate and have sound knowledge of the available ICT tools in libraries
- Ms-window is the most popular operating system and HTML is the most popular programming language used by the professionals in libraries.
- Most of the professionals have knowledge of library automation and maximum professionals possess knowledge of LibSys automation software.
- In spite of good knowledge of library automation and automation software by professionals, nearly 30% have able to apply their knowledge in automating their libraries . Further, very few libraries are completely automated and most libraries are in beginning stage.
- A good number of professionals also possess knowledge of digital library and institutional repositories. GSDL is the software on which maximum professional posses knowledge but very few professionals have been able to apply their knowledge in developing digital libraries. Also the concept of digital library and institutional repositories are in budding stage in engineering colleges.
- The knowledge of web based services such as e-mail, charting, e-resources search, knowledge of OPAC/Web OPAC, web page designing, search engine etc by professionals is quite encouraging.
- The professionals also actively participate in various ICT related activities like professional forums, mailing list, social networking, blogging etc.
- The primary purpose of using ICT tools by professionals is communication i. e. to serve library users in a better way. Further formal education and training is the main method of acquiring ICT skills by them.
- The main constraints faced by professionals in acquiring ICT skill is the tight working schedule of the libraries, poor infrastructural facilities and lack of cooperation from authorities.

## Conclusion

Revolutionary changes have been occurred during past few decades in library environment as a result of the advances in Information Communication Technology (ICT). Such remarkable changes demands new roles for LIS professionals from custodian of books to information manager and more recently knowledge manager. The LIS professionals must possess sufficient knowledge of new ICT skills such as library automation, e-resources management, content management, organization of information on Internet and Intranet, developing and maintaining digital libraries/institutional repositories, web based library services etc.

The present study reveals that the LIS professionals working in various engineering institutions of Orissa are mostly computer literate and have acquired considerable basic ICT skills to manage the library . But still there are enough scope to enhance their ICT skills and to implement these skills in libraries to provide new ICT based library services to users. Some suggestions have been

made below for the improvement of ICT skills of LIS professionals

- The library authorities need to provide necessary scope and motivation to upgrade the ICT skills of LIS professionals.
- The engineering institutes need to develop the infrastructural facilities of their libraries so that the ICT skills of LIS professionals can be best used.
- The library schools of Orissa need to change their curricula focusing more on ICT and changing library environment.
- The LIS professionals associations, Biju Pattnaik University of Technology, Orissa and AICTE need to organize various training programs for LIS professionals to enhance their ICT skills.

ICT influences the role of LIS professionals and offers a number of opportunities for professional and personal development. Professionals with right ICT skills and expertise will have ample opportunities in future and will be crucial to the management of technology intensive libraries.

## References

Ashcroft, L., & Watts, C. (2005). ICT Skills for Information Professionals in Developing Countries: perspectives from a study of the electronic information environment in Nigeria *IFLA Journal* 31 (1 ):6-11.

Babu, B.R., Vinayagamoorthy, P., & Gopalakrishnan, S. (2007). *DESIDOC Bulletin of Information Technology* 27 (6):55-64.

Kavulya, J.M. (2007). Training of library and information science (LIS) professionals in Kenya: A needs assessment. *Library Review* 56 (3):208 – 223. DOI: 10. 1108/00242530710735993.

Mahmood, K., & Khan, M. A. (2007). ICT training for LIS professionals in Pakistan: A needs assessment. *Program: Electronic Library and Information Systems* 41 (4): 418 – 427. DOI: 10. 1108/00330330710831611.

Joint, N. (2003). Staff development and training in the digital library environment. *Library Review* 52 (9):417 – 421. DOI: 10. 1108/00242530310501428 .

Introduction. Â  selected for promotion of India Studies by foreign students. The Kerala University Library (KUL), established in 1942, is the oldest and biggest university library in Kerala and is situated adjacent to the University Senate Hall campus in the Thiruvananthapuram city. Â Satapthy and Maharana11 studied the ICT skills of LIS professionals in engineering institutions of Orissa. Maximum number of respondents have knowledge of LibSys automation software (62.13%). The analysis also revealed that the most of the professionals possess knowledge of e-mail, followed by e-resource, search engines and use of OPAC. Information and communications technology (ICT) professionals 1 conduct research, plan, design, write, test, provide advice and improve information technology systems, hardware, software and related concepts for specific applications. Â As ICT professionals very often come from non-pure IT studies, enriching curricula across specialisation of studies with STEM and other ICT-pertinent skills can support people's transition to ICT professional jobs, regardless of their educational background. Â Certifications are designed to keep the knowledge and skills of the workforce updated. The e-skills QUALITY study 16 shows that certification has become essential for ICT practitioners across all backgrounds. ICT skills of LIS professionals in engineering institutions of Orissa, India: a case study, Library Philosophy and Practice , Available at http://digitalcommons.unl. edu/libphilprac/627 (Accessed on 26 Jun 2013). [6] Kumar, K. (2013). Knowledge on ICT skills among LIS professionals of engineering institutions of Andhra Pradesh State: a survey, DESIDOC Journal of Library & Information Technology, 33(6), 480-487. www.ijhssi.org. 17 | Page. A study on neurophysiology virtual labs suggested employing ICT-based skill training complemented as a cost-effective methodology for enhancing neuroscience education especially, in financially and geographically challenged nations like India (Diwakar et al. 2014). Remote labs have also been assessed as a self-learning material for robotic education (Vijayan et al. Â Laboratory exercises in STEM (Science, Technology, Engineering, and Mathematics) areas often require effective skill acquisition and hands-on roles for sustained skill training. Information and communications technology (ICT) skills refer to one's ability to converse with people through various technologies. Similar to information technology (IT), ICT refers to technology use for regular, everyday tasks: sending an email, making a video call, searching the internet, using a tablet or mobile phone, and more. ICT skills could also include the ability to use older communication technologies such as telephones, radios, and televisions. Typically, ICT experts are called upon to integrate old communication technology with the new technology. Almost every job requires some ICT skills, and many require hybrid skills, a skill set that is a mix of technical and non-technical skills. Types of ICT Skills. Email Management and Setup.