Technical Staff Positions and Technology related Tasks: A Study of University Libraries in Pakistan

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This study investigated the current state of technical staff positions in the central libraries of leading universities in Pakistan. Multiple quantitative methods were adopted to carry out this study. Quantitative data about technical staff positions were retrieved from organizational documents such as service structure documents, organizational charts and budgetary documents. Principal author carried out quantitative observations and informal discussions with library executives in order to measure the levels of working of technical staff positions and alternatives adopted by libraries to carry out technical tasks. This study found that fifty percent of the libraries have not created any technical staff positions and automation related tasks are being performed by library professionals with the cooperation of vendors who have provided the library software. Of the nine positions for technical staff sanctioned by the libraries, only two were found to have been filled. Centralized mode of operation has been adopted for technical staff personnel. Only one library has given the additional charge of section head to the technology expert who is also managing technical tasks at organizational level.

Keywords: Technical tasks, technical staff positions, line personnel, university libraries.

Introduction

Application of technology in libraries is increasing at a very rapid rate and most of the library operations are being automated and mechanized. The entire library landscape has been revolutionized due to the developments in information and communication technologies, and adoption of internet (Khan and Bhatti, 2012). Well before the start of the current century, Hoadley and Corbin (1990) predicted that libraries in the future will contain audio-visual material and electronic files for providing enhanced access services and tools to library users.

As a result of the technological advances, libraries started the creation, access and delivery of digital or electronic resources. The world of information and libraries is transforming rapidly and more digital information is being produced and delivered electronically over the internet (Jaswal, 2016). Organizational content has been transformed into digital form and institutional repositories have been established to provide access to digital content (Carver, 2010) through creation of websites. Access to print and electronic resources is mainly dependent on the automation of library operations and creation of OPAC has become necessary to enable library users to search required material (Khan, Zahid & Rafiq, 2016).

Higher Education Commission of Pakistan (HEC) established IT infrastructure in the public and private sector universities and degree awarding institutions in Pakistan. Pakistan Education and Research Network (PERN) enhanced communication infrastructure, HEC National Digital Library provided access to peer reviewed research, Pakistan Research Repository (PRR) gave free access to PhD theses, and E-library ensured free internet access and computers (Rafiq & Ameen, 2014; Warraich & Tahira, 2014). World scenario and

initiation of information technology initiatives in Pakistan have strong influences on libraries. Libraries and particularly academic libraries in Pakistan have adopted information technology to carry out library operations. Rafiq and Ameen (2014) found that university libraries in Pakistan are digitizing print resources to offer online access and meet the information needs of users. Different authors have examined the nature and characteristics of web technologies being used in libraries (Arif & Mahmood, 2012; Ganaee & Rafiq, 2016; Qutab & Mahmood, 2009). Many studies have investigated the features of library software used for automation in Pakistani libraries (Haider, 1998; Mahmood, 1996; Rafiq & Ameen, 2009; Shafiq & Mahmood, 2008; Ramadan and Singh, 2009).

Developments of websites, digitization, emergence and use of web and automation of library operations have brought enormous opportunities and challenges for the libraries. Digitization, automation and web are technical and difficult tasks. Libraries can tap into the potential of these technologies if the library personnel have adequate technical skills. Library staff having a background in library and information science can be trained to enhance their expertise enabling them to effortlessly fulfill the future information managers' roles such as cyberian, metadata professional and information navigator (Iqbal, 2012). According to Khan, Zahid and Rafiq (2016), the successes of library automation is dependent on "the ability of professional staff to facilitate and implement the process". Library professionals should be encouraged to perform technology related tasks (Ali & Rehman, 2012) by arranging regular training sessions for them.

Another approach may be adopted to manage technology related tasks in libraries. Individuals having a formal education in computer science or information technology who possess technical expertise can be recruited to perform technology driven tasks and responsibilities. Technology related functions can be entrusted to different library personnel according to their qualifications and expertise. Technical staff supports the technical operations and mechanical processes of the library by operating technologies that are part of the library environment. Technical staff in libraries can help library professionals in matters such as library automation, digitization of library material, networking of computers, creating connections with users via social media and maintaining web sites of universities. Major responsibilities of the technical staff in the library are to manage and support the technical operations in the library by carrying out automation, developing library web pages and creating connectivity in the entire library network.

By taking into account the growing use of technology in libraries, this study investigated the current state of technical staff positions and the alternatives adopted by university libraries in order to carry out technology related tasks. Furthermore the level in the library operational hierarchy at which the technical tasks are being performed by technical staff personnel was also investigated. Hierarchical status of line positions of library professionals who are doing these technology related tasks has also been discussed. This study will help university and library administrations to understand the need of technical staff in the library to manage technology related tasks more efficiently. It will raise awareness among library professionals about the role that technical staff positions can play in the mechanization of library operations. A correct balance can be created between technical staff positions and line staff through identification of different combinations of staff positions and their alternatives for proper management of technical library operations.

Line positions and Staff positions

As an organization expands and grows larger, the manager's job becomes more complex and staff positions are created to give special and technical advice and assistance to the line managers in technical and support matters. Staff positions are subordinate to line positions as line officers are identified as administrators and managers who perform core library operations while staff positions are identified as specialists or experts.Line positions have the main responsibility of designing, developing, producing and delivering products and services to the users. Line positions in the library directly contribute to the objectives of the library by performing core library operations, while staff positions provide expertise and support to main library operations. Staff personnel provide expertise and support to line personnel

allowing them to create and deliver value and services to users. Etzioni (1959) has described two approaches to define the relationship between staff and line positions. According to the first approach, staff officers provide advice only to the line officers; while in the second approach they can take part in selective operational activities.

Ugbomhe (2011) emphasized that the line positions are based on simple hierarchical relationships in a direct chain of command. Authority flows from the highest level executive to the lowest level for performing operational responsibilities within the organization. In line positions' hierarchy, each individual reports to an immediate supervisor and responsibility for performing different tasks is clearly defined in the library hierarchy. According to online business dictionary, line position is defined as "job position within a chain of command of an organization that has the responsibility for decisions involving the use of the organization's resources to generate revenue and to achieve its other objectives".

Staff positions are created to provide support and assistance to either the whole organization or different sections of the organization. In a library they are directly under the control of the head librarian. According to McCann et al. (1990), library administration and governing boards consider non librarians as staff positions and these positions play "a major role in the continuity and stability of library programs". Online business dictionary has defined the staff position as a "job position within a chain of command of an organization that has the responsibility of providing information and advice to personnel in the line position". Staff positions not only perform an important support role in the library but also act as a bridge between the library and other stakeholders such as the parent institution and users.

Staff positions vary according to the nature of expert advice they provide. Staff positions can be further categorized into different sub categories, such as support staff, administrative staff and technical staff. Support staff helps in managing day to day library tasks that have limited complexity. The support staff in a library includes library assistants and attendants who help line staff with complex tasks and responsibilities in performing core library operations. Administrative staff helps in managing the office work and provides help to library administration engaged in preparing budgets and establishing future plans by performing typing, filing and other office related duties. Staff positions which help in managing e-resources, tackling mechanization issues and solving trouble shooting issues are considered as technical staff positions. Database administrators, computer specialists, computing officers and web developers are examples of technical staff positions.

Literature Review

Many studies at the national and international level have thrown light on different aspects of line and staff positions in library and information centers. No comprehensive study on technical staff positions in academic libraries in Pakistan has been conducted to date. However, certain aspects of technical positions in Pakistani libraries have been discussed by some local authors. These studies revealed that library professionals should learn technical skills but have not advocated that libraries should create distinct technical staff positions to cope with the technical requirements of the current digital era. National and international studies are narrated separately in this section.

National studies

Haider (2004) has reported that the lack of competent and qualified staff (line positions) in university libraries in Pakistan is attributed to the brain drain of professionals to Middle Eastern countries. "Only two out of forty-five public sector university libraries at present are headed by full-time professionally qualified librarians" and all other libraries either had a deputy librarian or an assistant librarian at the helm. Furthermore in two university libraries the university LIS department had assumed this responsibility. The situation regarding the administrative staff (staff positions) working in the libraries was also found to be unsatisfactory. It was reported that the administrative staff "did not make efforts to keep themselves abreast with the developments taking place in the library world". Particularly, the introduction and adoption of information technology in libraries was being ignored.

According to Ahmad (2008), staff positions have been

created to conserve and preserve the library material and to automate it at the National Library of Pakistan. The current head of conservation and preservation section holds a Master of Science degree in Chemistry and the system analyst is Master in Information Technology. He expressed reservations that non library professionals are heading these important sections of the library. Ali and Rehman (2012) asserted that library professionals can better manage the knowledge organization if they are entrusted with the task of assigning words or phrases to best describe a document in the integrated library management system. They can implement the work in the automation system by providing different access points to the users for easy retrieval.

Khan and Bhatti (2012) conducted a qualitative study and data analysis indicated that the library profession has been revolutionized due to the emergence of new information and communication technologies, internet, and the World Wide Web. They advocated that library professionals (line staff) should equip themselves with "greater skills and capabilities to survive and thrive in this new digital environment" and to perform the technical work more efficiently. They found that librarians suffer from a lack of technical skills and advocated that library professionals should make an effort to learn these skills in order to effectively and efficiently perform technical library operations. They further recommended that LIS curricula should be revised and restructured to address the development of these technical skills in young professionals enabling them to better perform their jobs in the digital era.

Mustafa and Ansari (2013) opined that as a consequence of the evolving information age, a library professional is being referred to as a cyber-librarian, library technologist, digital librarian and IT manager. They further identified the perceptions of library professionals about required computer skills of library professionals such as program languages or library database administration. Such technical library tasks can be effectively performed by library professionals by learning technical skills or by recruiting technical personnel.

Rafiq and Ameen (2014) proposed staffing pattern for managing digitization work in university libraries in Pakistan. They proposed that library professionals should be trained in library related tasks and also induct library staff having needed digitization skills. They found that the majority of library professionals "felt insecure from IT professionals and feared that they might replace librarians in future". But few recommended that IT specialists might be recruited and placed under library head for technical and system support.

International studies

McCann et al. (1990) have described the restructuring plan of Medical College of Georgia's Robert B. Greenblatt, M.D. Library which was intended to "devise a structure of library staff positions that becomes progressively more demanding". This plan helped in enabling the personnel to improve their skills and to qualify for higher positions. Eichinger and Lombardo (1990) stated that personnel working at staff positions are unable to develop leadership competencies as compared to those working at a line personnel position. They also described twenty-two ways to develop leadership among personnel working at staff positions.

Gremmels and College (2013) studied the different ways being employed in staffing college and university libraries. They identified that front-line reference service work was being shifted to paraprofessionals (staff positions) and student workers, and technical services and clerical work (staff positions) was being "eliminated, automated, outsourced, and consolidated consortially". They further found that some academic libraries had also recruited non librarians (staff positions) and staffing patterns of libraries were changing with the adoption of new technologies.

Objectives of the study

This study was conducted to achieve the following objectives:

1. To identify the current state of technical staff positions in central libraries of leading universities in Pakistan.
2. To investigate the levels of operation of technical staff positions adopted by university libraries.

3. To examine the use of alternatives to technical staff positions and to identify the hierarchical levels of the line personnel performing technical tasks.

Methodology

Multiple quantitative methods were adopted to carry out this study. Quantitative data about staff positions were retrieved from organizational documents collected for an MPhil study on organizational structure of central libraries of leading universities in Pakistan. Contents of organizational documents such as service structure documents, organizational charts and budgetary documents were perused to record the frequency of technical staff positions being sanctioned in university libraries and to note whether they were actually being filled. Education and experience requirements for the recruitment of technical staff positions were also quantified through perusal of these documents.

Principal author visited these libraries for the collection of data. Observation of library operations and informal discussions with library executives were carried out to measure the frequency of the levels of working of technical staff positions and alternatives adopted for the completion of technical jobs. Observation and informal discussions were also used to quantify the hierarchical levels of line personnel performing technical tasks in libraries.

Sampling

Purposive sampling was used to select university libraries for this study. Data were collected from leading universities having strong central libraries. Leading universities were identified on the basis of ranking made by Higher Education Commission of Pakistan (HEC) for the year 2013. HEC affiliates, administers and monitors universities in Pakistan. HEC has created seven categories to rank universities in Pakistan. These seven categories are given in the Table 1 against the name of each university. The results of the rankings were retrieved from HEC website that displays the results of rankings of universities and degree awarding institutions in Pakistan on an annual basis. A sample of ten universities having a strong central library was selected from the top five positions of each category. Two universities were selected from each general category (large, medium and small) because more than twenty universities were rated by HEC in each general category while one university was selected from each special category because HEC has provided a list of less than ten universities in each category.

Table 1.
List of University Libraries included in the Sample

Sr. No.	University name	Category
1	University of Agriculture, Faisalabad (UAF)	Agriculture/Veterinary
2	Lahore University of Management Sciences Lahore (LUMS)	Business Education
3	University of Engineering and Technology Lahore (UET)	Engineering & Technology
4	University of Health Sciences Lahore (UHS)	Medical
5	University of Punjab, Lahore (PU)	General University Large
6	COMSATS Institute of Information Technology	General University Large
7	Quaid-e-Azam University, Islamabad (QAU)	General University Medium
8	Govt. College University Lahore (GCU)	General University Medium
9	University of Faisalabad, Faisalabad (UOF)	General University Small
10	Beaconhouse National University Lahore (BNU)	General University Small

Data Analysis

Sanctioned frequency of technical staff positions

Half of the libraries have not created technical staff positions and their organizational structure is purely a line structure. One university has created four technical staff positions including two in government basic pay scale BPS 17 and two in scale 18 but no other university library has created technical staff positions in scale 18. One university library has sanctioned two staff positions and another three universities have only approved one position. Technical staff positions have been created in five public sector university libraries among a sample of seven libraries and none of the private sector university libraries (30% of sample) have sanctioned any technical staff position in their personnel hierarchy.

Table 2
Sanctioned frequency of technical staff positions

S.N.	No. of staff positions	No. of universities	%
1	Four positions	1	10
2	Two positions	1	20
3	One position	3	20
4	Staff positions do not exist	5	50
	Total	10	100

Recruitment against technical staff positions

The position of 'network administrator' is sanctioned in one university library and has been filled. Posts of 'computing officer - networking and database' have been approved in one university but only the post of 'assistant computing officer-networking' has been filled so far. Of the nine positions that have been created in other university libraries, only two posts (one for each university) have been filled. Among these nine positions, three are in government basic pay (BPS) scale 16, four are in scale 17 and two are in scale 18.

Qualification and experience required for technical staff positions

A Master of Computer Science or Master of Information Technology is the basic required qualification for the different staff position in BPS 17 and 18. Posts in lower scale need a two years' relevant experience while the posts in higher scales require at least five years professional experience. Technical staff positions in BPS 16 require a BSc, diploma in computer science, or a diploma in electrical/electronic technology with a diploma in hardware for each post. Qualification and experience requirements for one post were not available.

Table 3
Recruitment against technical staff positions

S.N.	Title of positions with scale in parenthesis	No. of universities	Filled or vacant
1	Deputy computing officer networking (18)	1	Vacant
2	Deputy computing officer database (18)	1	Vacant
3	Network administrator (BPS 17)	1	Filled
4	Assistant computing officer networking (17)	1	Filled
5	Assistant computing officer database (17)	1	Vacant
6	Assistant programmer (17)	1	Vacant
7	Library technologist (16)	1	Vacant
8	Data processor (16)	1	Vacant
9	Computer support supervisor (16)	1	Vacant
	Total universities	10	

Table 4.
Qualification and Experience required for different positions

S.N.	Title of positions	Required Q ualification (Experience)
1	Deputy computing officer networking	MCS (5 years)
2	Deputy computing officer database	MCS (5 years)
3	Assistant computing officer networking	MCS (2 years)
4	Assistant computing officer database	MCS (2 years)
5	Network administrator	Master CS/IT (2 years)
6	Assistant programmer	Master CS/IT (2 years)
7	Library technologist-16	Not available
8	Data processor-16	BSc and diploma in CS
9	Computer hardware supervisor-16	Diploma in electrical or electronic technology and diploma in hardware (2 years)

Level of working of technical staff positions

Centralized mode of operation has been adopted for

technical staff personnel and their alternatives in nine (90%) libraries. Technical staff personnel are performing their duties by providing expert advice and help in technical issues to manage technical operations of entire library sections. In only one university library (10%), staff personnel are working at the centralized level as well as taking additional responsibility as section head. In another instance an assistant computing officer has been made head of digital library section and is also looking after the matters of networking of library activities and streamlining the database management systems used for cataloguing of library content.

Table 5.

Level of working of technical staff positions

S.N.	Level of working	No of universities	%
1	Centralized functions	9	90
2	Combination of centralized and section level tasks	1	10
	Total	10	100

Alternatives of technical staff positions for automation related activities

All university libraries, whether they have recruited technical staff positions or not, have adopted different mechanisms for getting the technical work in done in the libraries. Five university libraries (50%) have automated their library operations with the cooperation of vendors and library professionals are managing these operations with their ongoing help. Two university libraries (20%) that have employed technical experts are also providing training opportunities to their library professionals to help them develop their technical expertise and they are all working in collaboration with each other along with help from the vendors providing the automation software. One university library (10%) has purchased the library software from library vendors and library professionals are managing the automation activities with the help of computer science department experts. Another (10%) has purchased the software from a library vendor and it is being managed by the library professionals with the help of technical experts in the library. One university library (10%) has been operating their automation activities with the help of computer science department, technical staff positions and library professionals. In this case a library vendor is not involved because the library software was developed by the computer science department of the university. Only one library is managing automation software solely with the help of its library professionals.

Table 6.

Alternatives of technical staff positions for automation related activities

S.N.	Combinations of different alternatives	No. of universities	%
1	Vendor companies and librarians	5	50
2	Computer sc. department, vendor and librarians	2	20
4	Computer sc. department, technical staff positions and librarians	1	10
5	Vendor, technical staff positions and librarians	1	10
6	Librarians having computer efficiency	1	10
	Total	10	100

Hierarchical level of line personnel entrusted the task of technical staff positions

Tasks of library professionals who are working as an alternative to technical staff positions are distributed at three hierarchical levels except for the top level. Upper middle hierarchical level exists only in few libraries and staff at this level is performing technical operations in only one library. Majority of the library professionals (90% universities) who are involved in technical operations are younger and working at lower and lower middle hierarchical levels in the library hierarchy.

Table 7.

Hierarchical level of line personnel entrusted the task of technical staff positions

S.N.	Hierarchical level of line personnel	No. of universities	%
1	Top hierarchical level	0	0
2	Upper middle level	1	10
3	Lower middle level	5	50
4	Lower (initial) level	4	40
	Total	10	100

Findings

More than fifty percent of the sample libraries were found to have not created technical staff positions for performing technology related tasks in the libraries. Four university libraries have created one or two positions for technical staff personnel. Among the libraries that have created staff positions only a few have recruited information technology experts against these sanctioned posts. Only two technical staff positions out of a total of nine sanctioned posts had been filled at the time of the study. The posts of programming, networking and database specialties have been created in different libraries for managing automation and creation of LAN in libraries. Minimum required qualification for these positions is either a Master of Information Technology or a Master of Computer Science. For positions commanding a lower BPS, a minimum of two-year experience is required while a five-year experience has been made mandatory for recruitment against higher grade posts.

Libraries that have not recruited technical staff are solving their technical problems by involving technology experts from the computer science departments within the universities. Majority of libraries that have not created technical staff positions are also using automation software vendors to help automate library operations. Only in one library, librarians are handling technical operations on their own. In all of the other libraries, different alternatives to technical staff positions such as library professionals, experts from computer science department and vendor companies are working collaboratively to help libraries cope with their everyday technical operations.

Majority of libraries have assigned duties to technical staff personnel at the central level in the libraries but a few libraries have also assigned duties of section heads to staff personnel as well. Rafiq and Ameen (2012) also proposed that a centralized facility should be established to digitize libraries' material within libraries. Line personnel working at lower middle and lower hierarchical levels are performing the technical tasks of library operations.

Technical staff positions have lower status than the library professionals working in libraries. It is found that no library in the sample has ever recruited technical staff personnel in positions higher than assistant librarian, the basic recruitment level in the library for line personnel. Only one library has created two higher grade technical staff positions but so far no technology expert has been recruited or promoted to fill these posts.

Conclusion and Recommendations

Libraries have to perform multiple technical tasks so it is not possible for the library professionals to perform all these operations on their own. Two approaches can be adopted to manage technology related tasks. LIS professionals having strong technology skills should be given preferences in recruitment or LIS professionals should "attain knowledge and skills in ICTs as services of most of the libraries are now evolving around information technology" (Fatima, Shafique & Firdous, 2012). Second approach is to recruit technology specialists in libraries to carry out technical operations to exploit the full potential of information technology. A blend of both the approaches will be helpful for university libraries in Pakistan to enhance the efficacies of library technologies.

In a university, the library is considered to be a staff organization and the status of library professionals is generally considered to be lower than that of the faculty. Similarly, technical staff personnel working in the libraries have inferior status as compared to qualified library professionals. The status of technical staff officers in library is neither at par with librarians nor equivalent to their education and skills. Lower status for technical staff has made it difficult for libraries to recruit and retain technical staff. This fact is evident from the findings of the current study that shows that majority of technical staff positions in libraries remained unfilled.

It is recommended that library administration should allow technical staff personnel to acquire the same status as the line personnel. They should be integrated in the service structure of the libraries to bring their status at par with the librarians and to enable them to achieve benefits according to their education and expertise. Appropriate status and benefits will provide them the opportunity to learn and innovate and ultimately help them advance in the library hierarchy. Libraries should recruit competent technical experts to expand the operational capacities of libraries in the

information age. More technical staff needs to be recruited to effectively manage the technical operations of a library.

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