Developing of Institutional Repository in Public Sector University Libraries of Punjab, Pakistan

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Abstract

The target of this analysis to discover the current status of open source institutional repository software's usage in the public sector university libraries of Punjab, Pakistan. Survey method was used by the researchers and a survey was adopted for information gathering. The target population of the investigation was library professionals of public sector universities in Punjab. Data was gathered from a sample of 135 university librarians using a convenience sampling approach. The analyses explored in which majority of library professionals have incorporated or are currently in the process of incorporating institutional repositories (IR) into their respective libraries which shows that library professionals are well aware about the importance of development/need of IR in this digital age. Further, this study revealed that most of the professionals preferred to use open source software i.e. D-Space for development of IR. Moreover, library professionals are of the view that IR software is a vital tool to organize the digital content/material. Further, IR software provides easy access to the users and enables them to provide efficient and effective services to their users.

Furthermore, this study highlights that majority of participants were preferred to use those software which have the facility of customization, E-mail based sharing of books. Library professionals are satisfied with that IR software which is freely available, provide format for conversion of different digital files, and publishing digital contents. The study also highlights barriers which faced by majority of respondents i.e. selection of proper software while developing the Institutional Repository. The respondents also ranked lack of budget is another

major barrier that forbade the development of IR followed by the selection of scanner technology, selection of material for digitization, institutional repository knowledge. The investigators will explore additional avenues for additional investigation through the lens of institutional repositories (IR).

Keywords; Institutional Repository; Open Source; Digital Library; University Libraries Punjab.

Introduction

The beginning of digital technology has significantly transformed the way in which educational institutions operate globally. With this new technological advancement, educational institutions are now able to efficiently collect and safeguard intellectual outputs, specifically, this exploration will focus on the realm of study, uncovering new prospects for future inquiries. Besides, term digital library refers enroot for a comprehensive assortment that arranges and preserves computerized resources and digital publications that can be accessed and obtained via cyber-net on the global network. This includes theses, dissertations, e-books, e-periodicals, snaps, statements, voices, records, or documentations that are managed by a personal study. Digital library software, which can either be non-proprietary or adapt software, provides a framework for the creation and exhibition of information collections. (Lithikar & Lithikar, 2012).

The developing countries often face major challenges when they come to access current literature and pay for it huge amount As a result, many libraries in these regions are unable to acquire the necessary journals. Additionally, research structure and the ability to take up experimental and practical facts tend to be lacking in developing countries, leading modest levels of outcomes from tests, which still need to be developed. (Islam & Akter, 2013).

During last ten years, many open-source software systems have been developed for hosting Digital Libraries (DL) and Digital Repositories (DR). Consequently, organizations now face the challenge of selecting an appropriate infrastructure to accommodate their collections (Pyrounakis, Nikolaidou, & Hatzopoulos, 2014). Although previous studies (Hossain & Islam, 2012) have focused on digital preservation, there has been a lack of attention given to the assessment of total library services. Several scholars (Tramboo, Humma, M Shafi, & Gul, 2012)

have explored the utilization of electronic library software for institutional repositories, with specific reference to open-source systems such as DSpace, EPrints, and Greenstone.

While there have been a few studies in Pakistan that explored the implementation and usability of DSpace interface (Safdar, 2021; Sharif, 2013), no comprehensive research has been performed enroot for look into the current condition of non-proprietary IRS adoption inside higher educational institutions, particularly in university libraries. Over the past ten years, a staggering digit of open-source computerized library as well as DR structures became formed, also disseminated. The variety of tool alternatives available to an entity looking to set up an archive to manage its items might be intimidating. This situation can cause confusion and make the decision-making process challenging (Pyrounakis and Nikolaidou 2014).

 "The phrase 'institutional repository' is often used informally to differentiate between systems and services to collect and disseminate scholarly content (peer-reviewed articles written by faculty, electronic theses, and dissertations) versus those systems and services supporting other types of digital objects" (Clobridge, 2010).

Problem Statement

In the Punjab region, many government funded university information centers are still waiting to implement DLS for the creation of institutional repositories, and several libraries are unaware of its availability. The use of non-proprietary electronic information center system and Institutional Repository (IR) systems present an opportunity for universities in Punjab to establish institutional repositories without any cost. OSDLS is a more cost-effective alternative to non-public library software. University libraries worldwide have increasingly adopted OSDLS for preserving institutional publications. While experienced information specialists are concerned about the installation process of repository software, they report being moderately more satisfied with OSDLS than with patrons of non- public library software.

The review of literature has found with the purpose of earlier research has concentrated on various aspects such as the practical implementation of particular open-source software (OSS) as Institutional Repositories, evaluations and comparisons of various IR packages, as well as library professionals' opinions and satisfaction with different aspects of IRs at a global scale,

there has been relatively little effort en route for make available comprehensive overview of the state in educational databases and to evaluate user satisfaction levels in university libraries.

While there have been a few studies in Pakistan that explored the implementation and usability of DSpace interface (Safdar, 2021; Sharif, 2013), no comprehensive research has been performed en route for discover the existing condition of non-proprietary (IRS) adoption within higher educational institutions, particularly in university libraries. Additionally, little emphasis has been placed on assessing the satisfaction point of both information managers along with library members in direction to institutional repository software. Therefore, intention of our research is to increase awareness among knowledge managers in addition to clients in Pakistani university libraries about the utilization of institutional repository software for preservation and distribution of information. It also aims to judge the satisfaction point of information mangers and library members regarding the online maintenance of academic outcomes to evaluate quality of presenting institutional repository software. Moreover, this study aims to identify important aspects, hurdles, and solutions for the integration of institutional repository software (IRS) to add its implementation and use in public sector university libraries of Punjab. As such, this research represents the foremost initiative to investigation the utilization in academic archives as well as contentment levels at government funded university libraries in Punjab, Pakistan.

Objectives of the Study

In the Punjab region, government funded university libraries are using digital library software to create institutional repositories. The purpose of this investigation is to examine the development, advancement, and current status and usage of institutional repository development software. It is vital to review the effectiveness and applicability of the academic archive system used in the public sector university libraries in the area. The primary objectives of this study are:

1. To determine the present status of open-source institutional repository (IR) utilized in Public Sector university libraries of Punjab.
2. To report the individual views of librarians regarding the utilization of institutional repositories in libraries.
3. To examine the opinions of librarians regarding the needed characteristics in institutional repositories.

4. To identify the benefits and satisfaction level of adopting open-source institutional repository in Public Sector university libraries of Punjab.

5. To understand the challenges faced by university libraries in using open-source institutional repositories (IR).

Research Questions

To guide the current investigation in line with the research objectives, the following questions were formulated.

1. What is the present status of the open-source institutional repository's activity in the university libraries of Punjab?

2. What are the personal views of librarians regarding the utilization of institutional repositories in libraries?

3. What are the opinions of librarians regarding the needed characteristics on which institutional repository software should be selected: based on their experience, qualifications, or designation?

4. What are the benefits and satisfaction levels of librarians about adopting open-source institutional repositories (IR)?

5. What are the difficulties and challenges faced by Public Sector university libraries in Punjab when using open-source institutional repositories (IR) based on their experience, qualification, and designation?

Literature Review

In a study, Khan and Bhatti (2017) analyzed instructional courses that were provided to university librarians in Pakistan to help them create and manage their online libraries. The results of this inquiry revealed that university the library staff in Pakistan only possess basic digital abilities when it comes to developing and managing electronic libraries, and that the development of digital libraries in Pakistan is still in its infancy.

A study was conducted to investigate the obstacles to digitization in Pakistani university libraries. The findings revealed that inadequate knowledge, lack of staff expertise, insufficient financial resources, unfamiliarity with new technology, non-existence of computerization

policies in addition to approaches were the primary obstacles to the implementation of digitization initiatives in Pakistani libraries (Rafiq et.al, 2018).

Rafiq (2022) discovered a study that IRs was still relatively new phenomena and had not been established as a necessary part of Pakistani university campuses physical infrastructure. Major barriers affecting the creation of IRs, were challenges of understanding, eagerness, inspiration, managerial assistance, abilities, funds, and teamwork. Someone suggested a framework for developing an institutional repository. For academics, vendors, university officials, and library executives, the study's conclusions have theoretical and practical value. They may also be applicable to other nations with comparable socioeconomic environments.

Kabir and Arslan (2022) conducted a recent study on institutional repositories (IRs) in 23 "Higher Education Commission" (HEC) accredited Islamabad's government funded and private universities. The analysis found that 17 universities had established IRs, but many were still in the development phase and had not fully implemented the software. Open-source software was the most popular choice among libraries. While librarians showed enthusiasm for using IR software, they faced barriers such as selecting appropriate software and digitization materials, insufficient resources allocated by the institutions, limited capacity building workshops, and a lack of trained personnel.

A study was conducted to detailing the circumstances for the conservation contents of the institutional repositories of "Swedish Higher Education" institutions over the long term. The study found that in many cases, for all the materials they hold, the institutional repositories in SHE organizations lack historical trustworthiness. (Francke and Gamalielsson, 2017).

Sanjeeva and Powdwal (2017) analyzed a study on how to implement open access (OA) in libraries of Mumbai. They suggested various measures that can be taken by the management to support OA, such as providing enhanced access to OA, digitizing OA works, initiating institutional repositories (IR), promoting the OA week, raising awareness, encouraging faculty, informing administrators, and more.

As Narayan and Luca (2017) conducted a study, which revealed that researchers faced challenges regarding use of institutional repository like investigators did not know of the value of accessibility to the public. The intellectual property policies of companies and the reputation of

scholars are likewise ambiguous. The institutional repository hosted by the library is not widely known or utilized, as well as the need for subject repositories, were identified as issues.

Anenene, Alegbeleye & Oyewole (2017) looked at a number of variables from the viewpoint of information experts that can help institutional repositories in institutions in "South-West Nigeria" become more integrated. Findings displayed that the bulk of responses were highly informed as well as positive views of IRs.

To gather and disseminate knowledge for library users, an analysis of three non-proprietary online librarianship programmes was carried out. Instructional documents along with associated technology files were compared as part of the investigation. Digital Library Management Software's implementation at DESIDOC was also discussed (Verma & Kumar, 2018).

Jabeen et al. (2018) conducted a research whose findings show because native freeware is highly valued in Chinese research centers and academic information centers, which heavily rely on paid programmes. The scenario could be brought on by a lack of expert expertise in freely available technology as well as a lack of adequate technical expertise. Despite the fact that the majority of librarians indicated interest in freely available technology, they declined to use it in their information centers. The study further revealed that the primary reasons for librarians' hesitation in adopting freely available technology were the risk factor, inadequate professional expertise, lack of interest on the part of the Chinese state and insufficient expertise.

Libraries faced new challenges in the information society and using free technology to manage libraries can help you save money. This report explored the definition and characteristics of non-proprietary information center managed technology, as well as the best freely accessible technology choices according to requirements, advantages, and disadvantages. It also describes the functionality of various management software that's "Greenstone Digital Library", "DSpace", "KOHA", "E-Prints", and "NewGenlib", which are effective in developing online information centers and educational archives (Jahina & Batcha, 2018).

Ukwoma, Osadebe & Dim (2019) examined the administration of institutional repositories (IR) in Nigerian colleges. Outcomes of this investigation indicated which a large number of scholastics submit this research under documentation of IR, that the items provided are typically journal entries as well as meeting procedures. The substance is documented,

utilizing self-filing and intervened accommodation. A few colleges do not offer help and inspiration towards the examination works of their staff.

In an empirical study, findings disclosed that Uganda is currently in the process of developing a policy for the integration of Open Source Software (OSS). The policy is being formulated for various reasons, encompassing economic, social, political, and academic benefits. This move towards OSS adoption is significant as it can provide cost-effective alternatives for countries with limited financial resources, and can also have wider societal and academic benefits (Muwanguzi and Musambira, 2019). Katsamakas and Xin (2019), the decision of an organization to adopt Open Source Software (OSS) is influenced by several factors. These include the organization's IT skills, the potential network impacts, and the compatibility of OSS with the specific application requisites of the organization. The study's findings hold relevance for officers and lawmakers who are engaged in coming to decisions regarding OSS adoption in their respective organizations.

Ahammad (2019) executed a recent experiment explored the use of "DSpace" programme in a Bangladeshi library, demonstrating how it promotes the "open educational resources" (OER) action within institutes of learning. The study emphasized the freely available technology's importance as well as Institutional Repository (IR) software in promoting OERs. It recommended the use of DSpace in libraries due to its low cost and easy to use attributes, especially in developing countries. The study highlighted the critical role played by libraries and librarians in promoting OERs through the implementation of Open Access (OA) and Digital Library (DL) software, with DSpace being a major OSS contributing to the distribution of OERs worldwide. The study suggested that librarians are essential figures in this movement, as they operate most of the repositories worldwide, making OSS the lifeblood of the OER movement.

The country's repositories have grown slowly, and the majority of their contents i.e. theses, research papers, and publication. Whereas research disclosed Nigerian universities' shortcomings in examining the possibilities of institutional repositories in improving and expanding the publicizing of their research-based outcome, It also calls for the development of a long-term strategy by the states along with various organizations towards an increase of repositories. (Ejikeme & Ezema, 2019). Islam (2019) conducted a study that non-proprietary

electronic information center technology with an IR instrument has produced fresh prospects to assist financially strapped colleges, toward formulate as well as retain IRs. Freely accessible electronic library programme is more inexpensive than non-free system. In this manner, college libraries universally will generally proceed to the reception in favor of safeguarding of organization distributions. The findings revealed which several investigations have looked at the perspectives and practical experiences of administrators upon the reception for library programmes.

Lenarduzzi et al. (2020) disclosed an organized study examined the current research interest in the topic of open system software (OSS) selection and identified the factors that stakeholders consider when choosing an OSS. The study also analyzed the obtainable OSS assessment processes, highlighting their respective strengths and limitations. It provided valuable insights into the continuing relevance of OSS selection and offers a whole summary of the assessment processes currently available. Most of the libraries manage institutional repository using Dspace. It is also revealed that IR usage in public universities is just 13%. The majority (83%) do not keep any repository software updated, whether it's open source or customized. The institutional repository is not available due to issue of power supply and server. Some public institutions are lacking experts to manage the institutional repository (Islam, M. et al., 2020).

Ifeanyi et. al (2020) concluded that there is no way to emphasize the advantages of IR. Unfortunately, Nigerian universities are still having difficulty in overcoming the numerous difficult problems. In underdeveloped nations like Nigeria, institutional repositories which serve as digital libraries and content repositories are still largely in the planning and implementation phases. A useful tool for efficient scholarly communication is IR. In Nigeria, its capability is limited by a lack of ICT resources for deployment, inadequate technological expertise, an unstable power supply, a lack of funding, among other factors. The solutions to these problems include sufficient funding, training and retraining for librarians, raising stakeholder awareness, and increasing bandwidth and power.

In this findings looked into the usage of "open-source software" with the creation of IRs. Researcher's findings suggest that OSS, which are "Dspace" and "Eprint", it's frequently utilized in India to create IRs. Furthermore, OSS is extremely beneficial and affordable in the

development of IRs. The majority of IRs is being produced in topic domains such as science and technology, as well as health and medicine (Gurikar and Hadagali, 2021). Barrueco and Termens (2021) probed the electronic conservation approaches employed in the development of Institutional Repositories (IRs) across various European countries. The findings indicated that many repository administrators have not prioritized the prolonged existence of the digital resources they store. Instead, their attention has been directed towards other issues. The study also highlighted that IRs, given their extensive collection of research publications, can serve as an excellent source for digital preservation purposes.

Adam & Kaur (2021) found in their study as numerous associations, groups, and entities aim to encourage free-of-charge adoption across Africans. Although it continues to progress slowly for academic archives to be widely used, the performance of the established repositories fell short of expectations. Based on the existing situation, recommendations were made for getting African institutional repositories back on track. African nations' involvements in the free-of-charge initiative as well as their current state of performance were emphasized. The comparatively small shortage of operating archives serves as a wake-up call for African countries as well as the state to intensify actions in both was creating new IRs and maintaining those that have already been built. The findings show that a large number of IRs does not necessarily translate into great performance. Institutions must establish a public presence, as South Africa has done. In this study, when the cost of enhancing quality of the software is low, the presence of open-source software may affect the cost and quality of the proprietary developer relative to the monopolist Zhou and Choudhary (2021).

In this investigation that Institutional repositories are a crucial subject that can serve considered an encouragement to bring about transformation within universities including all scholarly endeavors they support. IRs provides scholarly material to users in order to improve communication among them. An academic depository refers to an electronic depository enabling collecting, conservation, as well as publicizing an institution's cognitive outcome. Institutional repositories have had a significant impact on library patrons and meeting scholarly information needs. And we can see examples of IRs as well as basic information about the top three IRs available for open access around the world (Padval & Thakare, 2022). Prasetyo & Marwiyah

(2022) explored that all levels of decision makers in the institution are committed to execution of the academic depository. Librarian's role with expertise in documentation science is critical to the institution's commitment to establishing an institutional repository. Great information technology support is required because the content being disseminated is digital content, as well as support from all components of the academic community in filling out the institutional content standard format repository.

This study indicates that an increasing number of information centers now implementing free-of-charge system, but the rapidity developing among female libraries is lower. According to the study, women are not slowing down behind because of their qualifications or a particular expertise, however due to all further commitments, such as familial commitments, generate a job and private life balance mismatch, causing them to refrain from taking many risks and instead try to improvise within set parameters. According to the survey results, if employers provide a risk-free atmosphere for women library professionals, utilization of free-of-charge programme may accelerate (Khan, 2022).

Friday (2022) discovered that To overcome challenges related to conserving e-theses and dissertations in libraries, various strategies have been identified as effective, including creating a digital conservation strategy, joining in personnel innovation projects, forming an academic depository, signing agreements, attending ongoing learning, collaborative working, society involves judgment, administrative judgment, and inviting expert advice. However, strategies such as franchising ICT/finances and advocacy have been found to be ineffective.

Nawakaego (2022) identified the procedural tasks in the IR development at Kenneth Dike Library (KDL) that included strategic project planning by UI library management, seeking and obtaining university management approval, implementing an in-house approach to IR digitization and management, and ongoing digitization processes. Finally, the study identified some issues and solutions in the management of the University of Ibadan IR project that could be useful to institutions that have yet to establish IRs. In the end, the researcher suggested that It is necessary to have a written IR policy, as well as more awareness programmes, to sensitize the university community on IR and ensure adequate support and contributions from stakeholders.

Kari and Orji (2022) investigated that Institutional repositories are a challenge which Nigerian universities have not yet taken seriously. There are hardly many functioning academic depositories at Nigerian academic institutions. The researchers proposed that the management of libraries should train students and employees about the need of supporting institutional repositories, and training sessions for library personnel should be planned so that they have the skills necessary to maintain institutional repositories. In the end, researchers indicated which academic depositories ought to have enough funding.

Research Method

Choosing an appropriate research technique to achieve the research goals is a fundamental aspect of the research process. According to Powell (2006), the survey method is a suitable and appropriate approach for research in the field of librarianship. The literature review indicates that previous studies, including those by Nagaraju (2015) and Tella & Oyedokun (2014), have effectively utilized survey methodology and quantitative research process in achieving their research goals.

Population and Sampling

The term "population" refers to a group of individuals or a collective group being studied. According to Powell (2006), this acronym "population" refers "any set of individuals or items that owns at least one mutual characteristic". The intended population for this present study consisted of library staff employed at government funded universities in the Punjab province. The data collection from the target population was performed through the utilization of convenience sampling, which is a non-probability technique. "Sheble and Wildemuth (2009)" explained that approaches for random testing do not provide each contributor in the population with a same possibility of selection. The researcher used this kind of sampling due to the scattered population in Punjab. In several research analyses, a sample is a smaller portion of the society under consideration. According to Goode and Hatt (1952) "sample is the representative of whole population of the study". There were 200 librarians of 49 public sector universities in Punjab, Pakistan. Using the Taro Yamane formula (Yamane, 1967) with ninety-five percent of probability and a five per cent margin of error, the sample for this investigation was determined. The calculation of sample size by using the formula of Yamane was following:

$$n = \frac{N}{1 + N(e)^2}$$

In formula:

n = sample size

N = total number of population

e = Margin of error (%)

$$n = \frac{200}{1 + 200(0.05)^2}$$

n = 134 (Rounded)

The sample size of the study was determined to be 134 librarians after applying the formula and inputting the required values.

Data Collection Tool

This was a quantitative study. According to Blaxter (2010), the questionnaire is the best instrument to collect the data from huge and scattered population. Rea and Parker (2005) postulated that one of the advantage of the questionnaire method is that it can be administered in other communities or within the same population after a few years. Rea and Parker (2005) argued that a questionnaire is a tool which is used often by different researchers when they have a huge population.

Hence, a structured questionnaire method was designed with the research objectives in mind. The development of the questionnaire was established on a thorough review of the literature. The questionnaire was reviewed and revised multiple times with the guidance of the research supervisor. After receiving feedback, the first draft of the questionnaire was created. Expert review is obligatory to check the content validity of the questionnaire. To gather important insights, the experts were asked to provide feedback on the initial questionnaire. Experts who were chosen have extensive experience, recognized professional reputation, and participation in public university library projects and college. The quality of the questionnaire was enhanced by incorporating valuable recommendations from the experts.

Data Collection

The questionnaire was sent to librarians through online medium to serve as the initial step in the data gathering process whose were working in different public universities of Punjab. It was also followed up time to time. As mentioned above there were 200 librarians of 49 public sector universities of Punjab. The researcher personally visited the participants offices for obtain the data. Further, the researcher approached the target population via mail, WhatsApp and other social media channels to collect the maximum data.

Data Analysis and Interpretation

The collected data was entered into SPSS version 22 software. Different codes and numbers were allotted to questions. Frequency was calculated to check the developing of

institutional repository of public sector universities libraries of Punjab. Gathered information put in software that was a "Statistical Package for Social Sciences" (SPSS 22.0). Statements used descriptive statistics and demonstrated the result section wise.

Analysis of Demographic Information

The results of Table 1 present that 94 (69.6%) of total 135 (100%) participants were male and 41 (30.4%) were female, while that majority 80 (59.3%) of total 135 (100%) participants

have qualification M.Phil, while 44 (32.6%) had MLISc/BLS and 11 (8.1%) had PhD qualification. The table also showed that greater part of the respondents 41(30.4%) were working from 11-15 years and 33 (24.4%) have 16-20 years experience, while 28 (20.7%) participants have over 20 years experience, 23 (17.0%) have 6-10 years experience and 10 (7.4%) have 1-5 years experience in the field of Library Science, further majority 67 (49.6%) of total 135 (100%) participants were Librarians, while 27 (20.0%) were senior librarians, 19 (14.1%) were assistant librarians, 9 (6.7%) were deputy chief librarians, 8 (6.7%) were deputy librarian and 5 (3.7%) were chief librarians.

Table 1

Parameters	Frequency	Percentage
Gender		
"Male"	94	69.06
"Female"	41	30.04
Professional qualification		
BS/MLIS	11	8.1
MPhil		
PhD	80	59.3
	44	32.6
Professional work experience		
Over 20	28	20.7
16-20	33	24.4
11-15	41	30.4
6-10	23	17.0
1-5	10	7.4
Designation		
"Chief librarian"	5	3.7
"Deputy chief librarian"	9	6.7
"Deputy librarian"	8	5.9
"Senior librarian"	27	20.0
"Librarian"	67	49.6
"Assistant librarian"	19	14.1

Use of IR Software

The findings of Table 2 indicated that 58 male and 32 female were responded "Free & Open Source," while a significant amount of participants 39 people opted out, whereas 3 male participants were responded "Locally Developed" and 1 male and 1 female participants were responded "In-house developed" and 1 male participants was responded "Commercial software."

Table 2

Use of IR Software (N=135)

Use of IR Software	Male		Female		Total
	Frequency	Percentage	Frequency	Percentage	
Locally Developed	3	4.76	0	0	3
Free & Open Source	58	92.06	32	96.96	90
In-house developed	1	1.58	1	3.04	2
Commercial software	1	1.58	0	0	1
Total	63	100	33	100	96
No Opinions					39
Total		135		100.0	135

Use of Different Type of IR Software

The findings of Table 3 indicated that 47 male and 24 female respondents were responded "D-Space," while a high number of respondents 50 were not used whereas, 05 male and 02 female participants were responded "Greenstone" and 04 male and 02 female participants were responded "Calibre" and 1 male and 0 female participants were responded "E-Prints" and 0 male and 1 female participants were responded "Fedora Commons."

Table 3

Use of different type of IR software (N=135)

Type of IR Software	Male		Female		Total
	Frequency	Percentage	Frequency	Percentage	
Calibre	04	7.01	01	3.75	05
E-Prints	1	1.75	0	0	01
Fedora Commons	0	0	01	3.75	01
D-Space	47	82.45	24	85.71	71

Greenstone	05	8.77	02	7.14	07
Total	57	100	28	100	85
No opinions	50				
Total		135		100.0	135

Gender Views Regarding Use of Institutional Repository Software in Public Sector University Libraries of Punjab

A separate t-test conducted to test the difference between opinions of male and female respondents regarding development of Institutional Repository. The results reports that female participants (*M* = 4.1572, *SD* = .42526) preferred to develop IR as compared to male, regarding the use of IR female participants (*M* = 4.3377, *SD* = .35632) preferred to use IR in this digital era, regarding traits of IR software female (*M* = 4.1911, *SD* = .57145) like to use the those software which have distinct features/traits, regarding satisfaction with development of IR software female professional (*M* = 4.1626, *SD* = .36729) were more satisfied as compared to male. As far as challenges is concerned, female respondents faced more challenging environment as compare to male participants. However, t-test results showed no significance difference in opinions between male and female participants.

Table 4

Statements	Mean		t-value	Sig. (2-tail)	Std. Deviation		
	Male (94)	Female (41)			Male (94)	Female (41)	df
Views about the use of IR	4.0912	4.1572	-.553	.581	.71043	.42526	120.106
Traits of IR software	4.2201	4.3377	-1.248	.214	.55483	.35632	114.339
Satisfied with developing IR Software	4.1170	4.1911	-.573	.568	.73556	.57145	96.931
Challenges	4.0397	4.1626	-1.109	.269	.66547	.36729	125.707

Significance Level*<.05; Sig. (2.tail) = P-Value

Professional Experience Views Regarding Using of Institutional Repository Software in Public Sector University Libraries of Punjab

The impact of professional experience was examined using a one-way assessment of deviation regarding development of institutional repository in public sector universities of Punjab, Pakistan. There were three groups based on their professional experience (Group 1=over 15, Group 2 = 11-15, Group 3 = 1-10). The analysis found no statistically significant variance among respondents' perceptions based on various work experiences groups about the use of IR according to one-way ANOVA (F (2, 132) = 1.140, p = .323). Whereas, findings showed the opinions of various professional experience groups did not differ quantitatively significantly regarding traits of IR software with respect to one-way ANOVA (F (2, 132) = .282, p = .754). However, findings showed that there were no numerically noteworthy variations in respondents' perceptions of various professional experience categories regarding satisfied with developing IR software based on one-way ANOVA (F (2, 132) = 2.023, p = .136). In the last, findings showed the Analysis revealed that opinions among different professional experience groups did not differ statistically substantially regarding challenges of IR software according to one method ANOVA (F (2, 132) =.798, p = .454).

Table 5

		N	Mean	Std. Deviation	Std. Error	Maximum
Views_about_the_use_of_IR	Over 15	61	4.2022	.37707	.04828	5.00
	11-15	41	4.0329	.70068	.10943	4.89
	1-10	33	4.0404	.88751	.15450	5.00
	Total	135	4.1112	.63655	.05479	5.00
Traits_of_IR_software	Over 15	61	4.2919	.26678	.03416	4.77
	11-15	41	4.2242	.55782	.08712	4.85
	1-10	33	4.2284	.73398	.12777	4.88
	Total	135	4.2558	.50447	.04342	4.88

Satisfied_with_developing_IR_Software	Over 15	61	4.2632	.50775	.06501	4.94
	11-15	41	4.0827	.77531	.12108	4.94
	1-10	33	3.9815	.83167	.14478	4.94
	Total	135	4.1395	.68859	.05926	4.94
Challenges	Over 15	61	4.1410	.42810	.05481	4.93
	11-15	41	3.9902	.72381	.11304	4.87
	1-10	33	4.0667	.67309	.11717	4.87
	Total	135	4.0770	.59231	.05098	4.93

Table 6

		Sum of Squares	DF	Mean Square	F	Sig.
Views_about_the_use_of_IR	Between Groups	.922	2	.461	1.140	.323
	Within Groups	53.374	132	.404		
	Total	54.296	134			
Traits of_IR_software	Between Groups	.145	2	.073	.282	.754
	Within Groups	33.956	132	.257		
	Total	34.102	134			
Satisfied_with_developing IR_Software	Between Groups	1.890	2	.945	2.023	.136
	Within Groups	61.646	132	.467		

	Total	63.536	134			
Challenges	Between Groups	.562	2	.281	.798	.452
	Within Groups	46.450	132	.352		
	Total	47.012	134			

Findings and Discussion

The study discovered that librarians/information specialists had an optimistic view on use of non-proprietary institutional repositories and they were well aware about the importance of open-source institutional repositories OSIR. Most of the libraries are using "D-Space" for development of IR followed by Greenstone. Library users are more depending on digital contents, due to its usability, 24/7 availability of digital information, and advance searching options to retrieve the relevant information. A separate sample t-test was applied to assess each library professional's variances on the views of librarian, using institutional repository software in information centers by designation and qualification. The results revealed that chief librarians and librarians significantly agreed that "library users are more depending on digital contents" in this digital era. However, library professionals holding PhD/M.Phil and MLIS/BLIS qualifications significantly agreed that "IR software gives advance searching options to retrieve the relevant information" to the library users.

Library professional preferred to use those software which have the facility of customization, e-mail based sharing of books, web based software, having provision of online up-gradation, availability of software manual, facility of conversion of digital objects in different formats, having facility of powerful searching & retrieval and web language support. Additionally, a t-test conducted independently also used to examine whether there were any differences in participants' attitudes between each gender, by designation and qualification. The results revealed that male & female and the participants holding PhD/M.Phil and MLIS/BLIS degrees significantly agreed that "online up-gradation" is a needed trait of IR software in this

digital era. However, the chief librarian and librarian significantly agreed that "free technical support" is a needed trait in IR software.

Majority of the participants preferred the IR software which are freely available, provide format for conversion of different digital files, publishing digital contents, assigning/editing metadata, affordability to acquire and implement institutional repository software, installation process, searching & browsing (options), and provide customization facility.

Library professional were of the view that "selection of proper software", "lack of budget" "selection of scanner technology", "selection of material for digitization", "institutional repository knowledge", "preservation of digitized contents", "the use of use of metadata standard", "developing sustainable budget", "lack of technical skills", "inadequate training opportunities", and "acquiring technical support from the university IT department" are major barrier for development of IR in this digital era.

A t-test conducted independently also used to examine whether there were any differences in participants' attitudes between each gender. The research did not identify any notable disparity in the viewpoints of both categories of participants regarding the utilization of institutional depository software public sector university libraries of Punjab Pakistan.

To investigate the impact of a library professional's professional experience, the one-way assessment of variation w.r.t. developing institutional repository in public sector universities of Punjab. The analysis expressed that the opinions of various professional experience groupings did not differ quantitatively substantially regarding views of librarians regarding the use of IR software in information centers, needed traits of IR software, satisfaction of library professional with IR software, and challenges for libraries in using IR software.

Conclusions

The study explored that majority of library professionals created and implemented IR within the institutions, and implementation is under progress which shows that library professionals are well aware about the importance of development/need of IR in this digital age. Further, this study showed that majority of the professionals preferred to use open source software i.e. D-Space for development of IR. Moreover, library professionals are of the view

that IR software is a vital tool to organize the digital content/material. Further, IR software provides easy access to the users and enables them to present efficient and effective services to their users.

Furthermore, this study highlight that majority of participants preferred to use those software which have the facility of customization, e-mail based sharing of books. Library professionals are satisfied with that IR software which is freely available, provide format for conversion of different digital files, and publishing digital contents. The study also highlights barriers which faced by majority of respondents i.e. "selection of proper software" while developing the Institutional Repository. The respondents also indicated that the "lack of budget" is another major barrier that forbade the development of IR followed by the "selection of scanner technology", "selection of material for digitization" and the "Institutional repository knowledge".

Recommendations

The conclusions derived from this study prompt the following suggestions/recommendations:

1. The executive bodies of public sector universities must arrange some training workshops for library professionals to become aware with IR software and encourage them to implement the same in their libraries.

2. The administration of the respective universities should increase budget allocations for subscription/purchase of IR software and related to allied expenditure.

3. The public sector universities where library science is being offered may revise its curriculum according to market need.

4. In order to enhance the implementation/development of IR, group/practice base activities need to be structured in universities curriculum.

5. The management of universities should enhance their ICT infrastructure to facilitate the accessibility of digital content, thereby creating a supportive and amicable learning environment with speedy internet connections.

6. Public Universities should develop policies and guidelines for the integration of more ICT based systems in libraries.

7. A consortium may kindly be established by the public functionaries at national level regarding development of IR software.

8. Professional staffs that have extensive experience of Information Technologies may kindly be hired by the Universities to better serve the library patrons within this digital era.

9. In order to enhance the digital collection, Faculty members, researchers and students may be encouraged to deposit their digital contents, books and research work to the libraries.

Topics for Future Research

1. The current research organized on province level; an additional investigation may be conducted across all Pakistan.

2. The present research was conducted exclusively by public sector university librarians; a further study may conduct on private universities, colleges and special libraries.

3. To investigate or to explore the status of development of IR in libraries; this kind of study ought to be conducted on an extensive scale with different population like School, Public, Special libraries in Punjab or in Pakistan.

4. A comparative study of public and private sector universities may also be conducted in order to ascertain the status of IR.

5. Effect on Institutional Depository method towards conserving the organizational resources.

6. Assessment of online library programme and patron satisfaction in university libraries of Punjab.

7. This study can be replicate after five years.

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