# A Survey On the Usage of Linux Operating System among Library and Information Science Professionals In India

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**Abstract:**

The Paper examines the adoption and use of linux operating system by Library and Information Science (LIS) Professionals in India.The study shows that there is a steady increase in LIS professionals' curiosity and interest in adopting Linux based operating systems for Library automation, Content Management and Digital Library services. Library Professionals from South Indian states,with Kerala at the top,are found to be more familiar with Linux.The support from library authorities is also a pivotal factor for Indian libraries to switch over to linux flavours.

## Introduction

Linux operating system is becoming familiar to all segments of society. The popularity of Linux operating system in academic community is amazing. Majority of  libraries in India have started using Linux operating system in recent times. Library and Information Science professionals in India have realized the need of expertise in Linux, with the advent of library specific Open Source softwares. Library automation systems (e.g. Koha, NewGenLib) and digital libraries (e.g. Dspace, Eprints, Greenstone) are the main categories of Open Source softwares popular in Indian libraries. Many training programmes have been organised at national levels in the past on Open Source softwares running on Linux platform and it has given an opportunity for LIS professionals  to get acquainted with Linux operating system.

## Objectives of the study

To understand the popularity of Linux operating system among library professionals in India,
To find the reasons of using Linux operating system,
To identify the difficulties faced by library professionals to switch over to Linux,
To understand the Linux expertise of library professionals,
To know the satisfaction level of library professionals on Linux.

## Research method

A structured questionnaire was prepared with the help of a web based survey tool called www.kwiksurveys.com. The questionnaires were distributed through LIS Forum (http://ncsi.iisc.ernet.in/mailman/listinfo/lis-forum) and other popular email discussion forums exclusively for Library and Information Science professionals in India. LIS-Forum is the most popular email discussion forum maintained by Indian Institute of Science, Bangalore. In addition, the questionnaire was posted in social networking sites like Facebook and LISLinks. LIS professionals from academic, public, corporate and special libraries participated in the survey. The number of professionals who participated in the survey is 120 and the entire responses have been selected for the study. Statistical Analysis Percentage is used here to sort out the variables.

**Results**

All the questions were sorted out into various categories to get a clear picture of the scenario. The Categories are User Profile, Applications of Linux in Libraries, Linux Learning, Attitude of Authorities to Linux and Perceptions of LIS Professionals.

**User Profile**

The Survey is mainly designed for working LIS professionals. Following are the characteristics of the LIS professionals who participated in the survey.
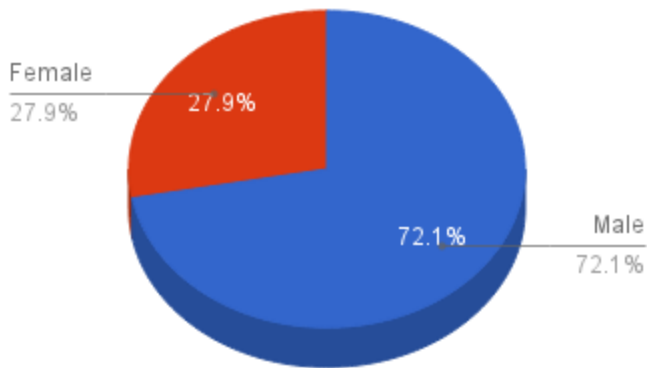
*Gender ratio*



*Fig. 1 Male and female representation in the survey.*

Majority of Linux users are from Male LIS professionals, female representation is limited to 27.9%.
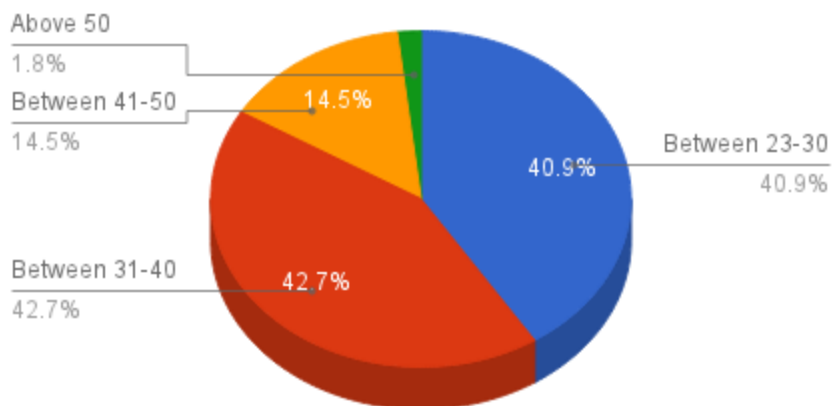
*Age range*



*Fig. 2 Age range of survey participants*

Statistics says that young professionals (age range 23-30 and 31-40) are the avid users of Linux operating system. Only 14.5% of Linux users are from the age range 41-50. Representation

from senior professionals (over 50 years) is very low.
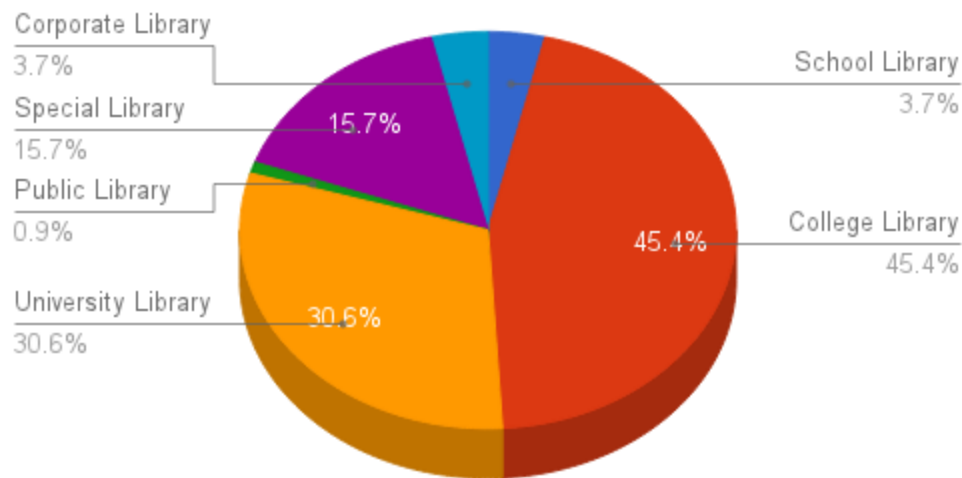
*Type of libraries*



*Fig. 3 LIS professionals representation from various types of libraries*

Awareness is the main factor behind the popularity of Open Source software among LIS professionals. Professional bodies have a good role in creating wide awareness among professionals about cost effective technologies. Majority of Linux users are from college and university libraries. Lessons of Open Source software have been included in the syllabus of refresher courses for library professionals from colleges and universities. This may be a considerable reason of getting high number of participation from colleges and university libraries. Representation of Linux users are less from special (15.7%), school (3.7%), corporate (3.7%) and public (0.9%) libraries.

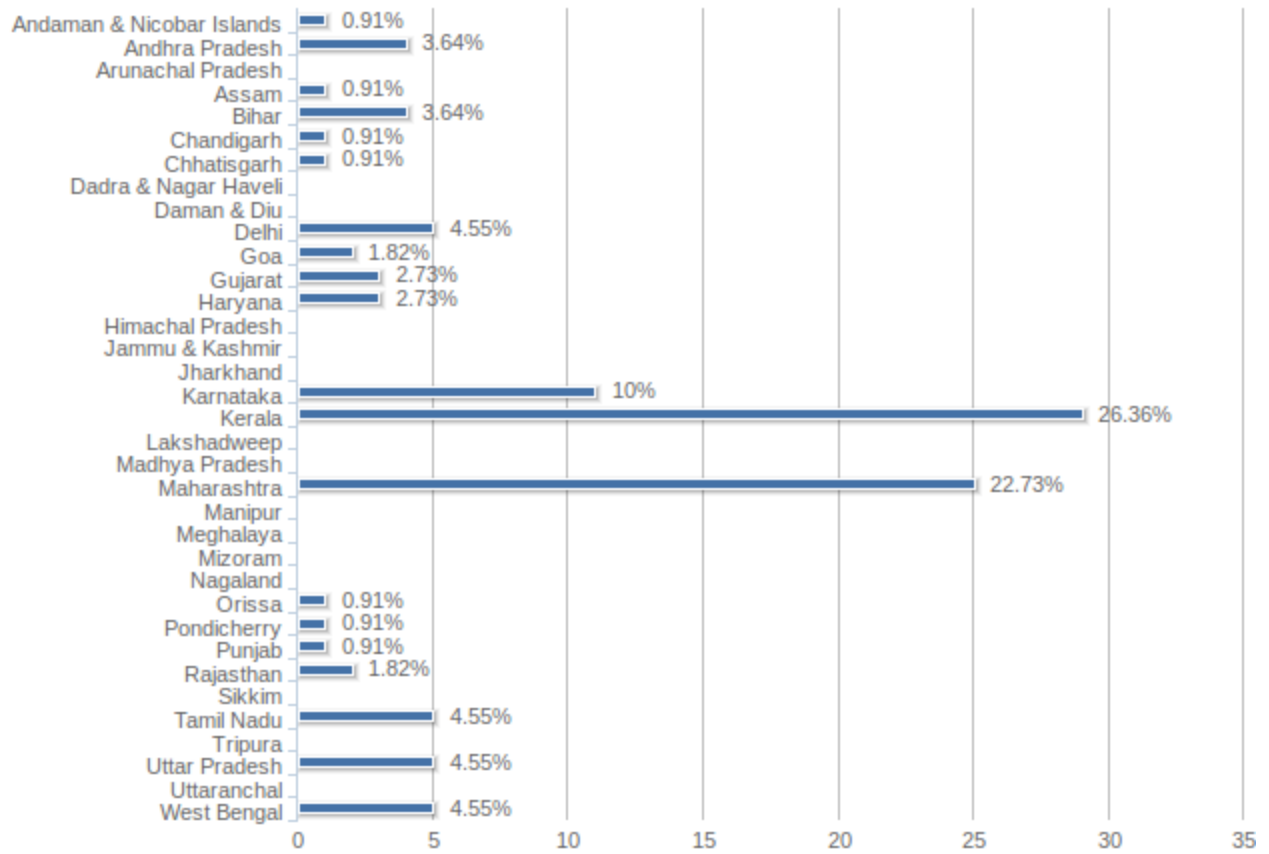*Representation of various states*

*Fig. 4 Linux users from various states in India*

Highest number of LIS professionals who participated in the survey is from Kerala. Maharashtra and Karnataka are in the second and third place respectively. In Kerala, the Government is encouraging the use of Linux operating system in education institutions under state control [**Rajeev**]. The Government of Kerala, has in principle taken a decision to make Koha its official software for computerization of Government administered libraries [**Govt**]. Koha runs only on Linux operating system. This might be the key reason why majority of LIS professionals who participated in the survey is from Kerala.

**Usage of Linux in Libraries**
In this segment we have prepared a set of questions to collect data about adoption of Linux in libraries. Questions have been asked about the motivation to start using Linux, type of installation and the Popular Linux flavour or distributions using in libraries.
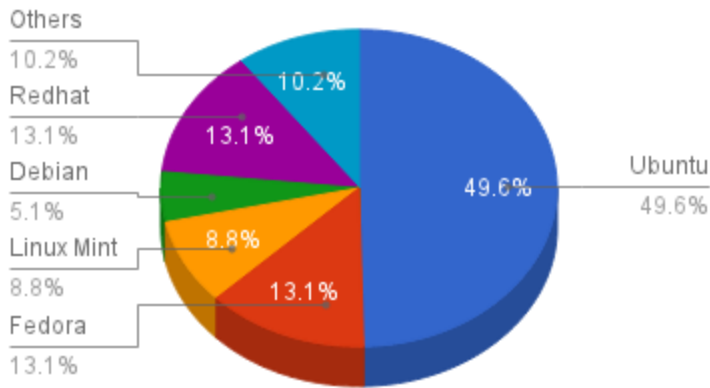
*Popular Linux flavours*

*Fig. 5 Popular Linux distributions among LIS professionals in India*

The survey has revealed out that Ubuntu (49.6%) is the most popular Linux distribution among LIS professionals in India. Ubuntu is considered as the most user friendly Linux distribution. Second popular distribution are Redhat and Fedora (13.1%). Linux Mint (8.8%) is placed third in popularity.
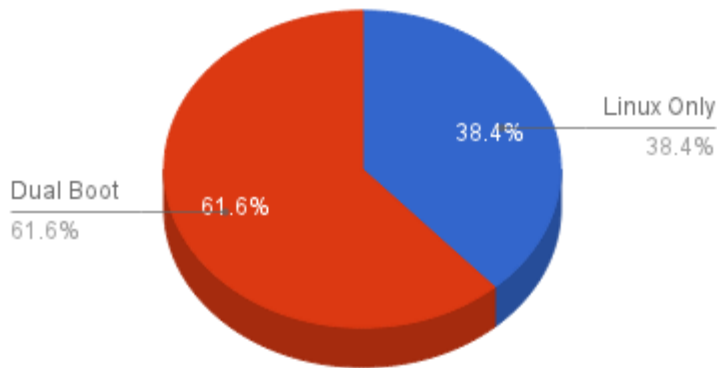
*Type of installation*



*Fig. 6 Type of Linux installation*

Most of the LIS professionals (61.6%) prefer to install Linux along with the existing operating system like Windows. It means that majority of LIS professionals are not in a position to completely switch over to Linux soon.
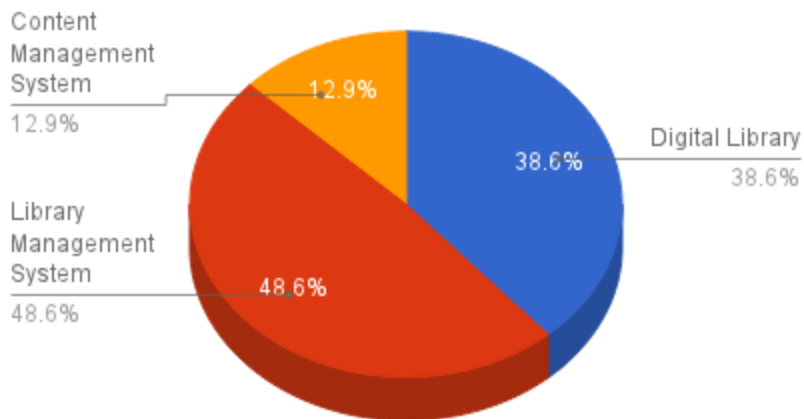
*Application of Linux in libraries*

*Fig. 7 Applications running on Linux in libraries*

LIS professionals use Linux for installing software useful in libraries. Open Source library management systems and digital library softwares are becoming popular in libraries. Koha, NewGenLib, Evergreen etc. are popular Open Source library management systems. Dspace, Greenstone and Eprints are popular Open Source digital library/repository softwares. Majority of LIS professionals (48.6%) have installed library management systems on Linux. Digital libraries (38.6%) are also running on Linux operating system. Another segment of LIS professionals installed content management systems on Linux. Content management systems are used for building Intranet portals and websites.

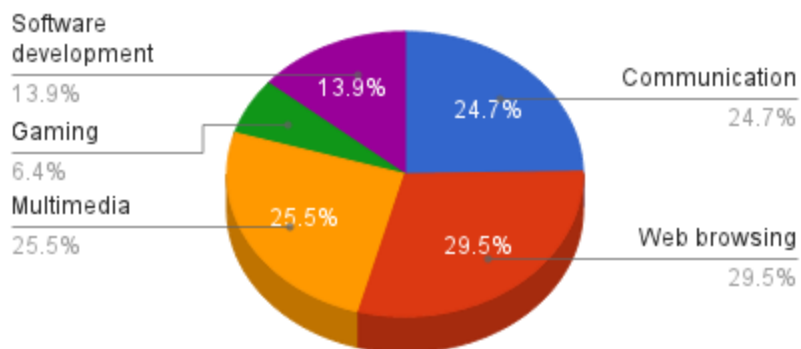*Other utilities running on Linux*



*Fig. 8 Usage of Linux applications*

In addition to library specific applications, LIS professionals make use of Linux applications for various purposes. Linux operating system is suitable for desktop computers in day to day

activities. Compared to Windows operating system, Linux has lesser chance of being affected by malware [**Ubuntu, Librenix**]. Web browsing (25.9%), multimedia (22.4%) and communication (21.7%) are the main Linux utilities make using by LIS professionals.

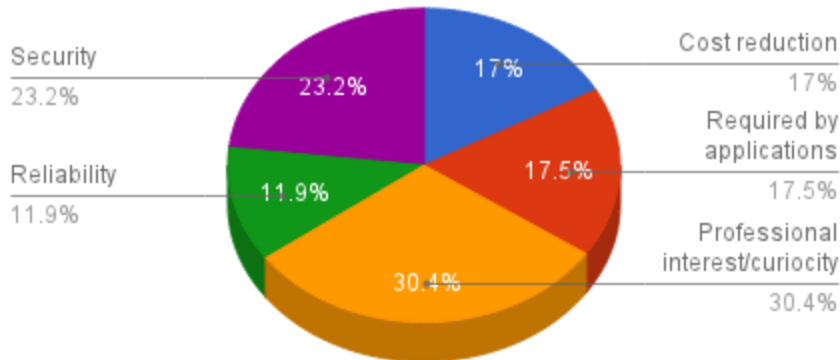*Motivation for implementing Linux*



*Fig 9. Reasons for using Linux*

Professional interest/curiosity (30.4%) is the main reason to adopt Linux by LIS professionals. Security (23.2%) features of Linux is another prominent reason for linux being selected in libraries. The security of Linux operating system is based on the philosophy of "given enough eyeballs, all bugs are shallow"; any flaws in source code is easily caught and fixed with the help of a large number of developers [**PC Magazine**]. A Lot of Open Source softwares are suitable in libraries run only on Linux operating system. For example, Koha is a popular Open Source library management system  and it runs only on Linux. So, 17.5% of LIS professionals use Linux as it is a prerequisite  for installing many useful library softwares. Cost reduction (17%) is another important factor increasing the use of  Linux in libraries. A benchmarking study funded by Open Source Victoria has found that the  total cost ownership of Windows operating system is higher than that of Linux [**Cybersource**].

**Learning Linux by LIS professionals**
Linux learning has two aspects - desktop and server side usage. Linux desktop offers very user friendly interface and look and feel is similar to Windows operating system. Therefore, a person with Windows experience can familiarize with Linux desktop easily. Ubuntu based distros are considered to be the most user friendly Linux operating systems [**OS News**]. Linux desktop is ideal for running office suite, Internet browsing, multimedia applications etc. However, It requires more background knowledge on Linux architecture and various commands for running server edition. Server edition of Linux operating system is useful for the installation of library management systems and digital libraries for serving large number of users.
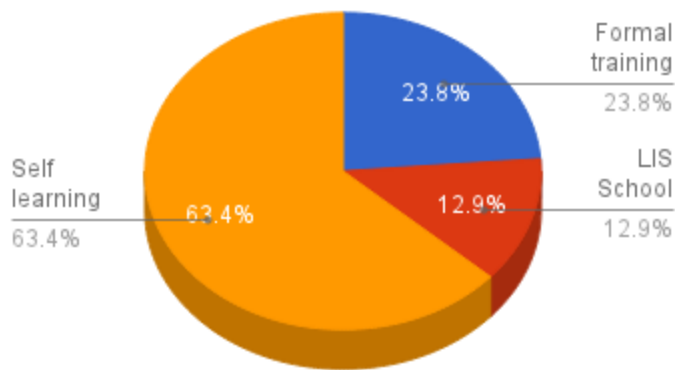
*Fig. 10 How LIS professionals learned Linux.*

Plenty of free educational resources on Linux are available in Internet. A simple search in WWW using any search engine can provide answers to common problems associated with Linux. Learning by trial and error is a globally approved method of learning Linux. Open Source software has no trial version, so anybody can download the full operating system Package. Majority of LIS professionals (63.4%) adopted self learning to acquire Linux skills. A small group of professionals (12.9%) learned Linux from LIS schools. This can be considered as a good initiative from LIS schools and it gives an opportunity for students to get familiar with cost effective and cutting edge technologies. Professional associations, government organisations and various libraries in India have organised Linux training programmes exclusively for LIS professionals. Such programmes could have made good impact on the Linux expertise of LIS professionals.
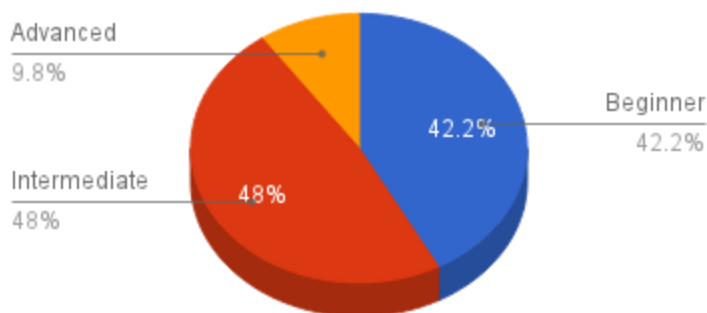
*Linux expertise*



*Fig. 11 Level of Linux expertise*

Majority of LIS professionals (48%) Linux expertise is intermediate, 42.2% are beginners and 9.8% are advanced users.

**Linux and library authority**
Support from mother organisation is necessary to implement a new operating systems or to replace an existing one. A Lot of myths on Linux, rooted in organisational level, which are

creating  barriers in getting the approval to use Linux. All myths regarding Linux are fictitious and derived from lack of awareness or disseminated by competing vendors [**Noyes**].
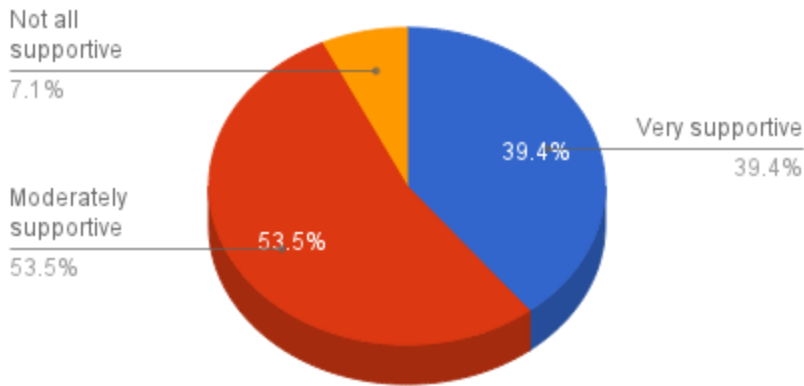


*Fig. 12 Library authorities attitude towards Linux implementation.*

The survey result says that 53.5% of LIS professionals agreed that their authorities were moderately supportive to adopt Linux in their libraries. It proves that there is a greater need for campaign to debunk the myths about Linux operating system. About 39.4% of them received positive attitude from library authority to use Linux. A small portion of LIS professionals (7.1%) says that their authorities are not supportive in the case of Linux implementation.

**Perception of LIS professionals on Linux operating system**
In this segment a set of questions were asked to expose LIS professionals realistic views of Linux operating system. On the basis of their experience,they were respond to issues like how they evaluate security, performance and reliability of Linux,how to compare Linux against proprietary operating system, can Linux act as an alternative in all aspects against existing one and how well has Linux met LIS professionals expectations.
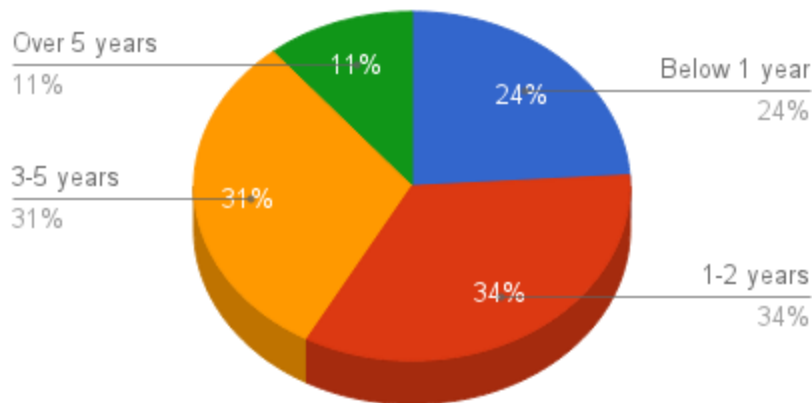
*Years of experience*



*Fig.  Experience in Linux*

Majority of LIS professionals (34%) have been using Linux for about 1-2 years. About 24% of the LIS professionals are newcomers in this block and have been using Linux for only a year.

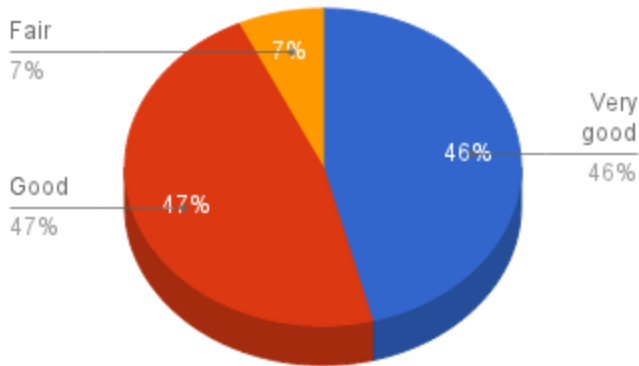*Security, performance and reliability*



*Fig. 14 Security, performance and reliability of Linux*

Linux is considered as a reliable operating system compared to proprietary softwares. Government departments and enterprises, especially educational institutions in India have adopted Linux and other Open Source softwares [ **Gupta**] [**Bloomsberg**]. Virus threat is comparatively very low and it enhances the performance and reliability of Linux operating system.
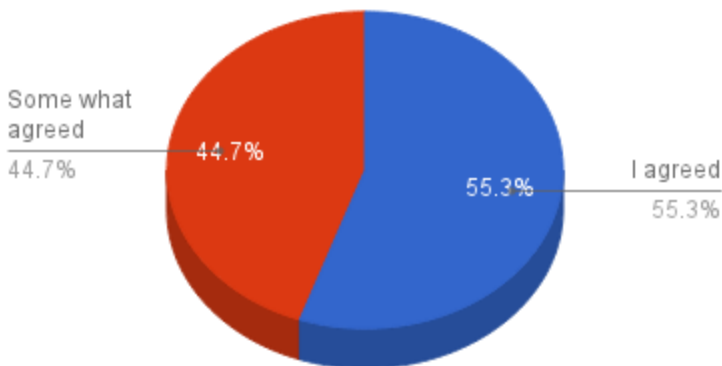
*Linux vs. Proprietary Operating System*



*Fig. 15 Linux vs. proprietary operating system.*

The survey asked to LIS professionals " Are Linux distributions alternatives in all aspect compared to other proprietary platforms?". Majority of the Professionals (55.3%) said that Linux can be an alternative to existing proprietary operating system. A few years ago , Linux users felt the difficulty in finding applications suitable for various purposes or equivalent Windows based applications in Linux operating system. Now most of the popular windows applications have Linux versions (e.g. Skype, VLC Player). Availability of favorite applications in Linux operating

system has encouraged users to switch over from proprietary operating system.
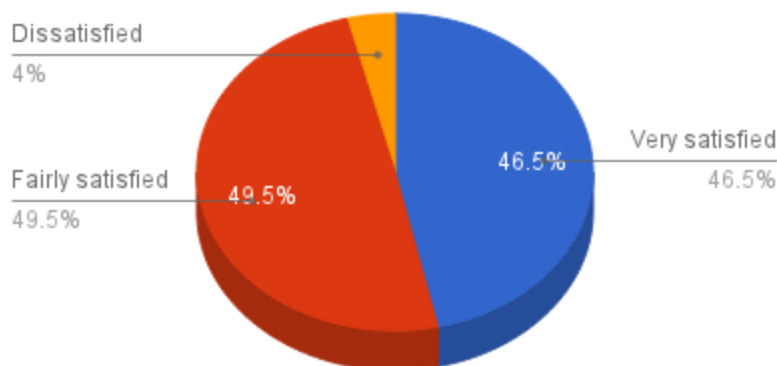
*Expectations*



*Fig. 16 Expectations of LIS professionals on Linux*

Open Source softwares satisfy the expectations of users through collaborative software development process. Users can directly involve in Linux and Open Source softwares development process. Programming skills is not mandatory to take part in software development. The areas in which users' collaboration is expected to include  input suggestions, documentation, helping others to solve problems, bug fixing, code writing and inspection.  If a Linux operating system does not work on the expectations of a user, he can easily switch to another Linux distribution. This situation is not the same with proprietary operating system. Users were not satisfied when Ubuntu and GNOME 3 were released;they reacted with outrage, many switching to alternatives.With proprietary operating systems,user have no control over such situations. Windows users might grumble about changes like the upcoming Windows 8 interface, but after venting they conclude that they can do nothing, and learn to live with the changes [**Byfield**].

Among the total respondents, 49.5% of professionals say that Linux fairly satisfies their expectations.46.5% of professionals are very satisfied and 4% of professionals are dissatisfied.

**Conclusion**
Linux operating system is more popular among young LIS professionals in India. Survey result shows that majority of Linux users are between the age range of 23-30 and 31-40. Representation of females is comparatively less (27.9%) and we can see male (72.1%) domination in the usage of Linux operating system. Librarians working in colleges (45.4%) outwit other libraries in using Linux. Use of Linux in public libraries (0.9%) is very low. Statistics shows that popularity of  Linux among LIS professionals from South Indian states (Kerala, Karnataka, Andhra Pradesh, Tamilnadu) (44.55%) is higher than other parts of India.There is no representation from North East states (Manipur, Meghalaya, Mizoram, Nagaland) and from a few other states. LIS schools and professional organizations should take initiative to introduce the applications of Linux operating system in libraries.

Ubuntu (49.6%) is the  most popular Linux distribution and 61% of the LIS professionals installed Linux along with Windows operating system. It shows that, LIS professionals have not achieved confidence to run Linux as stand alone system. Majority of libraries (87.6%) are using Linux to install and run library management systems (48.6%) and digital library softwares (38.6%). Library professionals are also using Linux for web browsing, multimedia applications and communication purposes. Professional interest/curiosity is one of the the major reason to attract LIS professionals (30.4%) to Linux. Another segment of users (17.5) installed Linux operating system to run application softwares required in their libraries. Self learning method is adopted by majority of LIS professionals (63.4%)  to acquire the skill set to operate Linux, and about 12.9% of the professionals learned Linux from LIS schools. At the institutional level, only 39.4% of LIS professionals got good support from authorities to use Linux in libraries.

Majority of LIS professionals are newbies in Linux, 58% of users have been using Linux for 1-2 years. Only 11% of LIS professionals are using Linux for last five years. Majority of LIS professionals (93%) have good impression on the  security, performance and reliability of Linux operating system.53% of LIS professionals say that Linux can be an alternative to existing proprietary operating system. And finally, 49.5% of users are fairly satisfied and 46.5% of users are very satisfied with the ability of Linux to keep their expectations as a complete operating system.

The survey results point out that Linux operating system is gaining popularity among LIS professionals in India. Technology management is the biggest challenge for library professionals in India. Fear, uncertainty, and doubt are the main challenges to adopt Open Source technology [**Nicole**]. Structured training programmes for LIS professionals and students can eliminate prejudices against Linux operating system. Open Source solutions are cost effective and efficient in tackling technology management in libraries.

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