EVALUATION OF OPEN SOURCE DIGITAL LIBRARY SOFTWARE FOR THE KNOWLEDGE MANAGEMENT OF THE MEDICINAL PLANTS OF KERALA

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ABSTRACT

People depend on the plants since the time immemorial for their various necessities such as food, fodder and medicine. Conservation of Medicinal Plants and development of this specific sector in the country is deprived due to the scattered and inadequate information. Digitizing knowledge on Medicinal Plants is a dire necessity as this tacit comprehension dies with the connoisseurs in the field. The emergence of Open Access and Digital Library concept has completely revolutionized the knowledge management and information storage landscape. Information seeking approach of the contemporary scholars and scientists are not only limited with the traditional paper media but also with the diverse digital formats that has piloted the surfacing of prevailing digital and virtual libraries. Since the digitization with proprietary software requires substantial capital, the Open Source Digital Library programmers being dependable to prevail the access barriers of scholastic information. This evaluation study is intended to give a perception about the strength and weakness of most popular Open Source Digital Library software which are widely used for archiving, maintaining, disseminating and preserving the specialized digital information.

Keywords: Digital Library, Virtual Library, Knowledge Management, Medicinal Plants, Open Access, Software Evaluation.

1. INTRODUCTION

People have been associated with plants since time immemorial and depend for their various uses such as food, fodder and medicine. From the very earliest days of civilization, mankind has turned to plants for healing, a tradition that has survived opulently till the arrival of modern medicine. The traditional proficiency and knowledge integration of many generation in the

course of time had developed the Ayurveda, Homeopathy, Siddha, Unani and the Tribal System of medicine. This knowledge on conventional medicine had been applied in the diagnosis, prevention and exclusion of physical, mental or social disparities and carried over from generation to generation either verbally or in writing. Currently 65% of the Indian population depends on the medicines developed from plant ingredients for the first line of primary health care for human alleviations as it has no side effects. The Indian Sub-Continent is a vast repository of Medicinal Plants that are used in traditional medical treatments. Rout S[9] has quoted traditional definition of Medicinal Plants which is given in Ashtanga Hryudaya (600 AD), Sutra Sthana chapter 9 verse 10 as :

"Jagatyevamanoushadhamnakinchitvidyatedravyamvasatnanartha yoga yoh"

(There is nothing in the Universe, which is non-medicinal, which cannot be made use for many purposes and by many modes)

The impact of the globalization and market oriented development of medical systems including alternative systems, the demand of medicine plant as the integral component for its products is increased. According to Mohanlal (2017)[7], the elimination of plants is hundred times more than the power of the nature to reproduce it which is fastening the extinction of all such plant species from the earth. It is very vital to impose legal measures to prevent the uncontrolled destruction of the Medicinal Plants and implant awareness through the sustainable production and conservation. One of the major difficulty met with this sector is the paucity of authentic information. Knowledge about the traditional usage of Medicinal Plants can be found in old books and periodicals but most of them are out of print and are not available even with the large libraries. Development of a machine vision system for the knowledge management of Medicinal Plants is a demanding necessity as this tacit knowledge dies with the experts in the field. A knowledge hub on Medicinal Plants having the medicinal and chemical properties, identity, habitat, useful parts, dosage, conditions of collection and their common usages is required to propagate the research in this sector. The history of Open Source Software began with the early stages of computer and software development. At that, time programmers and developers frequently shared their software freely. Advent of companies in software development with the aim of profit making restricted the culture of sharing the source code of software. Velmurugan[14] identified the milestones in the history of Open Source Software as follows:

- Richard Stallman formed GNU project -1983
- Creation of Free Software Foundation -1985
- Linus Torvalds developed Linux kernel- 1991

- Open Source Initiative (OSI) formed -1988.

The Open Source Software(OSS) concept has gained widespread acceptance in libraries across the world to save exorbitant costs involved in buying commercial software and paying annual maintenance costs and upgrading costs incurred by commercial suppliers as well. Information seeking approach of the contemporary scholars and scientists are not only limited with traditional paper media but also with diverse digital formats that has piloted the surfacing of prevailing Digital or Virtual Libraries. Digital Library refers to a collection that constitutes electronic resources, accessible through the World Wide Web. It often contains electronic versions of books, photographs, videos that are owned by a "Physical" library [13]. This paper deals with the comparison of popular Open Source Digital Library Software from diverse point of view. The comparative index will help the professionals who are planning to create the Digital Libraries.

Though are many Open Source Software or Digital Repository creating software programmes available in the Internet sites and from the other secondary sources of information , the following DL-OSS packages are more popular and have been using widely across the world.

  i.   DSpace (http://dspace.org)
 ii.   Greenstone (http://greenstone.org)
iii.   E-Prints (http://eprints.org)
 iv.   Fedora-Commons (http://fedora-commons.org/Fedora-Commons)
  v.   CDS Invenino (http://invenio-software.org/)
 vi.   MyCoRe (http://mycore.org/)

2. REVIEW OF LITERATURE

Basawaraj (2008)[2] suggested the development of a machine vision system to index knowledge on medicinal plants is an urgent requirement since this tacit knowledge dies with the experts in the field. Krishnan Nambiar (1985)[6] pointed out that though the forests of Kerala have a large number of medicinal plants but proper information about them is still lacking as there is no authentic publication on forest resources. Therefore very little information is available on the medicinal properties of many species. He also pointed out that the shrinking habitat of the medicinal plants and the ever increasing demand for the raw drugs pose great threats to some species that are in the verge of extinction. Saracevic (2000)[10] stated while presenting the challenges in digital library evaluation that "a great many things are being done and explored, but evaluation is conspicuous by it's absence in the majority of published works on digital libraries, be it research or practice". According to Mohanlal and Krishnaswami (2017)[a] the Open Source Digital Library software can introduce their search and development patterns of the society. Scientists and librarians needed proper training in linking the digital libraries with the

web sites of their organization and the organizations can implement a policy decision for digital built-up of their subject knowledge by employing the expertise of qualified professionals in knowledge organization, management and dissemination. Baskaran (2009)[3] suggested that the users of digital libraries are the universal users who should have the facility to access all created and acquired digital sources of information in the form of electronic text, images, maps, sounds, videos etc. Randhava (2012)[8] suggested that the Greenstone and DSpace are two suitable software for developing digital libraries with slight difference in their features and workflows. The DSpace has more worldwide installations and featured for creating large and complicated digital libraries where as the strength of Greenstone Digital Library Software is its simplicity and overall performances. Witten (2005)[16] stated that both the Greenstone and DSpace are widely using Digital Library software systems and prospective users sometimes do not know which one to adopt. The aims of the two systems are very different though their domains of application do overlap. He describes that a bridge between the productive versions of the Greenstone and DSpace allows the users of either system to easily migrate to the other, or continue with a combination of both. This bridge eliminates the risk of finding oneself locked in to an inappropriate choice of system.

3. DATA ANALYSIS AND FINDINGS

Knowledge Management in any organization requires more effective methods of information handling, speedy transfer of information and linking of information with individuals and their activities[11]. This study focused on the comparative analysis of popular open source digital library Software packages against the set of evaluation criteria under broad and narrow subject categories to identify its limitations and effective alternative for the digitization of valuable medicinal plant knowledge in Kerala State. A quantitative questionnaire is used to analyze the data to find information on different software's and its limitations. Ader[1] described data analysis as a process of inspecting, cleaning, transforming, and modeling data with the goal of highlighting useful information, suggesting conclusions, and supporting decision making. Various statistical procedures such as Descriptive statistics, custom tables, frequency analysis, Reliability analysis, and various charts were used to present the data for various objectives and research questions. The study evaluated the opinion of 148 librarians and professionals working in digital library field to analyze the strength and weakness of Digital Library software to archive medicinal plant knowledge available in Kerala State. Bernard[4] states that most studies are based on the samples between 30-60, hence the researcher found it appropriate to use the stated number. This was considered to be a reliable sample size to help the researcher to conclude the exercise.

3.1 Reliability Analysis of scale variables

The reliability (scalar) analysis of the instrument was also done; this analysis allowed the researcher to study the properties of measurement scales and the items that compose the scales. The scalar analysis procedure calculates a number of commonly used measures of scale reliability and also provides information about the relationships between individual items in the scale. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. According to Cuieford[5,] a Cronbach's α value that is greater than 0.7 indicates high reliability and a Cronbach's α value that is less than 0.35 represents unacceptable reliability.

Reliability Statistics				
N= 148	Mean	Std. Deviation	Cronbach's Alpha	N of Items
Easy to install and changes	3.87	1.20	.558	15
Maximum level of system security	4.11	0.99		
User friendly for front end operations	4.02	1.21		
User friendly for back end operations	4.44	0.91		
Easy retrieval using relevant key words	4.14	0.74		
High level multilingual support	3.78	1.14		
Great scalability	4.41	0.63		
Good system support and documentation	4.27	0.78		
High level of compatibility	4.16	0.74		
Easy importing and exporting facility	4.21	0.87		
Better support to bug fixes and support	4.32	0.70		
High level of inter-operability	3.89	0.99		
Maximum share ability	4.44	0.87		
Ease of deployment and integration	3.95	1.16		
Highly useful in providing digital library services	4.39	0.81		

Table 3.1: Digital Library Software : considering the overall performance and use

The resulting α coefficient of reliability ranges from 0 to 1 in providing this overall assessment of a measure's reliability. If all of the scale items are entirely independent from one another (i.e., are not correlated or share no covariance), then α = 0; and, if all of the items have high covariance's, then α will approach 1 as the number of items in the scale approaches infinity. In

other words, the higher the α coefficient, the more the items have shared the covariance and probably measure the same underlying concept. The above reliability shows that the scale variables Cronbach's alpha value is.558% which is above 50% which indicates a fair level of internal consistency for our scale. This is an acceptable reliability for analysis.

3.2 Research Questions

3.2.1 Nature of Institutions

The following table shows the type of institutions who participated in the study. A frequency table provides the information

	Frequency	Percent
Government(Universities, Colleges etc.)	56	37.8
Private college/Institute Library	36	24.3
Commercial	2	1.4
Research Institute	34	23.0
Public Library	10	6.8
School Library	10	6.8
Total	148	100.0

Table 3.2.1: Nature of the Institutions

The above table shows that more respondents were from the group of Govt. Institutes (37.8%) followed by Private College/ Institute libraries (24.3%). Research Institutes contribute 23% and public libraries and school libraries were 6.8% each. The targeted population is well qualified and appropriate for answering the questions.

3.2.2 The Digital Library Software used in the Libraries

The below table shows the digital library software used in the targeted libraries.

Software	Frequency	Percent
CDS Invenino	1	.7
Dspace	51	34.5
E Print	33	22.3
Greenstone	63	42.6
Total	148	100.0

Table 3.2.2: Digital Library Software used

The above table shows that Greenstone is the most widely used software in the targeted libraries (42.6%) followed by Dspace (34.5%). The e-Prints software is supported by 22 % and a few (.7%) were supported for CDS Invenino.

3.2.3 Digital Library is important in attaining the aims and objectives of the Organization

The following Likert Scale variable provide respondents opinion on this question. A Likert Scale that contains five values - strongly agree, agree, neither agree nor disagree (Neutral), disagree, and strongly disagree. A descriptive statistics and frequency is used to present the data . The descriptive statistics shows Mean,Std. Deviation, Skewness and Kurtosis value of the variable. Mean is to describe the sample with a single value that represents the center of the distribution of the data. Use of the Standard Deviation is to determine how spread out the data are from the mean. A higher standard deviation value indicates greater spread in the data. Skewness is a measure of symmetry, or more precisely, the lack of symmetry. A distribution, or data set, is symmetric if it looks the same to the left and right of the center point. A symmetric distribution such as a normal distribution has a skewness of 0, and a distribution that is skewed to the left, e.g. when the mean is less than the median, has a negative skewness. Kurtosis is a measure of tail extremity reflecting either the presence of outliers in a distribution or a distribution's propensity for producing outliers.[15]

Descriptive Statistics					
	N	Mean	Std. Deviation	Skewness	Kurtosis
Digital service is important in attaining the aims and objectives	148	4.18	.535	.138	.068
Valid N (list-wise)	148				

Table 3.2.3: Descriptive Statistics

Here the mean is 4.18 with a Std. Deviation of .535.

Items	Frequency	Percent
Neutral	10	6.8
Strongly Agree	101	68.2
Agree	37	25.0
Total	148	100.0

Table 3.2.3.1: Frequency of the scale variable DL service is important to attain objectives

The above table shows that 93.8% either strongly agree or agree that digital service is important in attaining the aims and objectives of the institution. This was reported neutral by 6.8%. This shows the importance of digitization.

3.2.4 Experience (years) in using the present Digital Library software in your library

The following table shows the number of years and the targeted library which is using the current software

	Frequency	Percent
1	5	3.4
2	7	4.7
3	20	13.5
4	38	25.7
5	12	8.1
More than 5 years	66	44.6
Total	148	100.0

Table 3.2.4: Experience in years using the current software

Librarians and professionals who have varied years of experience. However, 44.6% reported that they were using the current software for more than 5 years followed by 25.7% who were using it for 4 years. Current library software which was used for 3 years by 13.5% and another 8.1% were using it for 5 years. Only 7 respondents out of 148 (4.7%) were using it for 2 years and another 5 of them reported that they were using it for 1 year.

3.2.5 : The drawbacks of the present Digital Library Software used in the Library

	Yes	%	No Response	%	Total
Difficult to install	86	58.10%	62	41.9	148
Too much time taking at the time of installation	76	51.40%	72	48.6	148
More supporting software needed for installation	117	79.10%	31	20.9	148
Complex to use	64	43.20%	84	56.8	148
Too much time taking at the time of adding new data	111	75.00%	37	25	148
Less/No compatibility	49	33.10%	99	66.9	148
No training facility after installation	57	38.50%	91	61.5	148
Less/no documentation	46	31.10%	102	68.9	148
less or no support (online/offline)	57	38.50%	91	61.5	148
No multilingual or bilingual support	52	35.10%	96	64.9	148
No sharing facility	7	4.80%	141	95.3	148
Complex procedures for importing or exporting data	84	56.80%	64	43.2	148

Table 3.2.5: Drawbacks of current Software

The major difficulties were identified and reported in the above table. According to this, 58.1 % experienced difficulty to install the software compared to 41.9 who did not respond to it. Too much time taking at the time of installation is supported by 51.4% against 48.6% . To work on the software, more supporting software's were needed for installation is supported by 79.1% against 20.9 who were not experienced with any problem. The software is complex to use for 43.2%. However, majority 56.8% did not respond to it. Too much time taken at the time of adding new data is a problem and was reported by 75% of respondents. This was not a problem or did not respond by 25%. The current software had Less/No compatibility is supported by 33.1 % against 66.9% who did not respond to it. No training facility after installation is supported by 38.5%. However, majority 61.5% did not respond. Regarding the question about Less/no documentation, majority did not respond to it (68.9%). This was supported by 31.1 % .The current software had less or no support (online/offline) is supported by 38.5 % against 61.5%

who did not respond to it. The current software had no multilingual or bilingual support which is accepted by 35.1% compared to 64.9% were not responded. The software had sharing facility this was not supported by only 4.8% compared 95.3 who did not respond to it. The current programme has featured with complex procedures for importing or exporting data. This is a major problem and was supported by 56.8%. This was not responded by 43.2%.

**3.2.6: Operating System installed for the current Digital Library Software**
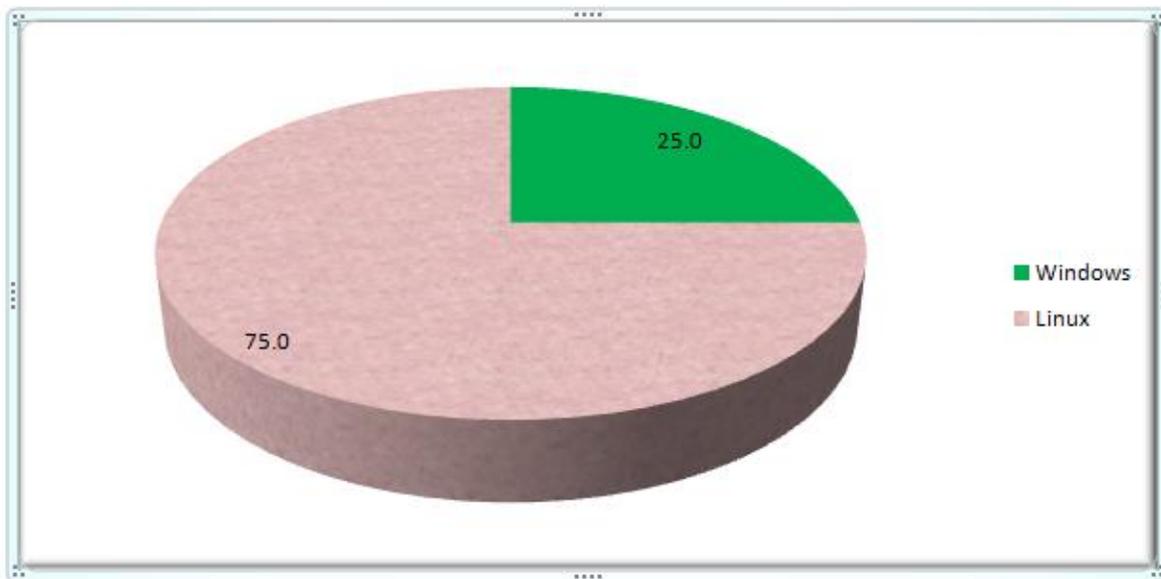
Fig. 3.2.6: Pie Chart shows the representation in terms of percentage

The above figure shows that 75% users were using Linux as the operating system compared to 25 % who were using Windows

3.2.7 : Who customized and installed the present digital library software in the organization
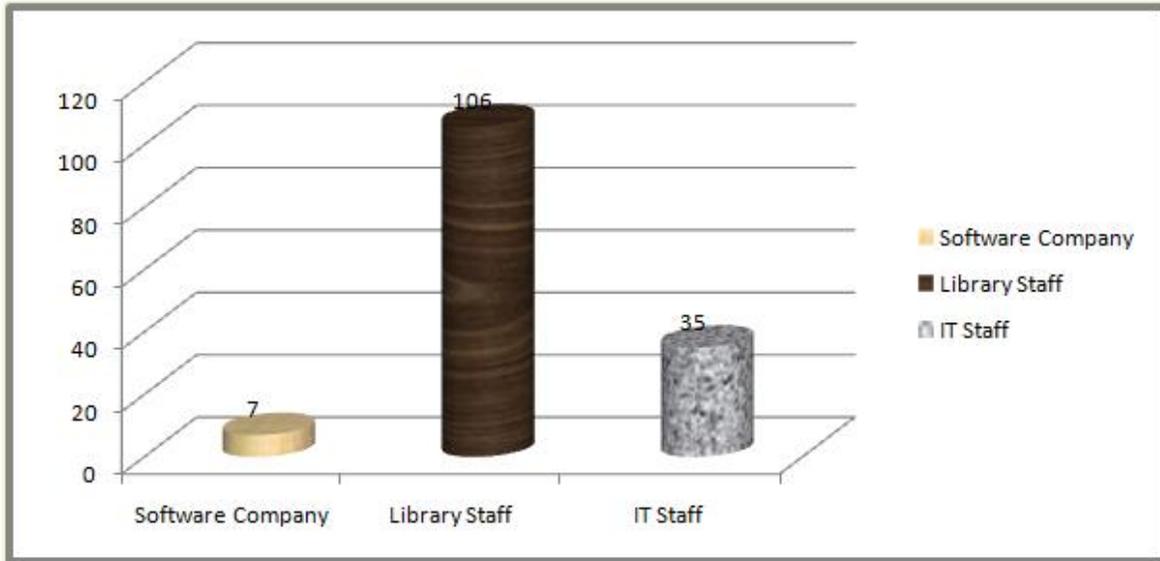
Fig. 3.2.7: Customization and installation

The above figure shows that in most of the institutions , the library staff themselves customized and install the current software (106 out of 148). However, 35 librarians reported that their software were installed by IT staff and 7 of them were used Software companies to install and customize their digital libraries.

**3.2.8 Who maintains the Digital Library of the Organization**
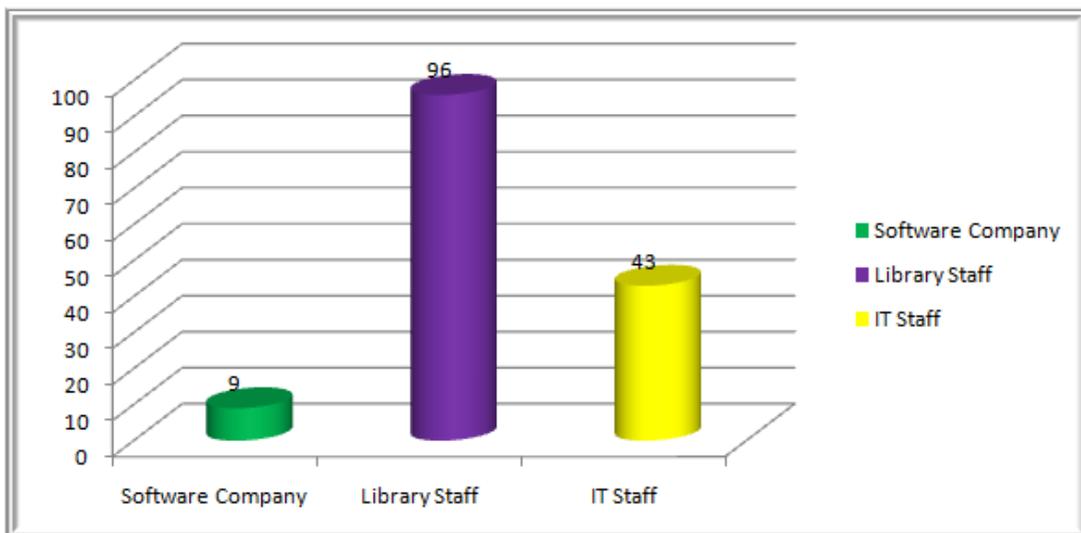
Fig. 3.2.8: Digital Library maintenance

Regarding the question of maintenance, the above figure shows that the library staff themselves maintain most of the libraries (96 out of 148). However, 43 of them are being maintained by IT staff of the organization and another 9 of them reported that they were supported by Software companies to maintain their digital libraries.

3.2.9 : Library documents booked for digitization

The question was analyzed using Multiple Response Procedure. Multiple Response refers to the situation when people are allowed to tick more than one answer option for a question.

Items	Responses		Percent based on answers
	N=148 How many times was the aspect mentioned	Percentage based on respondents	
journals in print	96	12.5%	64.9%
Thesis/Dissertation	51	6.7%	34.5%
conference proceedings	69	9.0%	46.6%
Digital surrogates of Library Materials	21	2.7%	14.2%
Images	142	18.5%	95.9%
Video	74	9.7%	50.0%
Audio	106	13.8%	71.6%
Metadata	115	15.0%	77.7%
News Paper clips	92	12.0%	62.2%
Total	766	100.0%	517.6%

Table 3.2.9: Incidence of library documents digitized

The above multiple response table shows how respondents answered this question. All the 148 respondents were answered (N=148). Those 148 people ticked 766 times which is almost 5 boxes per respondents. The column How many times was the aspect mentioned explains the occurrence of the answers. For example question about the digitization of Print Journals was answered 96 times by 148 respondents. The other column percent based on answers uses the number of cases as base. The assumption is that 95.9% respondents considered Image to be an important aspect to build the digital library which is 18.5% of all the answers. This was followed by metadata which is 15%. Audio is another important aspect to be digitized according to 13.8% and another 12.5% reported that it should be Journals in print. News paper clips were digitized

by 12% and another 9.7 % digitized information on video. Digitization of Thesis/Dissertation done by 34.5% which is 6.7% of all the answers.

3.2.10: Major changes carried out while implementing the present Digital Library software

The question was analyzed using multiple response procedure. Multiple response refers to the situation when people are allowed to tick more than one answer option for a question.

		Responses		Percent based on answers
		N=148	Percentage based on respondents	
	Implement New features	20	12.6%	13.5%
	Significant changes in source code	25	15.7%	16.9%
	Significant user interface customization	5	3.1%	3.4%
	Minor changes like style sheet/ font/ logo	13	8.2%	8.8%
	No changes	96	60.4%	64.9%
Total		159	100.0%	107.4%

Table 3.2.10: Changes in Frequencies

The above table shows that majority of respondents answered 'No changes' which is 64% based on cases and 60% based on occurrence of the response (all the answers). The major changes carried out while implementing the software could be, significant changes in source code which is reported by 16.9% of total respondents which is 15.7% of all answers. This was followed by 'Implementing New Features' and minor changes like Style/Font /Logo. A few reported for significant changes on user interface customization.

**3.2.11: Clients to whom you provide access to Digital Library**
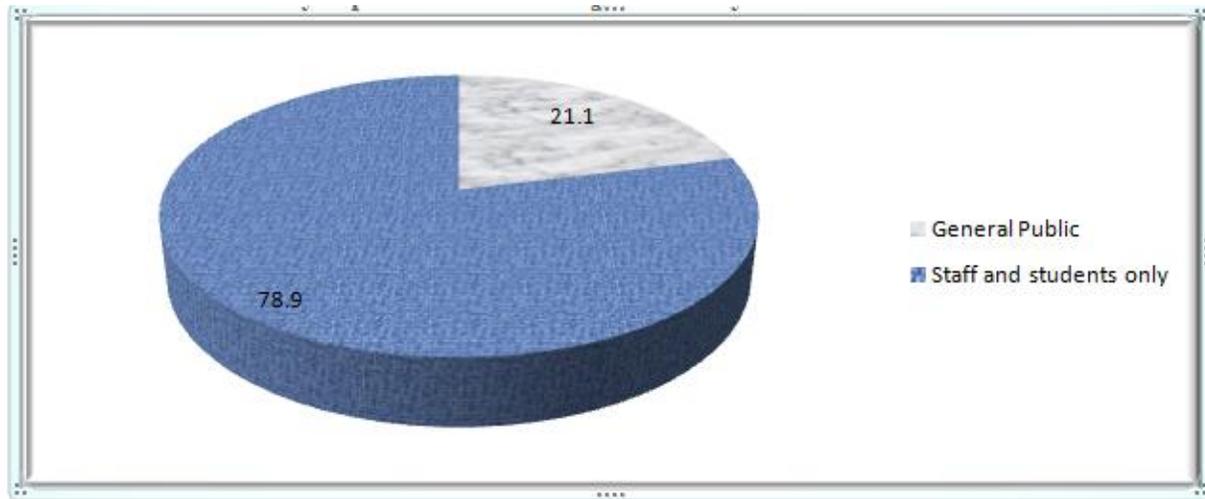
Fig. 3.2.11: Providing Access

The above figure shows that the access to digital library is mostly for staff and students (78.9%) and 21.1 % for General public.

3.2.12: Evaluation of Digital Library considering the overall performances and its uses

	Mean	Std. Deviation	Skewness		Kurtosis	
				Std. Error		Std. Error
Easy to Install and Register	3.87	1.197	-.714	.199	-.724	.396
Maximum Level of System Security	4.11	.986	-.837	.199	-.404	.396
User Friendly for Front End Operations	4.02	1.209	-.882	.199	-.381	.396
User Friendly for Back End Operations	4.44	.905	-1.378	.199	.869	.396
Easy Retrieval using Relevant Key Words	4.14	.744	-.223	.199	-1.157	.396
High Level of Multilingual Support	3.78	1.142	-.747	.199	-.420	.396
Great Scalability	4.41	.626	-.561	.199	-.596	.396
Good System Support and Documentation	4.27	.779	-.514	.199	-1.172	.396

High Level of Compatibility	4.16	.735	-.357	.199	-.727	.396
Easy importing and exporting facility	4.21	.875	-.732	.199	-.538	.396
Better Response to Bug Fixes and Support	4.32	.702	-1.147	.199	2.053	.396
High level of Inter-operability	3.89	.986	.061	.199	-1.674	.396
Maximum Shareability	4.44	.867	-1.239	.199	.193	.396
Ease of Deployment and Integration	3.95	1.163	-.829	.199	-.251	.396
Highly Useful in Providing Digital Library Services	4.39	.813	-.990	.199	-.279	.396

Table 3.2.12: Descriptive Statistics of Scale Variables

	Strongly Disagree		Disagree		Neutral		Strongly Agree		Agree	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Easy to Install and Register	4	2.7%	24	16.2%	20	13.5%	39	26.4%	61	41.2%
Maximum Level of System Security	0	0.0%	14	9.5%	22	14.9%	45	30.4%	67	45.3%
User Friendly for Front End Operations	6	4.1%	12	8.1%	34	23.0%	17	11.5%	79	53.4%
User Friendly for Back End Operations	1	0.7%	3	2.0%	27	18.2%	16	10.8%	101	68.2%
Easy Retrieval using Relevant Key Words	0	0.0%	0	0.0%	32	21.6%	64	43.2%	52	35.1%
High Level of Multilingual Support	5	3.4%	23	15.5%	17	11.5%	58	39.2%	45	30.4%
Great Scalability	0	0.0%	0	0.0%	11	7.4%	66	44.6%	71	48.0%
Good System Support and Documentation	0	0.0%	0	0.0%	30	20.3%	48	32.4%	70	47.3%
High Level of Compatibility	0	0.0%	1	0.7%	27	18.2%	68	45.9%	52	35.1%

Easy importing and exporting facility	0	0.0%	5	3.4%	29	19.6%	44	29.7%	70	47.3%
Better Response to Bug Fixes and Support	0	0.0%	5	3.4%	5	3.4%	75	50.7%	63	42.6%
High level of Inter-operability	0	0.0%	4	2.7%	69	46.6%	15	10.1%	60	40.5%
Maximum Shareability	0	0.0%	4	2.7%	25	16.9%	21	14.2%	98	66.2%
Ease of Deployment and Integration	6	4.1%	11	7.4%	34	23.0%	30	20.3%	67	45.3%
Highly Useful in Providing Digital Library Services	0	0.0%	2	1.4%	25	16.9%	34	23.0%	87	58.8%

Table 3.2.12.1: Frequency of Scale Variable

Regarding, 'Easy to Install and Register' to the digital library system, 66.7% either Strongly Agree or Agree that it was 'Easy to Install and Register' at the organization. However, 13.5 % kept Neutral on it. This was not supported by 18.9% of the respondents. Responding to the question about the system has 'Maximum level of System Security' was supported by 75.7% of respondents. This was reported Neutral by 14. 9 % and another 9.5% either Disagree or Strongly Disagree to this System is user-friendly for its front end operation is supported by 64.9 % and another 23% kept Neutral on it. This was not supported by around 12%. The 'User-friendliness of Back End Operations', 79% was Agreed or Strongly Aagreed to this compared to 18% who kept Neutral on it. This was not supported by around 3%. Easy retrieval using relevant key words is good according to 78.2% (Either Agree or strongly agree) compared to 21.6% who kept neutral on it. The system has high level 'Multilingual Support'. This was either Agree or Strongly Agree by 69.6% compared to 18.9% who did not support this. This was answered Neutral by 11.5%. 'Great Scalability' is there for 92.6% against 7.4 who kept Neutral on it. The Digital Library programme had good 'System Support' was opinioned by 79.7% against 20.3% kept Neutral on it. According to 81% the system had 'High Level of Compatibility'. This was not supported by only one respondent and another 18% kept Neutral on it. The system had easy 'Importing and Exporting' facility which is supported by 77 % compared to 19.6 who kept Neutral on it. This was Not Agreed by 3% of respondents. 'Better Response to Bug Fixes and Support' was Agreed or Strongly Agreed by 93.3%. This was answered Neutral by 3.4% and another 3.4% did not supported this. High level of 'Inter-operability' was opinioned by 50.6% of respondents and another 46.6% kept Neutral on it. This shows respondents may not understood this question. This was not supported by 2.7% of the respondents.

Maximum 'Share-ability, is there according to 80.6% of respondents. System was able to share data or functionalities. This was not supported by 2.7% and another 16.9 % kept Neutral on it. 'Ease of Deployment and Integration, was answered supportively by (either Agree or Strongly Agree) 65.6% against 11.5% who did not support this. This was kept Neutral by 23% . The system is 'Highly Useful in providing Digital Library Services' which was supported by 81.8% against 16.9% who kept Neutral on it. Only 2 respondents were not supported this.

4. RESEARCH HYPOTHESIS

A statistical hypothesis testing is used to determine whether an experiment conducted provides enough evidence to reject a preposition or not.

- H_0 Digital Library service is important in attaining the aims and objectives of the Library/ Institute according to the nature of organizations.
- H1: Digital Library service is not important in attaining the aims and objectives of the Library/ Institute according to the nature of organizations.
- *Dependent variable: Aims and objectives.*
- *Independent variable: Organizations.*

In order to test the hypothesis, a cross tabulation and Chi-Square goodness of fit procedure was performed and the result is summarized below:

Nature of the institution	Digital Library service is important in attaining the aims and objectives			Total
	Neutral	Strongly Agree	Agree	
Government	5	17	12	34
Private college/Institute Library	2	23	11	36
Commercial	0	2	0	2
Research Institute	1	48	7	56
Public Library	1	6	3	10
School Library	1	5	4	10
Total	10	101	37	148

Table 4.1: Cross-tabulation of the Nature of the institutions and Digital Library Service is important in attaining the aims and objectives of the Institutions

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.782[a]	10	.059
Likelihood Ratio	18.888	10	.042
Linear-by-Linear Association	.083	1	.773
McNemar-Bowker Test	.	.	.[b]
N of Valid Cases	148		

Table 4.1.1: Chi-Square Tests

The above cross related data shows that the Digital Library Service may be important in attaining the aims and objectives of Libraries/Institutes. Government Libraries, Colleges or Institutes and Research Institutes were the major categories supported this statement considerably and compared to Public Libraries and School Libraries. The significance of the relationship is explained using the Chi-Square Table. The Chi-Square test for independence, also called Pearson's Chi-Square test or the Chi-Square test of Association, is used to discover the relationship between two categorical variables. The significance of the relationship is explained in Chi-Square Goodness of fit table. When reading this table the study is interested in the results of the "**Pearson Chi-Square**" row. It is obvious that $\chi(1) = 0.17.782, p = .059$. This proves that there is no statistically significant association between different organizations on the opinion that the Digital Library Service is important in attaining the aim and objectives of Libraries/Institutes. For a statistical significance, the p value should be less than .05 (p=<.05) which means the researcher can be 95% confident that the relationship between the two variables is not due to chance. Here the p value is .059 which is very close or above the significant level. Therefore, the null hypothesis is rejected and accepted the alternative hypothesis that organizations are not considering digitization is not important in attaining the aim and objectives of their Libraries/Institutes.

5. FINDINGS AND CONCLUSION

Now a days, the library operations are no longer manual. With the help of Information Communication Technology, library data can be transformed in to electronically manageable

databases. This study focused to analyze the on-going digital library software programmes in the targeted libraries and its effectiveness for the digital archiving of the knowledge on medicinal plants of Kerala. It is hard to suggest one definite Digital Library Software Programme, which has all facilities and the most suitable for all cases. Each DL Software has it's own advantages and drawbacks, as stated in the following assessment. These evaluation can only be taken as a guidelines for determining a suitable Digital Library System according to the requirements of the library/institution.

The findings of the study is as summarized below:

- The most respondents who participated the study were from Research Institutes followed by Private Colleges/ Institute Libraries and Government Institutions (Table 3.2.1)
- The most widely used Software for Library Management is Greenstone followed by D space and e-Prints. (Table 3.2.2)
- 'Digital service is important in attaining the aim and objectives of the Library' was supported by 93.4 respondents. This shows the importance of digitization of valuable Medicinal Plant information to protect data from loss or damage. (Table 3.2.3.1)
- The current software which is used in most of the libraries have lots of limitations. The study revealed that most library staff experience difficulties in installation of software followed by too much time taking for installation. Requirement of more supporting software for the proper installation of the current software is another limitation pointed out by most respondents.
- Adding new data (Data Indexing) in the current software is difficult according to 75% of respondents. (Table 3.2.5)
- The current software had complexity for Importing or Exporting data. This is reported by 56% of respondents. Data comes in different format and sources. Importing data from other sources or exporting it to other programs are very important in modern software environment. This facility lack in the current software (Table 3.2.5)
- The current software is running under Linux platform in most of the targeted library systems. This shows that libraries are interested in using open source software like Linux to save money and independent customization. (Chart 3.2.6)
- The study found that most libraries use their own library staff to install and maintain the current software. External sources like Software companies manage the library system were few. (Chart 3.2.7 and 3.2.8)
- Materials used to build digital library according to a good number was the Images followed by the Metadata and Audio. (Table 3.2.9)
- Regarding the question of major changes carried out while implementing the present Digital Library Software, most respondents reported that there is no need of any changes.

The changes needed according to some respondents were significant changes in source code and adding new features. Minor changes like Style/Font/Logo or significant changes on user interface customization were reported by few respondents (Table 3.2.10).

- Regarding the provision of access to the digital library, the study found that, mostly it was granted to staff and students. Few libraries provide access to general public (Chart 3.2.11)
- When considering the overall performance and its use of the Digital Library, most respondents noted that it has a Maximum level of System Security, Good User Friendliness , Easy Retrieval using relevant Key Words, High Level Multilingual support and Great Scalability. (Table 3.2.12.1)
- Regarding the question of 'Digital Library service is important in attaining the aims and objectives of the Library/ Institute', the hypnotized table shows that organizations were different on its opinion on the statement. (Table 3.2.12.1)

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