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Knowledge and utilization of ICT and open source softwares among the library professionals of Karnataka: A case study

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Abstract

The purpose of this study is to investigate the information and communication technology proficiency of the library professionals at the Karnataka state as well as to find out their software development, system analysis, and design skills. The study is based on a questionnaire survey of library professionals in Karnataka state. The analyses revealed that the library professionals in Karnataka have relatively average level skills in various ICT related tasks in libraries. Koha open source software was more used in libraries and a good number of professionals indicated that the main constraint in the application of ICT in libraries is inadequate training in ICT applications. All the professionals expressed a positive attitude towards the application of ICT in libraries.

Keywords: Information and communication technologies (ICT), library professionals, digital library, library automation, content management system, learning management system

1. Introduction

Information and Communication Technology (ICT) is a term that has various meanings. ICT refers to technology that provides access to information through telecommunications. Information and communication technology (ICT) has changed the landscape of libraries and librarianship. Libraries are being transitioned from the four walls to the cyber environment. Library resources are being transformed from print to digital and web resources. Information has been disseminated speedily around the globe due to advanced means of telecommunication. Therefore, it is being used extensively and has resulted in tremendous growth of information. The growing ICT-driven information services have posed challenges to library and information professionals.

In the early seventies library automation processes were started to automate and smoothen the workflow of the library services. In the late nineties, Internet changed this automation process with the emergence of web based services. In the last 8-10 years, the web 2.0 has revolutionized information communication by faster information sharing, networking, and enablingmultimedia services. The evolution of social network and social sharing has forced libraries to adopt this technology in their routine services to meet user's expectations and achieve immediate information delivery. Information professionals are now expected to be aware and capable of using and demonstrating emerging ICTs. Application of ICT is posing a particular challenge to library professionals in developing countries. There is need for additional training to augment the traditional skills so as to develop competency in ICT use. These issues make it necessary to study the ICT skills needed for the information professionals in this changing scenario. Here an attempt has made to assess the Information and Communication Technology (ICT) skills among library professionals in the Karnataka state [1].

2. Objectives of the Study

➢ To investigate the proficiency of ICT skills of library professionals in the Karnataka state.
➢ To identify the constraints in acquiring ICT skills by library professionals. and
➢ To find out the participation of professionals in various ICT related Activities.

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> To suggest the measures for the improvement of ICT skill development and ICT enabled services.

3. Review of literature

S T Seena and K G Sudhier Pilla (2014) [1]. This study revealed that most of the ICT technologies which are taken for this study are not yet been introduced in the Kerala University library system. Therefore the library professionals are not in a position to use these technologies in their work. This will create a low level of technological skill development among the professionals working in this library system. The study concludes that the university library needs proper ICT infrastructure and training to the professionals in using the digital resources effectively.

Thanuskodi S, (2011) [2]. This study revealed Library Professionals with right ICT skills and expertise will have plenty opportunities in future and will be crucial to the management of technology intensive libraryes.

Haneefa M K and Shukkoor C K A, (2010) [3]. The findings of the study show that the young Professional Assistants are more ICT literates than the Junior Librarians and Assistant Librarians. Though the library professionals claim that they use different ICT based resources and services, the frequency of use of these resources and services was very low. The ICT literacy levels of the professionals were much influenced by the levels of ICT use in their libraries. The library professionals need to enhance their level of ICT literacy. The University should provide state-of-the-art ICT infrastructure including hardware, software and eresources with full-fledged Internet access. The library professionals should be provided with more chances of formal training to introduce all possible ICT-based resources and services that can improve their ICT literacy.

Kattimani S F and Naik R R, (2013) [4]. This survey, Program. it is recommended to management of the engineering colleges to depute their library professionals to suitable ICT-based training courses periodically, that is at least once in a year. It is essential to the library professionals to go for training in learning of advanced ICT skills and techniques.

Kumar K, (2013) [5]. The present survey reveals that the LIS professionals serving in various engineering educational institutions of the Rayalaseema Region of Andhra Pradesh are mostly computer literate and have significant basic ICT skills to handle the library, still there is enough scope to develop their innovative ICT skills and to implement these skills in the library to provide new ICT-based library services.

4. Methodology

The study is based on online questionnaire survey to collect data. The targeted population was the library and information professionals working at different institutions of Karnataka state which are owned either by the government or the private sector. Altogether, a structured questionnaire was designed to collect data keeping in mind the basic objectives of the study. The questionnaire consists of both optional type questions and statements in five point Lickert scale. The collected data was analyzed using latest version of MS-Excel for appropriate statistical analysis and description.

The study includes the library professionals of the Karnataka state. Out of 156 questionnaires, 118 responses were received. The study is confined to the library professional only. The data collected through the questionnaires was scrutinized, classified, and tabulated for better understanding and clarity. The collected data were entered into Microsoft Excel spread sheet for further analysis. The first part of the questionnaire is structured to get information of variables like gender, qualification, designation, experience, etc.

5. Analysis

Table 1: Gender-wise distribution of respondents

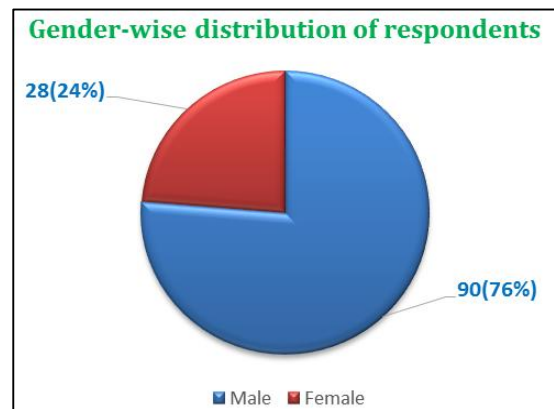| Sl. No	Gender	No of Respondents	%
1.	Male	90	76.27%
2.	Female	28	23.72%
Total		118	100%

Fig 1

Table 1 shows that numerically males are dominating library and information profession in the Karnataka State with the figure males 90 (76.27%) and 28 (39.22%) are females.

Table 2: Basic qualification of respondents

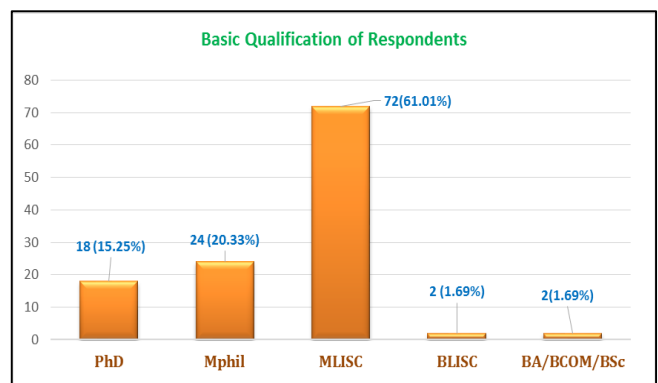| Sl. No	Qualification	No of Respondents	%
1	PhD	18	15.25%
2	Mphil	24	20.33%
3	MLISC	72	61.01%
4	BLISC	2	1.69%
5	BA/BCOM/BSc	2	1.69%
Total		118	100%

Fig 2

Table 2 reveals the respondents professional qualification. It was found that 72 (61.01%) of the respondents are having Post Graduate degree and 24 (20.33%) acquired M.Phil qualification in LIS. Whereas 18 (15.25%) respondents have doctoral degree in Library and Information Science.

Table 3: Region wise SLET/NET/JRF Qualifications of Respondents

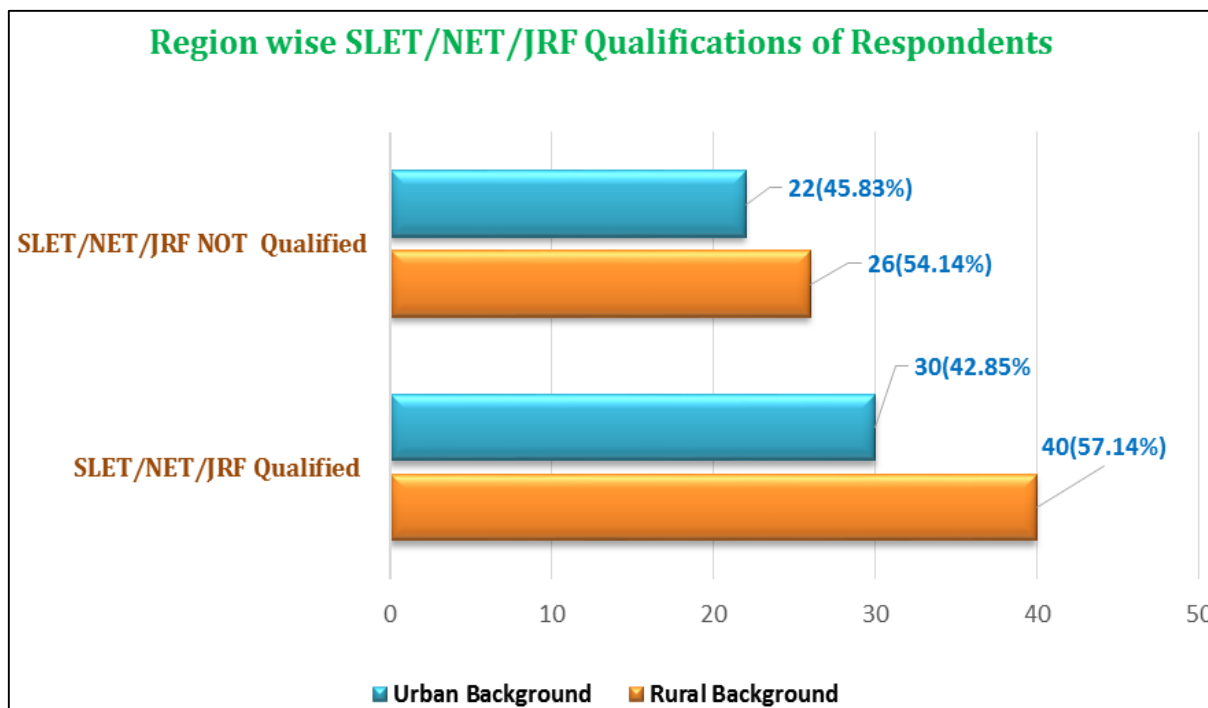| Sl. No	Societal Background	SLET/NET/JRF Qualified	SLET/NET/JRF NOT Qualified	Total No of Respondents
1	Rural Background	40 (57.14)	26 (54.14)	66 (55.93%)
2	Urban Background	30 (42.85)	22 (45.83)	52 (44.06%)
	Total	70 (100%)	48 (100%)	118 (100%)

Fig 3

Table 3 elaborates the region wise SLET/NET/JRF Qualification of library professionals. Overall 70 respondents out of 118 respondents have cleared SLET/NET/JRF. It is also cleared that respondents from rural background are at the success end with 57.14% of SLET/NET/JRF qualified. Respondents from the urban background at the looser end with 42.85 % clearing rate. It notable thing that there is 14.29% of difference in between the rural and urban backgrounds with respect to passing or clearing in the SLET/NET/JRF examination.

Table 4: Designation of respondents

Sl. No	Designation	No of respondents	%
1	Librarian	42	35.59%
2	Deputy Librarian	0	0
3	Assistant Librarian	50	42.37%
4	Library Assistant	10	8.47%
5	Library Attender	0	0
6	Other	16	13.55%
	Total	118	100

Table 4 gives the clear picture about the respondent's designation wise positions at their respective working organizations. Assistant Librarians stands first with 42.37% response rate, Librarian stands second with 35.59% response rate, whereas the survey failed to counter the Deputy Librarians and Library attenders in getting the response for the used questionnaire.

Table 5: Professional experience of respondents

Sl. No	Experience	No. of respondents	%
1	1 to 5 years	52	(44.06%)
2	6 to 10 years	30	(25.42%)
3	11 to 20 years	28	(23.72%)
4	Above 21 years	8	(6.77%)
	Total	118	(100%)

Table 5 presents the overall experience of the library professionals. Out of 118 respondents 52 (44.06%) professionals have experience ranging 1- 5 years and 30(25.42 %) professionals have 6 -10 years of experience. And 28(23.72%) professionals have 11 to 20 years, and only 8 (6.77%) Professionals have more than 21 years of Experience.

Table 6: Awareness of ICT Based Applications

Sl. No	ICT Based applications	Extremely poor (1)	Below average (2)	Average (3)	Above Average (4)	Excellent (5)	Total	Mean
1	Operating system Windows	0(0%)	10(8.47%)	52(44.06%)	31(26.27%)	25(21.18%)	118(100%)	3.61
2	Operating system Linux	2(1.69%)	18(15.25%)	48(40.67%)	26(22.03%)	24(20.33%)	118(100%)	3.44
3	MS office package	0(0%)	0(0%)	42(35.59%)	54(45.76%)	22(18.64%)	118(100%)	3.83
4	Photoshop	0(0%)	5(4.23%)	58(49.15%)	42(35.59%)	13(11.01%)	118(100%)	3.54
5	Web page design	15(12.7%)	30(25.42%)	44(37.28%)	24(20.33%)	5(4.23%)	118(100%)	2.77
6	Create metadata /tag	0(0%)	20(16.94%)	54(45.76%0	38(32.20%)	6(5.08%)	118(100%)	3.25
7	Installation and Customization of Software	25(21.1%)	28(23.7%)	36(30.5%)	21(17.79%)	8(6.77%)	118(100%)	2.66
8	Database Management System	30(25.4%)	32(27.1%)	22(18.64%)	15(12.71%)	19(16.10%)	118(100%)	2.67
9	RFID Technology	52(44%)	32(27.1%)	20(16.9%)	08(6.77%)	06(5.08%)	118(100%)	2.016
10	Barcode Technology	50(42.3%)	35(29.6%)	19(16.10%)	08(6.77%)	06(5.08%)	118(100%0	2.025

Table 6reveals that the respondents' level of knowledge with respect to ICT based applications. It is evident that respondents are highly familiari.e above average with the MS office packages with the mean value 3.83 and the windows operating system with mean value of 3.61. Interestingly many respondents are familiar with the Photoshop image editing/ manipulation software with the mean value of 3.54. However RFID technology and barcode technology are the poor areas of ICT which are yet to be explored to the library and information professionals. Both are at the mean value 2.016 and 2.025 respectively.

Table 6: Awareness of open source Operating System

Sl. No	Op. System	Extremely poor	Below average	Average	Above Average	Excellent	Total	Mean
1	Ubuntu	40(33.89%)	43(36.44%)	21(17.79%)	9(7.62%)	5(4.23%)	118(100%)	2.11
2	Open suse	51(43.22%)	38(32.20%)	24(20.33%)	5(4.23%)	0(0.00%)	118(100%)	1.85
3	Cent OS	51(43.22%)	40(33.89%)	20(16.94%)	5(4.23%)	2(1.69%)	118(100%)	1.87
5	Boss	54(45.76%)	35(29.66%)	20(16.94%)	5(4.23%)	4(3.38%)	118(100%)	1.89
6	Fedora	53(44.91%)	38(32.20%)	22(18.64%)	4(3.38%)	1(0.84%)	118(100%)	1.83
7	Linux Mint	56(47.45%)	40(33.89%)	19(16.10%)	3(2.54%)	0(0%)	118(100%)	1.74

Today almost all open source library automation, digitization, content management, learning management systems are flattering towards open source operating systems. Having sufficient awareness and knowledge of such open source operating system is need of the hour. Table 6 gives the picture of awareness of respondents towards the open source operating systems. Mean valu 2.11 clarifies that Debian based Ubuntu Linux operating system is a popular OS among the respondents. Whereas Linux Mint gained less popularity with the mean value 1.74 among the LIS respondents.

Table 7: Awareness of Open Source Library Management Systems

Sl. No	LMS	Extremely poor	Below average	Average	Above Average	Excellent	Total	Mean
1	Koha	3(2.54%)	7(5.93)	30(25.42%)	42(35.59%)	36(30.50)	118(100%)	3.85
2	ABCD	38(32.20%)	32(27.11%)	37(31.35%)	9(7.62%)	2(1.69%)	118(100%)	2.20
3	PMB	42(35.59%)	47(39.83%)	28(23.72%)	1(0.84%)	0(0%)	118(100%)	1.90
4	New Gen Lib	2(1.69%)	5(4.23%)	36(30.50%)	40(33.89%)	35(29.66%)	118(100%)	3.85
5	Open Biblio	30(25.42%)	43(36.44%)	27(22.88%)	13(11.01%)	5(4.23%)	118(100%)	2.32
6	Evergreen	24(20.33%)	38(^32.20%)	40(33.89%)	10(8.47%)	6(5.08%)	118(100%)	2.21
7	Phpmy Library	44(37.28%)	46(38.98%)	24(20.33%)	4(3.38%)	0(0%)	118(100%)	1.90

Open source software has brought tremendous change in the field of information technology in general and library and information services in particular. Management of routine work in the library is really a challenging task, Library Management Systems have come up as grate solution for the challenge. Open Source Library Management Systems are like oases in the aspect of financial crises of library and information centers. Table 7 give the bird's eye view about the knowledge of library professionals towards some popular OSLMS, Koha and New Gen Lib are the very familiar OSLMS among the respondents which are stands at "Above Average" level of awareness with the mean value 3.85. Php My library and PMB are at the "Below Average" level of awareness among the respondents with the mean value 1.90.

Table 8: Knowledge of Open Source Digital Library Software

Sl. No	IRS	Extremely poor	Below average	Average	Above Average	Excellent	Total	Mean
1	D Space	8 (6.77%)	10(8.47%)	32(27.11%)	38(32.20%)	30(25.42%)	118(100%)	3.61
2	E-Prints	8(6.77%)	12(10.16%)	40(33.89%)	32(27.11%)	26(22.03%)	118(100%)	3.47
3	Greenstone	6(5.084%)	16(13.55%)	38(32.20%)	36(30.50%)	22(18.64%)	118(100%)	2.50
4	OPUS	32(27.11)	35(29.66%)	42(35.59%)	9(7.62%)	0	118(100%)	2.23
5	Digital Commons	30(25.42%)	38(32.20%)	43(36.44%)	5(4.23%)	2(1.69%)	118(100%)	2.16
6	CONTENT dm	29(24.57%)	34(28.81%)	37(31.35%)	12(10.16%)	6(5.08%)	118(100%)	2.17
7	dLibra	32(27.11%)	48(40.67%)	30(25.42%)	6(5.08%)	2(1.69%)	118(100%)	2.05

Open source Digital Library or Institutional Repository software are becoming backbone or Library and Information Centers with respect to archiving and preserving of rare materials. Table 8 reveals that the knowledge of respondents towards the institutional repository or digital library software. 30 (25.42%) respondents responded that they have excellent knowledge about the Dspace software which has the highest mean value 3.61. E-prints stands at second rank with the mean value 3.47 and 26 respondents responded they have excellent knowledge about the e-prints. Whereas the knowledge of respondents about the dLibra is low with the mean value 2.05.

Table 9: Knowledge of Content Management Software

Sl. No	CMS	Extremely poor	Below average	Average	Above Average	Excellent	Total	Mean
1	Joomla	38(32.20%)	32(27.11%)	36(30.20%)	8(6.77%)	4(3.38%)	118(100%)	2.05
2	Wordpress	28(23.72%)	35(29.66%)	42(35.59%)	10(8.47%)	3(2.54%)	118(100%)	2.23
3	Drupal	36(30.20%)	34(28.81%)	38(32.20%)	6(5.08%)	4(3.38%)	118(100%)	2.05
4	CushyCMS	44(37.28%)	32(27.11%)	36(30.20%)	4(3.38%)	2(1.69%)	118(100%)	1.96

To make your presence in the universe and to deliver the service to the door steps of the users in present era, every organization or system should use WWW and Library and information center are not exempted from this situation. Content Management Systems (CMS) are booming in the management of contents over the web. Being a content or information handling organizations, Library and Information Centers are required to be use CMS in proper catering of information. Table 9 facilitates to judge the knowledge of LIS professional towards the CMS. It is clear from the table that Word press CMS is quite familiar than the other listed CMS which has the highest mean value (2.23). However all the listed CMS stands "Below Average" level knowledge among the respondents and indicates works shops or seminars on CMS to be conducted to spread the awareness and knowledge about the CMS among the LIS professionals.

Table 10: Awareness of Open Source Learning Management Software

Sl. No	LMS	Extremely poor	Below average	Average	Above Average	Excellent	Total	Mean
1	Moodle	42(35.59%)	34(28.81%)	39(33.05%)	3(2.54%)	0	118(100%)	2.02
2	Course Sites By Blackboard	26(22.03%)	37(31.35%)	44(37.28%)	9(7.62%)	2(1.69%)	118(100%)	2.27
3	Sakai	44(37.28%)	34(28.81%)	36(30.20%)	4(3.38%)	0	118(100%)	2.00
4	Latitude Learning	38(32.20%)	36(30.20%)	35(29.66%)	9(7.62%)	2(1.69%)	118(100%)	2.09
5	E front	40(33.89%)	38(32.20%)	34(28.81%)	4(3.38%)	2(1.69%)	118(100%)	1.98

In Indian scenario usage of learning management system in the teaching learning process is slowly gaining momentum. Library and information professionals are need to be play a vital role in the adaptation of LMS in the teaching learning process hence the researchers are intended to gauge the level of awareness of library professionals towards the LMS. Table 10 elaborates the familiarity of LIS professions towards the LMS. From the table it is evident that, Course Sites By Blackboard LMS is quite popular among the respondents which stands at "Below Average" level with the mean value 2.27. However all the listed LMS are stands below the average level which shows some special training or orientation kind of programmes are to be conducted on LMS to improve the LIS professional's knowledge on LMS.

Table 11: Usage of Open Source Library Automation software

Sl. No	ILMS	No. of respondents	%
1	Koha	39	33.05
2	ABCD	0	0
3	PMB	0	0
4	New Gen Lib	33	27.96
5	Open Biblio	4	3.38
6	Evergreen	0	0
7	Phpmy Library	0	0
8	Other	24	20.33
9	Non	18	15.25
	Total	118	100

Table 11 reveals that, which ILMS is most used in the automation of library activities, from the table it is known that Koha is the most used Library automation software in comparison with the other listed library automation software. 39 (33.05%) respondents are used the Koha to automate their library activities. 33 (27.96%) respondents used New Gen Lib an Indian originated Integrated Library Management System in the automation of their Library activities. No one among the respondents have used ABCD, PMB, Evergreen and Php My Library for automation of the Library. 24 (20.33%) of respondents are using commercial or proprietary software for the library automation. Whereas 18 (15.25%) respondents are not at all using any ILMS for Library automation. From the table it is learnt that still 15% of the libraries are not yet automated.

Table 12: Usage of open source Digital Library software

Sl. No	Software	No. of respondents	%
1	D Space	45	38.13
2	E-Prints	24	20.33
3	Greenstone	8	6.77
4	OPUS	0	0
5	Digital Commons	0	0
6	CONTENT dm	0	0
7	dLibra	5	4.23
8	Others	4	3.38
9	Non	32	27.11
	Total	118	100

Digitization and archiving of rare and important documents for the future use is highly important need of the hour. For the purpose, Library and Information Centers are using many open source digital library software. Researchers have made an attempt to identify which open source digital

library software is being used in the libraries of Karnataka. Table 12 reveals that Dspace is more used digital library software. 45 (38.13%) respondents are using Dspace 24 (20.33%) respondents are using e-Prints. None of the respondents are using OPUS, Digital Commons, CONTENT dm. Whereas 4 (3.38) respondents are using other Digital Library software. However 32 (27.11%) are not at all using any software for digitalization and preservation of rare and important documents.

Table 13: Source of information about Open Source Software

Sl. No	Source	No. of respondents	%
1	Formal education/training	32	27.11
2	Informal education/training	18	15.25
3	From colleagues/friends	24	20.33
4	Through Internet/ Search Engine	34	28.81
5	Self-study	10	8.47

It is obvious that there should be some ways to know something. Information communication technology is so volatile field that every day development happens. To know the latest developments of the field, LIS professionals have to depend on some sources. Table 13 explains how the LIS professionals are make themselves aware of the open source software. 34 (28.81%) respondents are came to know about open source software through Internet/ Search engine, 32 (27.11%) respondents are gained the knowledge about open source software by undergoing the formal education/training. Whereas 10 (8.47%) responded obtained the information on their own by the self-study.

Table 14: Reasons for not using the Open Source Software

Sl. No	Source	No. of respondents	%
1	Use of commercial software	45	38.13
2	Less user-friendly	16	13.55
3	Inadequate knowledge	24	20.33
4	Expert-dependent	15	12.71
5	Feel risk	18	15.25

From the literature study authors found that, many libraries are not using OSS for library automation and digitalization. To know the reasons for not using the OSS, authors listed out five probable reasons and asked the LIS professionals to opt suitable reasons for not using OSS. Table 14 elucidates the respondent's reasons for not using the OSS. 45 (38.13%) of respondents feels that usage of commercial software in the library is the main reason for not switching over to OSS. 24 (20.33%) respondents have the impression that their present knowledge about the OSS is inadequate. Whereas 18 (15.25%) respondents thinks that, risk factor is high with the OSS hence the adaptation of OSS in the libraries is low.

5. Findings
By analyzing the collected data the following findings are evolved.
- Gender wise numerically males are dominating in the library and information profession.
- Only 15.25% of respondents are have Doctoral Degree in LIS, remaining 84.75% respondents are at different level education. Ranging from basic degree to M.Phil and 59.32% of respondents have cleared NET/SET/JRF exam.
- All the respondents are very familiar with MS Office packages but they have very low awareness about RFID Technology. But overall respondents are at "Average" level at the awareness of ICT based application.
- All the respondents are at the "Below Average" level with respect to open source operating systems.
- Koha, D Space, Word press and Course Sites by Blackboard are the popular Library automation, digitization, content management and learning management systems among the respondents respectively.
- At the awareness and knowledge level, respondents are at "Average" or "Above Average" level with respect to OSS. But at the implementation level they are at below the Average Level.

6. Conclusion and Suggestions
The emergence of ICT technology has drastically revamped the status of all the libraries and Information centres across the world during the last two decades. Here has been a rapid usage of open source Library automation, digitization, content management and learning management systems. In the Indian context adaptation and implementation OSS in the Library and Information Centers it is in the nascent status. Implication of library automation and digitization systems is at moderate level but application of CMS and LMS in the regional Library is in the poor status. To improve the usage of OSS in the libraries, works on hand workshops, conference, seminars are to be conducted at regular intervals. Apex bodies like UGC, AICTE, NCTE, NAAC should encourage the institutions and organizations to implement the OSS. However National Digital Library project is one such good example, the NDL team is conducting the works on hands workshop on implementation of Dspace IR at the university and institutes for national importance.

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