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Effects of Automated Housekeeping Operations and Services on Work Productivity of University Library Professionals in Punjab, Pakistan

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Abstract

The study aimed to explore the effects of automated housekeeping operations and services on library and information science (LIS) professionals' work productivity in university libraries in the Punjab, Pakistan. It also aimed to gain an overview of the status of automation of housekeeping operations and services in the libraries. The study employed the quantitative research method. The data were collected from LIS professionals working in leading university libraries (both in public and private sectors) through the questionnaire.

The findings of the study suggest that most of the libraries included in the study had automated housekeeping operations. The majority of the libraries had also automated various services, such as reference service, selective dissemination of information (SDI) service, current awareness service (CAS), inter library loan service, book reservation, book renewal, fine payment, indexing service, abstracting service, document delivery service and library tutorials/information literacy service. The study reveals that the automated housekeeping operations and services had brought about positive effects on LIS professionals' work productivity and enhanced their efficiency. The findings of the study will help the library management to design and enhance the automated housekeeping operations and services in order to improve LIS professionals' work productivity.

Key words: Library automation, housekeeping operations, library services, work productivity, LIS professionals, university libraries, Pakistan

1. Introduction

Library plays an important role in any educational institution. It supports instructional, learning and research activities of the academic institution by providing a variety of information resources and services to faculty and students (Das & Chatterjee, 2015). With the introduction of information and communication technologies (ICT) in libraries, all types of libraries have started to be automated (Tabusum, 2013). Library automation may be defined as the application of automatic and semi-automatic data processing machines (computers) to perform traditional library housekeeping activities such as acquisition, circulation, cataloguing, reference service and serials control. Today, library automation is by far the most commonly used term to describe the mechanization of library activities using the computer (Uddin, 2009).

Library automation has gained importance in libraries due to accuracy, storage, versatility and speed in library housekeeping operations. In the past, library professionals spent a lot of time on manual housekeeping operations, and they were not able to provide all types of materials at one place. Automated housekeeping operations help to avoid duplication of efforts and enable library professionals to provide quick services at users' doorstep. Automated housekeeping operations reduce work load and save the time of library professionals, and thus increase their work productivity (SZ, S. et al., 2013).

With the advent of information and communication technologies (ICT), automation of housekeeping tasks and administration has become the primary goal of the greater part of the libraries. This is principally on the grounds that computerization of housekeeping activities and administration encourage libraries to limit human endeavors and redundant assignments, reclassify library work processes, plan staff to perform various tasks and library activities, and make staff more beneficial in library work (Saigal, 2017).

Library automation needs appropriate management for its usage. Library administrative staff ought to know present and future prerequisites for library automation as per needs of users. All housekeeping tasks like procurement, recording, circulation and so on ought to be done cautiously. Preparing of staff and client training is the way to success (Sz, Shabana et al., 2018). Automated housekeeping operations and services play a vital role in the life of LIS professionals because of accuracy, speed and reducing of workload (Das & Chatterjee, 2015). Library automation is necessary to provide efficient library services as it helps to give services quickly, efficiently and effectively (Saigal, 2017).

2. Literature review

2.1 Library automation

The Oxford English dictionary (1989) has defined automation as the execution of instinctive control by the use of electronic devices replaced by man power. According to Encyclopedia of Library and Information Science (1997), library automation is:

> *"the utilization of programmed and self-loader information preparing machines to perform such conventional library exercises as acquisitions, indexing and dissemination. These exercises are not really acted in customary manners, the exercises themselves are those customarily connected with libraries; library automation may in this way be recognized from related fields, for example, data recovery fields, programmed ordering and abstracting and programmed printed examination*".

Moorthy (2004) has stated that automation makes easier management of a library in a better way because it saves budget, time and human energy. In automation, typed data can be reused for other purposes too, for example, when bibliographic data is typed for acquisition of material, further this data can be used for cataloguing, circulation and classification. The main advantage of

automation is accuracy and speedy work. Automation helps to make bibliographies, storage and speedy retrieval of data. Automation improves the productivity of library services by taking decisions and making reports without any mistake.

Das and Chatterjee (2015) have noted that library automation has become a very famous word for library professionals. By using automation, libraries can provide services more efficiently as compared to manual/traditional services. The process of conservation of records and generations of reports becomes easy due to automation. But a successful library automation system needs proper planning for its implementation in the library.

Rao et al. (2009) have stated that libraries are an important source of instruction since every library is a center point of information. Thus, mechanization is essential for libraries. It is the best approach to successfully modernize their capacities and administration, which makes them more proficient at reacting to the requirements of their users. Library computerization is seen as the complete composite of innovations expected to bring to library users the vital access and administration to answer genuine data needs. Automation makes the library framework, assets, and administration more alluring and intelligent, thus helping libraries to live up to their users' desires.

2.2 Development of library automation

Various phases of development of library automation as described by Kaul (1999) are presented in the following table 1.

Table 1
Development of library automation

GROWTH OF LIBRARY AUTOMATION

YEAR	DEVELOPMENTS
1940-1949	Semi-mechanical applications including edge-notched cards, optical coincidence, peek-a-boo cards.
1950-1959	Use of punched cards, data processing equipments, early computers and micro image searching systems.
1960-1969	Application of general purpose digital computers, feasibility studies of online interactive and advance micro image systems, experiments in library networking.
1970-1979	Design of online systems and conversion of batch systems into online mode, growth of library network and databases.
1980-1989	Intensive use of online systems, networks, mini and microcomputers, optical disks, CD-ROMs, FAX etc.
1990s	Use of internet and library networks aims towards higher levels of computer application such as recording through electronic media, artificial intelligence etc.

Horsfall (1992) has described the beginning of library automation, establishment and addition of online free lists (OPACs), on-line intelligent preparing frameworks, creation of the watchword in setting (KWIC) files for articles showing up in Chemical Abstracts, and the game plan of the library inside its parent organization as a noteworthy shopper of IT capital hardware. During the latter part of the 1960s and the 1970s, libraries joined helpful activities to control the cost of PC frameworks and, furthermore, attempted to keep up a global guideline for information

accessibility and exchange. These kinds of associations included Birmingham Libraries Cooperative Mechanization Project (BLCMP) in the UK and the Ohio Colleges Library Center (OCLC) in the USA. The library cooperatives not just made information open to mutual shared information, yet in addition gave computerization frameworks. Around then, libraries helped IT out-units in their foundation to create programming identified with the library. The college libraries were at the mid of this IT advancement, everywhere in the world.

Barlow and Graham (1999) noted that the usage of acquired software packages for classical library management of practical work, such as cataloguing and circulation, was more usual and common than that for in-house progressed operations in commercial libraries in the UK in the 1990s. They also observed that the library catalogue was the most famous field for automation.

Groenewegen, (2010) stated that in Europe, the period from 1960 to 1965 was a period overwhelmed by expanding consciousness of the capacities of library computerization because of abroad viability, particularly in the USA. This was when most college libraries in the USA started library mechanization utilizing powerful cards.

2.3 Automated housekeeping operations

Dhawan (2017) stated that library housekeeping operations may be classified in four parts, such as acquisition, processing, use and maintenance. He noted that library housekeeping operations and routine work can be carried out with the help of a computer or a network of computers quickly and cheaply. As shown in figure 1, library housekeeping operations are different in nature but are interconnected to each other.

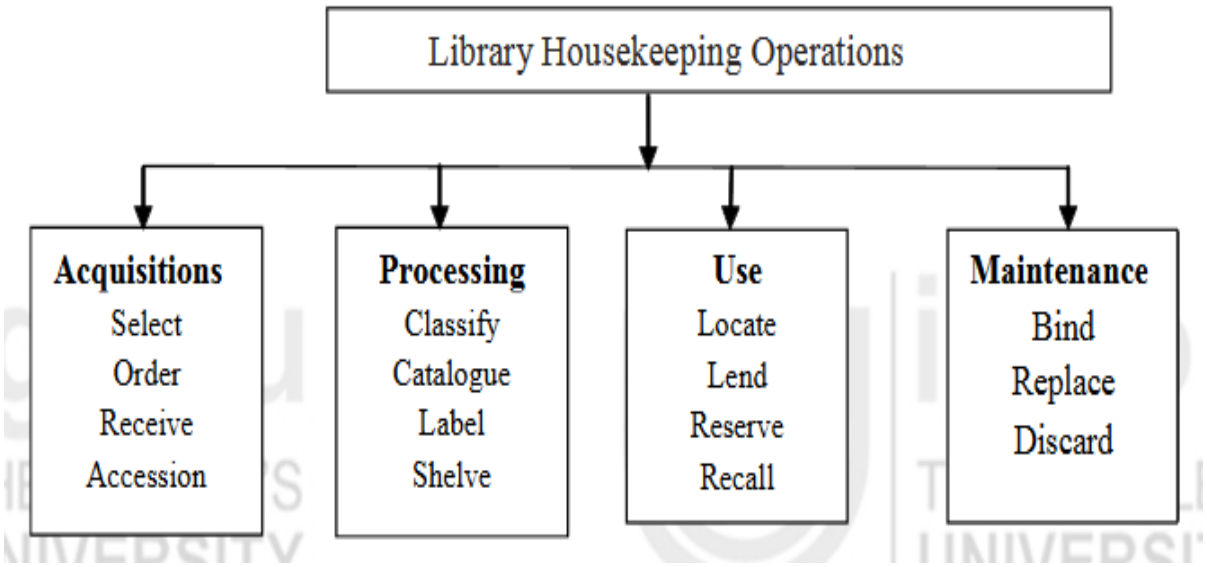

Figure 1: Library housekeeping operations

Library housekeeping operations include acquisition, classification, cataloguing, circulation and serial control. Acquisition of library material is the basic function of any library. Acquisition's functions include selection, ordering, receiving and accessioning of library material. Classification is the foundation of librarianship. Through classification, library material can be organized according to specific subject contents. Catalogue is a key to a library. Through the catalogue, users can find the location of their desired material. Circulation involves charging (issue of material) and discharging (return of material) in a library. This function needs to keep records of users and material that is lent by the library. Serials are the primary sources for getting scientific information. The library is required to manage its serial section properly in order to meet users' information needs. All these housekeeping operations can be performed in an effective manner through computerization. Automating housekeeping operations not only saves the time, cost and human labour but also improves quality and efficiency of the work (Dhawan, 2017).

Uddin (2009) has noted that library mechanization might be characterized as the utilization of programmed and self-loader information preparing machines (PCs) to perform conventional library housekeeping exercises, for example, procurement, dissemination, listing and reference, and serials control. Today, library automation is the most generally used term to portray the automation of library exercises utilizing the PC.

Haneefa, M. (2007) has noted that the approach of ICT in libraries has become unavoidable in the span of information outbreak, extensive and worldwide use of digital information systems. The productive and constructive approach of ICT in libraries guides in conducting housekeeping operations effectively.

2.4 Automated library services

Mayega, S. (2008) has stated that generally, there are two types of library services, i.e., library public services for users and library technical services for users. The library public services include circulation, bibliographic information, documents delivery service, selective dissemination of information service, current awareness service, reference services, and special collection service for users. Whereas, technical services include acquisition of material, cataloguing, classification, indexing and abstracting services, and management of the library environment. Both of these two types of services can be performed efficiently through computerization.

2.5 Effects of automated housekeeping operations and services on work productivity

Sahu et al. (2013) have stated due to the fact that the modern libraries are automated, the libraries should train their employees in ICT as the automation has a positive effect on their productivity. Bii and Wanyama (2001) reported that despite the fact that there were issues with

the execution of the library computerized system in Margaret Thatcher Library of Moi University in Kenya, staff considered it as a means of improvement for performing their tasks. Uwaifo, (2007) investigated introduction to PCs as determinants of perspectives of automation in the Nigerian libraries. The study suggested that most of the library professionals considered the automation as a positive change in their routine work.

Adekunle et al. (2007) noted that librarians in Nigerian universities had a positive attitude towards the use of ICT because they had skills and knowledge, and appreciated the benefits of application of ICT in their routine work. Satpathy et al. (2011) have stated that ICT devices are utilized in libraries for more productive administration of the library and to give all necessities to users. In this changing foundation of library, the library and data experts must show legitimate ICT aptitudes to administrate the cutting-edge libraries. They have to get non-stop information and capacities/training because of expediently changing correspondence innovation to give great library administration to the users.

3. Objectives

The objectives of this study are:

i. To gain an overview of the status of automated housekeeping operations in university libraries of the Punjab, Pakistan.
ii. To acquire an overview of the status of automated services in university libraries of the Punjab, Pakistan.
iii. To explore effects of automated housekeeping operations and services on work productivity of LIS professionals in university libraries of the Punjab, Pakistan.

4. Methodology

The study employed the quantitative research method to achieve its objectives. On the basis of the literature review, a questionnaire was developed to collect the quantitative data from LIS professionals working in leading university libraries (five each from public and private sector) in the Punjab, Pakistan by adopting a convenience sampling technique. The selected libraries had embraced ICT to perform various tasks and services, which included University of the Punjab library, Lahore, University of Engineering and Technology library, Lahore, Government College University library, Lahore, Bahauddin Zakariya University library, Multan, and The Islamia University of Bahawalpur library from the public sector, and Lahore University of Management and Sciences library, University of Management and Technology library, Lahore, University of Central Punjab library, Lahore, Forman Christen College University library, Lahore and Institute of Southern Punjab library, Multan from the private sector.

5. Data analysis

In order to achieve objectives of the study, descriptive statistics (i.e. frequency, percentages, mean and standard deviation) have been used to analyze the quantitative data collected through the questionnaire. The data are analyzed and presented in the following sections.

5.1 Response rate

To collect data for the study, the link to the online questionnaire was sent by e-mail to 115 library professionals working in university libraries (both public and private sectors) included in the study. Out of 115 respondents, 80 respondents filled out and returned the questionnaire with a response rate of 69.56%. Amongst 80 respondents, the majority of the respondents (58, 72.5%) belonged to the public sector university libraries, while 22(27.5%) respondents came from private sector university libraries (Table 2).

Table 2
Response rate by sector of universities (N=80)

Sector	Frequency	%
Public sector	58	72.5%
Private sector	22	27.5%
Total	80	100.0%

5.2 Demographic information

5.2.1 Respondents' gender

Of the 80 respondents, the majority of the respondents (45, 56.2%) were male and 35(43.8%) were female. Amongst 58 respondents of public sector university libraries, 30 (51.7%) respondents were male and 28 (48.2%) were female, whereas amongst 22 respondents of private sector university libraries, 15 (68.2%) were male and 7 (31.8%) were female (Table 3).

Table 3
Respondents' gender (N=80)

University Sector	Male		Female		Total	
	N	%	N	%	N	%
Public	30	51.7	28	48.2	58	72.5
Private	15	68.2	7	31.8	22	27.5
Total	45	56.2	35	43.8	80	100

Chi-square test was performed to determine the significant association between the respondents' gender and the sector of university libraries. Finding indicates no significance relationship between the respondents' gender and the sector of university libraries, where chi-square has a value of 1.755.

5.2.2 Respondents' age group

Most of the respondents (40, 50.0%) were between 31-40 years of age and 27(33.7%) respondents were between 20-30 years of age. Among 58 respondents of public sector university libraries, 25 respondents (43.1%) were between 20-30 years of age and 25 respondents (43.1%) were between 31-40 years of age. Whereas, among 22 respondents of private sector university libraries, the majority of the respondents 15 (68.1%) were between 31-40 years of the age (Table 4)

Table 4

Respondents' age group (N=80)

University Sector	20-30		31-40		41-50		51-60		Total	
	N	%	N	%	N	%	N	%	N	%
Public	25	43.1%	25	43.1%	7	12.0%	1	1.72%	58	100.0%
Private	2	09.0%	15	68.1%	3	13.6%	2	09.0%	22	100.0%
Total	27	33.7%	40	50.0%	10	12.5%	3	3.75%	80	100.0%

Chi-square test was performed to determine the significant association between the respondents' age group and the sector of university libraries. Finding indicates no significance relationship between the respondents' age and the sector of university libraries, where chi-square has a value of 9.813.

5.2.3 Respondents' professional qualification

As presented in table 5, the majority of the respondents (47, 58.7%) possessed a master's degree, 13(16.2%) a BS (HONS) degree, 12(15.0%) an M.Phil. degree, 7(8.7%) had a bachelor degree or diploma in library and information science, while only one respondents had a PhD degree. Among 58 respondents of public sector university libraries, the majority of the respondents 41(70.6%) had a masters' degree in LIS, while among 22 respondents of private sector university libraries, the majority of the respondents 8(36.3%) had a BS (HONS) degree in LIS. (Table 5)

Table 5
Respondents' professional qualification (N=80)

University Sector	BLIsc/DLIsc		BS(HONS)		MLISs		M.Phil.		PhD		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Public	6	10.3%	5	8.6%	41	70.6%	6	10.3%	0	0.0%	58	100.0%
Private	1	04.5%	8	36.3%	6	27.2%	6	27.2%	1	04.5%	22	100.0%
Total	7	8.7%	13	16.2%	47	58.7%	12	15.0%	1	01.2%	80	100.0%

Chi-square test was performed to determine the significant association between the respondents' level of qualification and the sector of university libraries. Finding indicates no significance relationship between the respondents' qualification and the sector of university libraries, where chi-square has a value of 18.969.

5.2.4 Respondents' professional experience

As presented in table 6, the majority of the respondents (46, 57.5%) had the experience up to 5 years, and 17(21.2%) between 6-10 years, 13(16.2%) between 11-15 years, 3(3.7%) between 16-20 years and only 1(1.2%) respondent had the experience between 21-25 years.

Among 58 respondents of public sector university libraries, the majority of the respondents 35(60.3%) had experience up to 5 years. Whereas, among 22 respondents of private sector university libraries, the majority of the respondents 11(50.0%) had experience up to 5 years (Table 6)

Table 6
Respondents' experience (N=80)

University Sector	Up to 5		6-10		11-15		16-20		21-25		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Public	35	60.3%	12	20.6%	10	17.2%	1	01.7%	0	0.0%	58	100.0%
Private	11	50.0%	5	22.7%	3	13.6%	2	09.0%	1	04.5%	22	100.0%
Total	46	57.5%	17	21.2%	13	16.2%	3	03.7%	1	01.2%	80	100.0%

Chi-square test was performed to determine the significant association between the respondents' experience and the sector of university libraries. Finding indicates no significance relationship between the respondents' experience and the sector of university libraries, where chi-square has a value of 5.400.

5.3 Status of automation of housekeeping operations

The respondents were asked to provide information about the status of automation of housekeeping operations in their respective libraries. They were required to provide their responses by using a five-point Likert scale (Not automated=1, Under process=2, To some extent automated=3, Moderately automated=4, Fully automated= 5). The majority of the respondents reported that their libraries had automated cataloguing (mean=3.63, rank=1). The respondents informed that their libraries had automated classification (mean=3.59, rank=2), circulation (mean=3.43, rank=3), serial control (mean=3.16, rank=4) and acquisition (mean=2.80, rank=5). (Table 7)

Table 7
Status of automation of housekeeping operations (N=80)

Rank	Housekeeping operation	N	Mean	St. Deviation
1	Cataloguing(OPAC)	80	3.63	1.226
2	Classification	80	3.59	1.209
3	Circulation	80	3.43	1.412
4	Serial control	80	3.16	1.307
5	Acquisition	80	2.80	1.237

(Not automated=1, Under process=2, To some extent automated=3, Moderately automated=4, Fully automated= 5)

5.4 Status of automation of library services

The respondents were required to provide information about the status of automation of library services in their respective libraries. They were required to record their responses by using a five-point Likert scale **(**Not automated=1, Under process=2, To some extent automated=3,

Moderately automated=4, Fully automated= 5**)**. The majority of the respondents reported that they had online searching service (mean=3.96, rank=1). The respondents informed that they had automated indexing service (mean=3.53,rank=2), reference service (mean=3.50, rank=3), current awareness service (CAS) (mean=3.49, rank=4), abstracting service (mean=3.46, rank=5), library tutorials/information literacy service (mean=3.36, rank=6), document delivery service (mean=3.35, rank=7), fine payment (mean=3.30, rank=8), selective dissemination of information (SDI) service (mean=3.28, rank=9), book reservation (mean=3.25, rank=10), book renewal (mean=3.20, rank=11) and inter library loan service (mean=2.88, rank=12) (Table 8).

Table 8
Status of automation of library services (N=80)

Rank	Library service	N	Mean	St. Deviation
1	Online searching service	80	3.96	1.152
2	Indexing service	80	3.53	1.331
3	Reference service	80	3.50	1.283
4	Current awareness service (CAS)	80	3.49	1.212
5	Abstracting service	80	3.46	1.340
6	Library tutorials/information literacy service	80	3.36	1.305
7	Document delivery service	80	3.35	1.342
8	Fine payment	80	3.30	1.382
9	Selective dissemination of information (SDI)	80	3.28	1.253
10	Book reservation	80	3.25	1.373
11	Book renewal	80	3.20	1.418
12	Inter library loan service	80	2.88	1.391

(*Not automated=1, Under process=2, To some extent automated=3, Moderately automated=4, Fully automated= 5****)***

5.5 Effects of automated housekeeping operations and services on work productivity

The respondents were asked to provide their opinions regarding effects of automated housekeeping operations and services on their work productivity. They were required to provide their responses about different statements using a five-point Likert scale (Strongly disagree= 1, Disagree =2, No opinion/Neutral =3, Agree=4, Strongly agree =5). The majority of the respondents agreed that the automation of housekeeping operations and services helps them to develop and maintain cooperation at workplace (mean=4.25), helps to develop self-learning skills (mean=4.25).The respondents agreed that the automation of housekeeping operations and services facilitates resource sharing/networking among libraries (mean=4.21), it helps to avoid from duplication of work (mean= 4.21), it enhances speed of work (mean=4.21), it improves effectiveness of work (mean= 4.21), it helps to maintain discipline in work (mean=4.19), it makes work easier (mean =4.15), it motivates them to perform tasks effectively (mean=4.14), it helps to preserve information easily (mean=4.14), it helps to develop better communication skills (mean=4.11), it increases operational efficiency (mean=4.11), it makes work more enjoyable (mean=4.05), it helps to retrieve required information easily (mean=4.05), it helps to communicate easily with other library professionals, users and libraries(mean= 4.03), it relives them from clerical/repetitive work (mean=4.03), it reduces the time spent on work (mean =4.00), it helps to make better relations with users (mean=4.00), it helps to organize information easily (mean=4.00), it improves quality of work (mean=4.00), it helps to keep users updated about information resources and services (mean =3.91), it helps to reduce work load (mean= 3.86), it improves the management of information resources and services (mean=3.85), it helps to provide wider access to information for users (mean =3.59), it facilities to deliver information resources

and services to users effectively (mean=3.39), it gives a great deal of job satisfaction (mean=3.39), it helps to provide new services (mean =2.80) (Table 9).

Table 9
Effects of automated housekeeping operations and services on work productivity (N=80)

Rank	Statements	N	Mean	St. Deviation
1	It helps me to develop and maintain cooperation at workplace	80	4.25	0.921
2	It helps me to develop self-learning skills	80	4.25	0.921
3	It facilitates resource sharing/networking among libraries	80	4.21	0.964
4	It helps to avoid from duplication of work	80	4.21	0.964
5	It enhances speed of my work	80	4.21	0.964
6	It improves effectiveness of my work	80	4.21	0.964
7	It helps to maintain discipline in my work.	80	4.19	1.007
8	It makes my work easier	80	4.15	0.982
9	It motivates me to perform my tasks effectively	80	4.14	0.938
10	It helps me to preserve information easily	80	4.14	0.938
11	It helps to develop better communication skills	80	4.11	1.006
12	It increases operational efficiency	80	4.11	1.006
13	It makes my work more enjoyable	80	4.05	1.042
14	It helps me to retrieve required information easily.	80	4.05	1.042
15	It helps me to communicate easily with other library professionals, users and libraries.	80	4.03	1.067
16	It relives me from clerical/repetitive work	80	4.03	1.067
17	It reduces the time I spend on my work	80	4.00	1.031
18	It helps me to make better relations with users	80	4.00	1.114

19	It helps me to organize information easily	80	4.00	1.031
20	It improves quality of my work	80	4.00	1.114
21	It helps to keep users updated about information resources and services	80	3.91	1.234
22	It helps to reduce work load	80	3.86	1.166
23	It improves the management of information resources and services	80	3.85	1.069
24	It helps me to provide wider access to information for users	80	3.59	1.209
25	It facilities me to deliver information resources and services to users effectively	80	3.39	1.131
26	It gives me a great deal of job satisfaction	80	3.39	1.131
27	It helps me to provide new services, for example online reference services, which are otherwise not possible.	80	2.80	1.237

(Strongly disagree= 1, Disagree =2, No opinion/Neutral =3, Agree=4, Strongly agree =5)

6. Discussion

Through automation, various housekeeping operations, such as acquisition, cataloguing, classification, circulation and serial control can be performed effectively and efficiently. Automated housekeeping operations help to reduce time, energy and human labor, and enhance quality and efficiency. The findings suggest that most of the libraries included in the present study had automated their housekeeping operations. The introduction of ICT in libraries have changed both the way libraries offer services to users and the way the users access the services. Academic libraries play an important role in meeting information needs of the academic community. They support teaching, learning and research activities of academic institutions. They are required to meet information needs of the research community by improving their service through the application of technological innovations, so that users can benefit from their

services. It was found that the majority of the libraries included in the study had automated most of the library services, such as reference service, selective dissemination of information (SDI) service, current awareness service (CAS), inter library loan service, book reservation, book renewal, fine payment, indexing service, abstracting service, document delivery service and library tutorials/information literacy service.

. With the advent of ICT into libraries, the way the libraries carry out routine work and deliver services has drastically changed. A number of academic libraries throughout the world have automated their housekeeping operations and services. Library automation has gained importance in academic libraries due to accuracy, storage, versatility and speed in library housekeeping operations. In the past, library professionals spent a lot of time on manual housekeeping operations, and they were not able to provide all types of material at one place. Automated housekeeping operations help to avoid duplication of efforts and enable library professionals to provide quick services at users' doorstep. Automated housekeeping operations reduce work load and save the time of library professionals, and thus increase their work productivity (SZ, S. et al., 2013). Academic libraries have also started providing various services over the Internet or online services. The libraries are now able to provide services to the community wherever it is located. Automated housekeeping operations and services bring many benefits to library staff. The findings of the study suggest that automated housekeeping operations and services have brought about positive effects on work productivity of LIS professionals working in the academic libraries included in the study in many ways and enhanced their efficiency.

7. Conclusion

The study explored the effects of automated housekeeping operations and services on workplace productivity of LIS professionals working in university libraries in the Punjab, Pakistan. The findings suggest that the majority of libraries had automated housekeeping operations, such as cataloguing, classification, circulation, serial control, acquisition. The libraries had also automated various services, such as reference service, selective dissemination of information service, current awareness service, inter library loan service, book reservation, book renewal, fine payment, indexing service, abstracting service, document delivery service and library tutorials/information literacy service. The automated housekeeping operations and services had brought about positive effects on LIS professionals' work productivity and enhanced their efficiency. The findings of the study will help the library management to design, implement and enhance the automated housekeeping operations and services in order to improve LIS professionals' work productivity.

8. Recommendations

The following recommendations are made:

1. Automation needs a whole setup of costly ICT equipment; therefore, the university administration should provide sufficient funds to libraries for the implementation/up-gradation of automation.
2. The university libraries should develop/upgrade essential ICT infrastructure for managing automated housekeeping operations and services effectively.
3. Libraries should allocate a distinct fund in their periodic budgets to meet recurring expenditure of automation. The university authorities should enhance academic libraries' budgets for meeting the recurring expenditure of the automation.

4. The libraries should enhance their automated housekeeping operations and services to improve their LIS professionals' work productivity.
5. Libraries should arrange in-house training sessions for their staff to enable them to perform housekeeping operations and handle online services effectively.
6. LIS schools and library associations in the country should organize workshops and seminars to provide training in library automation to LIS professionals working in academic libraries.
7. Library associations in the country should play their effective roles in developing automated libraries. They should provide the consultation and suitable software to academic libraries for automation. The libraries which need to upgrade the automation should use open-source software for automation instead of waiting for the budget for purchasing costly software.
8. LIS schools in the country should include contents on automated housekeeping operations and services in their syllabi in order to equip the future LIS professionals with necessary knowledge and skills to handle automated housekeeping operations and services effectively.

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