

# STATUS OF LIBRARY AUTOMATION IN TANZANIA'S PUBLIC UNIVERSITIES

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## **Abstract**

*This paper examines the current status of library automation in Tanzania's public universities. It is based on a study that was conducted from September 2014 to June 2015. The paper argues that library automation is not an option but a necessity in this ICT era. In fact, the study established that all eight (8) public university libraries have automated their library functions at different levels. On the sources of funding for library automation it was established that reliance on donor support remained the major source of funding for library automation in Tanzania's public university libraries. The study findings also show that there is no universally available dominant library management software among public university libraries in the country. As such, there was an urgent need to come up with standard software among public university libraries to facilitate information sharing and exchange of among these institutions. In addition, barriers to effective library automation ought to be overcome to ensure the sustainability of library automation.*

**Keywords:** Automation, Public University library, Tanzania, Library Automation.

## **Introduction**

Library automation refers to the application of ICT to library operations and services (UNESCO, 2015). The major functions that may be automated include acquisition, cataloguing, Public Access Catalogue (OPAC) and WebPAC, indexing and abstracting, circulation, serial management and references (UNESCO, 2015).

Generally, interest in library automation has gained global importance, especially in developing countries such as Tanzania which have witnessed phenomenal growth in the use of ICT in many spheres of life. The impact of ICT is so substantial that it affects virtually every field of human endeavour in this knowledge era. Similarly, libraries are employing ICTs to automate administrative and technical processes as well as building databases. Increasingly, this phenomenal ICT growth has assisted public university libraries in Tanzania to adjust the way they offer their services. In particular, there has been a shift from manual to automated systems in order to improve efficiency, quality and operations in providing learner support services to the larger segment of users in Tanzania's public university libraries.

## **Review of Literature**

In Tanzania, a considerable number of studies on automation in the context of public university libraries have been conducted but they have mainly focused on a particular university library and therefore fail to provide a composite picture of other public university libraries.

Mulimila (2000) conducted a regional study on Information Technology (IT) applications in East Africa government-owned university libraries for the 1987-1997 period, which only covered two state-owned university libraries in Tanzania. These were the University of Dar es Salaam and Sokoine University of Agriculture libraries. Among the East African university libraries surveyed, only Moi University library by that time had automated its catalogue and circulation. The situation of the two public-owned university libraries in Tanzania had since changed as they had also jumped onto the library automation bandwagon. Moreover Mulimila's (2000) study had been carried out many years back. The current study, therefore, sought to establish the present state of library automation in Tanzania's public university libraries.

Manda (2003), Wamunza (2003) have focused on planning for the automation for the university library at the University of Dar es Salaam library. Whereas this body of research has provided useful information on library automation process, the two studies fall short of establishing what has actually been achieved after automation.

Msuya (2002), on the other hand, conducted a study on the information seeking behaviour of library users in a changing the library environment using the Faculty of Law staff members of the University of Dar es Salaam as a case study. The study found major changes to include the computerisation of library services. The scope of this study was limited to University of Dar es Salaam and, therefore, could not shed light on the library automation of other public universities. Kasulwa's (2008) report has mentioned the automation efforts in Tanzania, citing the University of Dar es Salaam library as an example, concluding that some universities were in the process of automating their respective libraries. Little else, however, is known about other universities' library automation status.

In 2012, the Tanzania government, through the Commission for Science and Technology (COSTECH) commissioned the Economic and Social Research Foundation to carry out a

national feasibility study for the implementation of an Education Management Information System (EMIS) and E-Library system for All Higher Education and Research Institutions in Tanzania. The study covered both public and private Institutions. In all, the study covered 120 higher education and research institutions. Seventy-one (71) higher education institutions and forty-nine research institutions were involved. The study established that only 26 percent of the libraries surveyed were automated, leaving a staggering 74 percent of the libraries un-automated. The feasibility study revealed that most of the libraries both academic and research in the country were not yet automated. This survey is too inclusive and too general to do justice in exploring the status of library automation in public university libraries, which are viewed as pioneers of library automation in the country. Therefore, the present study attempts to look into library automation from the perspective of public university libraries in Tanzania to provide a better understanding of their current automation status.

### **Objectives of the study**

The general objective of this study was to explore the current status of library automation in Tanzania's public university libraries. Accordingly, this study specifically sought to:

- (i) Find out the extent to which public university libraries are automated.
- (ii) Establish dominant areas of automation in public university libraries.
- (iii) Identify the kind of software used in the automation of public university libraries.
- (iv) Examine the benefits of automation in public university libraries.
- (v) Identify the automation barriers in public university libraries.

### **Research Methodology**

Based on the objectives of the study, data collection from the eight public university libraries under review involved a questionnaire survey with both closed and open ended questions, structured interviews and participant observations. The list of public university libraries was developed using the Tanzania Commission of Universities (TCU) website ([www.tcu.go.tz](http://www.tcu.go.tz)) directories and the list from the Ministry of Education and Vocational Training. The questionnaire administered had 23 questions. These were administered randomly to 100 library staff in person. The selection criteria took into account their qualifications from a first degree to doctorate levels and their experience in a library automated environment. Out of 100 questionnaires administered, 91 were returned. The remaining nine others were discarded because of incomplete data, leading to a return rate of 91 percent. Conway and Powel

(2010:147) recommend this method as it facilitates the collection of large amounts of data in a relatively short period.

Structured interviews, on the other hand, were used to get information from the Directors of library services. Both telephone and face-to-face methods were used. This method was used because in some cases the data needed elaborations. Issues of concern were related to the opinions and attitudes. In all, the information generated through interviews complemented information gathered through the questionnaire survey. Patton (1990) and Seidman (1991) recommend this method because it enables the researcher to get the interviewees' inner perspectives and the meaning they make through clarifications made in the course of exchanging ideas.

The observation method was used to collect data aimed to supplement information gathered through questionnaires and interviews. In this research, the researchers used non-participant observation to observe what was taking place in the libraries surveyed. As Kumar (2012) notes, an observation is a purposeful, systematic and selective way of watching and listening to an interaction or phenomenon as it takes place. Morrison recommends this method as it helps to eliminate issues of subjectivity. As already discussed, this method was employed to complement other research instruments.

### **Sample and Population of the Study**

The study conducted in Tanzania was limited to the following public university libraries namely: the University of Dar es Salaam, Sokoine National Agriculture, The Open University of Tanzania, Ardhi University, Muhimbili University of Health and Allied Sciences, Dodoma University, State University of Zanzibar, Mzumbe University. At the time of conducting this research, Tanzania had ten public university libraries. However, for this study only eight university libraries were involved. Mbeya University of Science and Technology and Moshi Co-operative University were not included because they were elevated to university level when the research had already begun in earnest. Nevertheless, the research findings fairly reflect the status of library automation in public universities as they are also funded by the government. The population of the study constituted eight public university libraries, all professional librarians in public university libraries and directors of libraries. A purposive sampling approach was used to select key informants situated within the predefined study area. The respondents were selected on the basis of their involvement in assisting information

users get resources in an automated library environment. This population appears coherent because the universities covered are all owned and financed by the Tanzania government and the librarians were selected because they are the largest group in the information sector in the country's public universities.

SPSS version 16 was employed to analyse quantitative data from the 91 returned questionnaires. Qualitative data collected from interviews with directors of libraries, on the other hand, was transcribed and arranged according to their emerging themes and subjected to content analysis.

## Results and Discussion

### Distribution of respondents by Institutions

The question on the name of the university was asked for the purpose of keeping statistics of the institutions, which participated and responded with relevant information for analysis and discussion. For the present study the following public university libraries were involved as indicated in Table 1.1:

**Table 1.1: Distribution of Respondents by Institutions**

Category	Frequency	Percent
University of Dar es Salaam (UDSM)	13	14.3
Open University of Tanzania (OUT)	14	15.4
Muhimbili University of Health and Allied Sciences (MUHAS)	8	8.8
Mzumbe University (MU)	19	20.9
Ardhi University (ARU)	7	7.7
Sokoine University of Agriculture (SUA)	7	7.7
State University of Zanzibar (SUZA)	10	11.0
University of Dodoma (UDOM)	13	14.3
<b>Total</b>	<b>91</b>	<b>100.0</b>

Source: Survey Data (2014/15)

### Commencement of automation

In Tanzania, as in many developing countries, library automation is a new phenomenon though some notable progress has been made thus far. The question on when the library automation started was intended to provide historical background and trends of automation in Tanzania's public university libraries. This question was addressed to the eight public university libraries. The results are summarised in Table 1.1.

The findings show the University of Dar es Salaam library was the first and oldest university in the country and the first to automate its functions in the early 1990s. Then other universities followed suit in 1991-2000 (30%), 2001-2010 (43%) and 2011-2014(26%). The results reveal that although library automation is a new phenomenon in Tanzania, public university libraries have registered good progress in automation as they have partially automated some of their functions. By 2010, library automation process has reached a high percentage of 43 percent. This increase may be attributed to the availability of open source software during the period under review, which was freely available.

**Table 1.2: Year of Library Automation**

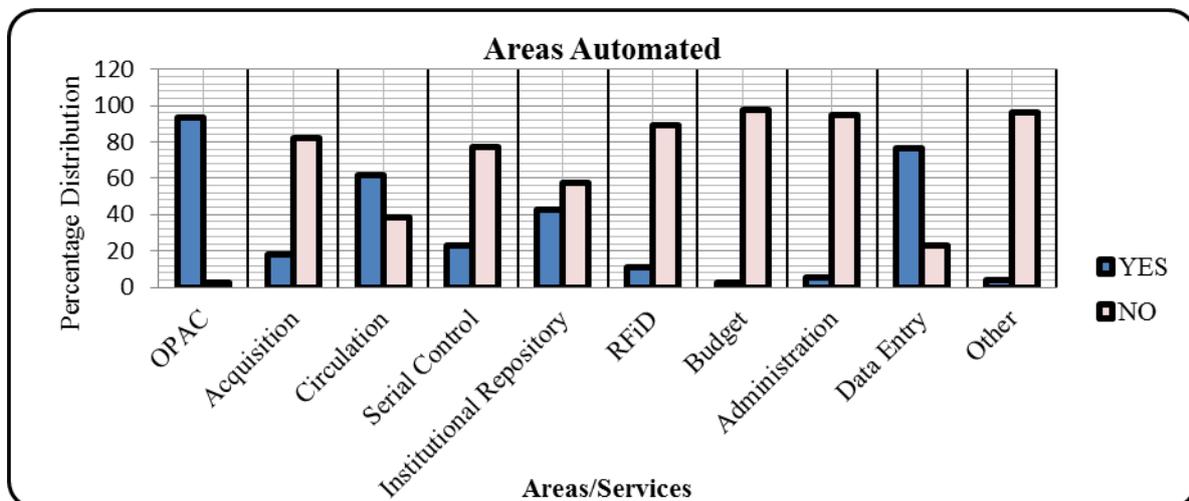
<b>Name of the Library</b>	<b>Year of Library Automation</b>
University of Dar es Salaam	1990
The Open University of Tanzania	2004
* Muhimbili University of Health and Allied Sciences	2005
*Ardhi University	2004
Sokoine University of Agriculture	1998
State University of Zanzibar	2014
University of Dodoma	2015
Mzumbe University	2002

*\*Library automation was started when they were constituted colleges of the University of Dar es Salaam as Muhimbili University College of Health Sciences (MUCHS) and University College of lands and Architectural Studies (UCLAS).*

### **Status of library automation**

Library automation is employed to facilitate and expedite library operations, services and access to and delivery of information in a timely and efficient manner. The data collected from eight public university libraries surveyed shows that all the eight (8) public university libraries had automated their library functions at different levels. Generally, the pattern of responses differed from library to library. All the eight universities surveyed had partially automated their functions to different levels. This development is an encouraging trend for a developing country such as Tanzania (For details see Figure 1.1.).

In addition, the respondents were asked to indicate areas, which have been automated. Their responses show that the libraries surveyed had computerised their catalogues by 95 percent, followed by serial control. A dominant function, which had been automated by all libraries, was cataloguing (95%) and the section with the least automated functions was budgeting (5%). The automation for libraries has been necessitated by the need to get away from the tedious manual processing of materials such as filing of card catalogues and improvement of the visibility and accessibility of information on a timely and efficient manner. A similar study conducted by Arachch and De Silva (2007) on library automation that focused on the strategies for library human resource management and the Tanzania Commission for Science and Technology (COSTECH, 2012) report support the findings of the current study by affirming that the library catalogue had been computerised in most of libraries (89.5%). The least available module was budgeting, which accounted for only five percent. However, as Figure 1.2 illustrates, the automation had not attained full automation and most functions remained single function only. This finding contradicts with those by Metil (2013) in form, content and fact, which affirmed that only the University of Dar es Salaam had completed automating all library services.

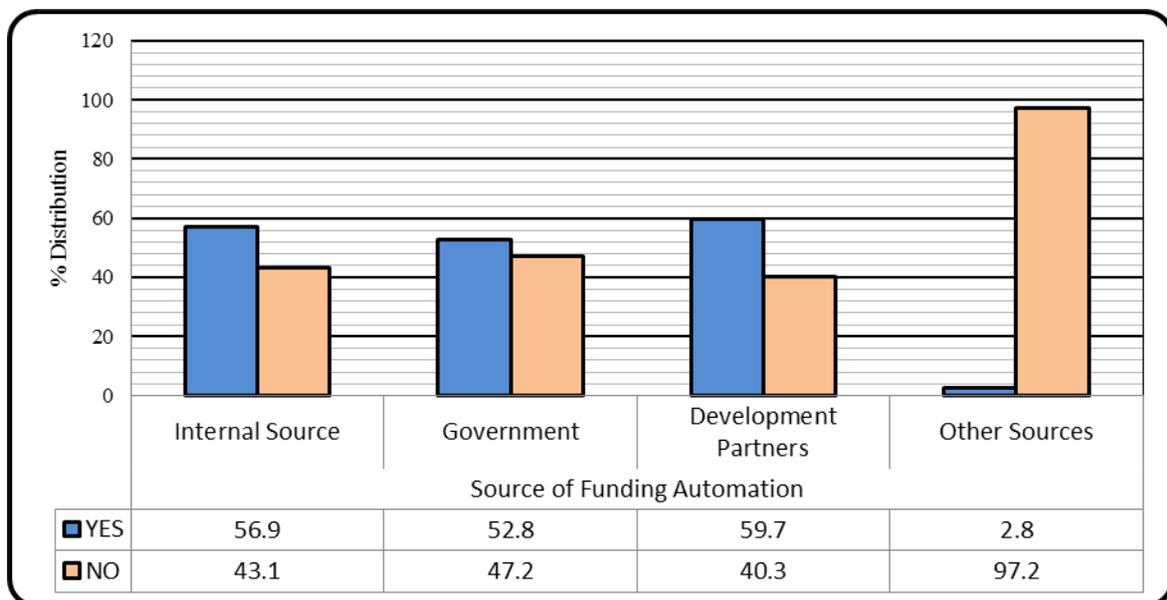


**Figure 1.1: Automated areas**

### Sources of fund for library automation

A source of funding is an important aspect in the sustainability of library automation. Without reliable sources of funding library automation is likely to be doomed. In this regard, libraries were asked about their sources of funding for automation. The responses show that 60 percent of the eight libraries had received their funding for automation from donors, 50 percent from the Tanzania government, 55 percent from internal sources and only five

percent of the responding libraries had received their funding from other sources such as student fees. Government funding and donor support appeared to be the main sources of funding for library automation in most of the public libraries surveyed. But there was still over-reliance on donor support when it came to library automation in the public university libraries, according to the respondents. The findings also compare favourably with the previous study by Manda (2003:4) who affirmed that donor support played a significant role in library automation but cautioned that the donor dependency syndrome had a negative implication for the long-term sustainability of library automation. For the sustainability of library automation, the parent institutions should prioritise the allocation of adequate funding including drawing from students' fees.



**Figure 1.2: Sources of Fund for Library Automation**

Source: Survey Data, 2014/15

**Library software used for automation**

Library software is a programme used to run the computer to produce the required results. In fact, it forms a backbone for the automation process in the library. It helps in performing housekeeping routines, information retrieval services in an efficient manner and supports resource sharing.

The study found that public university libraries used different types of software—both open source and licensed—to automate their functions. There were five different types of software used by libraries that responded. The results indicate the use of a variety of software by public university libraries surveyed. The following library software was used by libraries

surveyed: ADLIB, Koha, DSPACE, E-Print and ABCD. The study findings reveal that there was no universally available dominant library management software among public university libraries in Tanzania as every university had its own. These findings are in line with several other studies such as Malik (1996), Muneja (2010) and COSTECH (2012). On the whole, these studies affirm that standard library software was non-existent. This was a major issue of concern that hampered resource sharing.

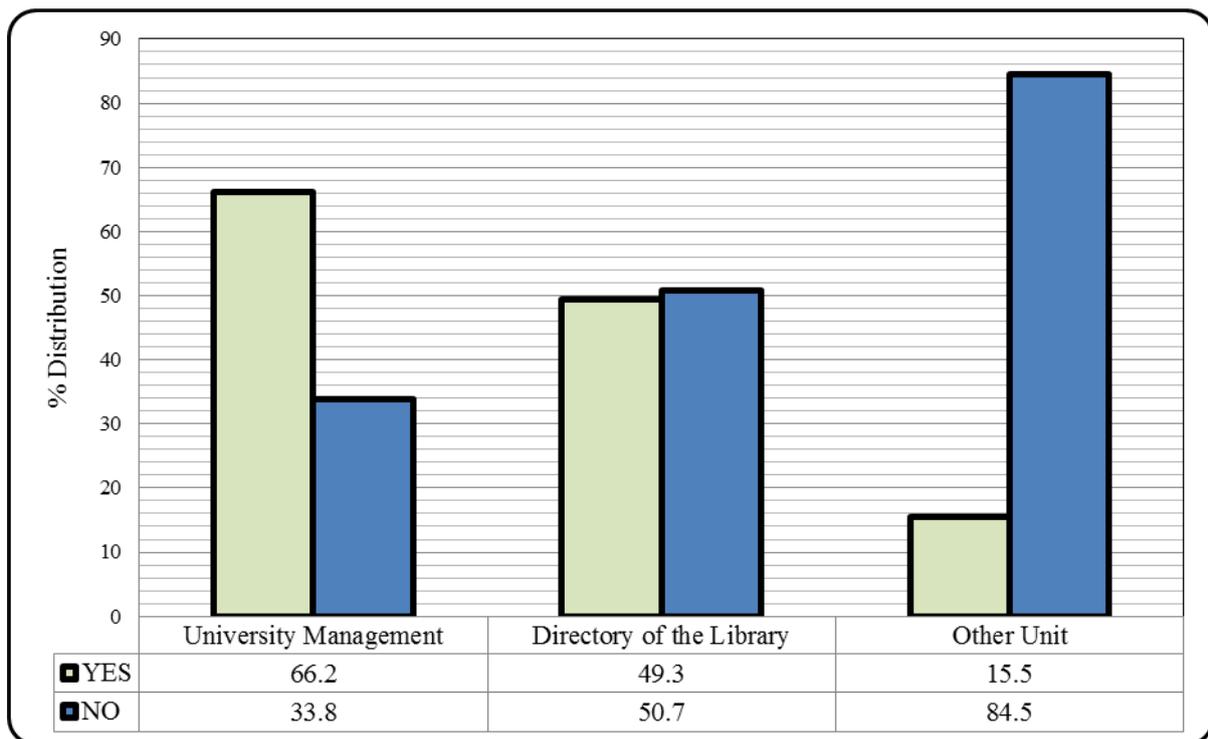
Therefore, to facilitate resource sharing among university libraries, there is an urgent need to come up with common software among public university libraries to facilitate the exchange of bibliographic information. On the choice of library software, the result show that three (3) public university libraries were using licensed software/commercial software and five (5) were using open source software. Incidentally, the results reveal that those universities, which were using licensed software, were supported by the SIDA/SAREC project and at the time of automation all these institutions were constituent colleges of the University of Dar es Salaam. These results demonstrate that many public university libraries (5) were increasingly using open source compared to licensed software (3). This might probably be caused by the fact that the ICT policies of universities such as OUT encouraged the use of such software. On the other hand, inadequate funds to purchase and maintain the commercial software also contributed to this scenario of less use of licensed software. After all, those libraries using commercial software were funded by external partners. Table 1.3 presents a summary of the libraries' responses on software:

**Table 1.3: Types of library software used**

<b>Types of LMS Software Used Cross-tabulation</b>			
<b>SOFTWARE</b>	<b>NAME OF INSTITUTION</b>	<b>No.</b>	<b>Remarks</b>
<b>ADLIB</b>	University of Dar es Salaam, Muhimbili University of Health and Allied Sciences and Ardhi University	<b>3</b>	Commercial software
<b>KOHA</b>	The Open University of Tanzania, State University of Zanzibar and Dodoma University	<b>3</b>	Open software
<b>ABCD</b>	Mzumbe University and Sokoine University of Agriculture	<b>2</b>	Open software
<b>E-Print</b>	The Open University of Tanzania	<b>1</b>	Open software
<b>DSPACE</b>	Muhimbili University of Health and Applied Sciences, Mzumbe University	<b>2</b>	Open software

### Stakeholders involved in identification of software

The study was also interested in establishing the stakeholders involved in the identification of software for use in their respective libraries. Indeed, for library automation to be successful it needs the involvement of different categories of people from different units. The findings show that there was wide involvement of various university decision-making organs such as management (62%), directorates of library services (49.3%) and other units (15.5%). The findings imply that librarians, who were important players in making automation successful, were involved in the process and this created a sense of ownership among library staff. The findings were consistent with those of Manda (2003:13), who found a high level of co-operation between the important stakeholders such as management, library, consultants and other units in the selection and procurement of suitable hardware and attendant software was the main determinants of the success of automation. Figure 1.5 shows the stakeholders involved in identification of library software:

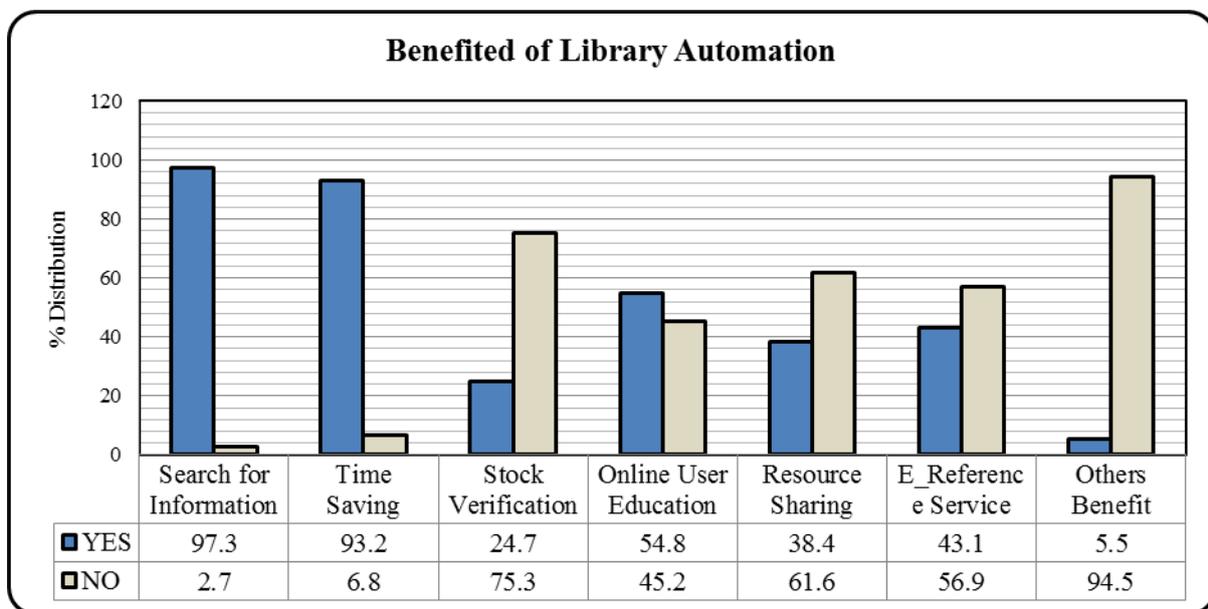


**Figure 1.5: Stakeholders' Involvement in the Procurement of library software**

Source: Survey Data (2014/15)

### Benefits accruing from automation

The study also sought to establish the benefits resulting from library automation. Data in Figure 1.6 illustrates the benefits resulting from such automation. Through interviews with the directors of libraries it was revealed that automation had benefited them in various ways. As one Director of a participating Public Library pointed out: “Increasing the efficiency and effectiveness in managing and providing improved library information services, to manage daily library activities and services, especially in the areas of acquisitions, cataloguing, circulation and security” (Director,2014/15). Another Director said: “It improves the image of both the library and librarians in this world of ICT” (Director, 2014/15). Generally, the study findings show that library automation had simplified the work of librarians, improved the library services on offer and enhanced the image of librarians in the information sector. Figure 1.6 depicts the benefits of library automation:



**Figure 1.6: Library Automation Benefits**

Source: Survey Data (2014/15)

### **Barriers facing library automation**

Proper automation planning entails reviewing the problems public university libraries face and the extent to which they could affect library users and the attendant benefits that could accrue from the resultant automation. Respondents were asked to indicate the barriers militating against the automated services in public university libraries. They indicated that most of libraries (88.6%) were facing problems of small bandwidth erratic power supply (78.6%), inadequate training personnel (70.0%) and equipment failure (60.0%). The results are summarised in Table 1.4:

**Table 1.4: Barriers to library automation**

	<b>Post-automation Problems Encountered</b>				
	<b>Erratic Power Supply</b>	<b>Equipment Failure</b>	<b>Small Bandwidth</b>	<b>Inadequate Trained Personnel</b>	<b>Other Problems</b>
YES	78.6	60.0	88.6	70.0	4.3
NO	21.4	40.0	11.4	30.0	95.7
Total	100.0	100.0	100.0	100.0	100.0

Source: Survey Data (2014/15)

Findings from the interviews with eight (8) directors of libraries revealed the following barriers of automation in the provision of library services. These included lack of adequate funding, staffing, lack of trained staff in automation, electricity supply, inadequate bandwidth, support and commitment from the management, lack of infrastructure, and choice of the software. Other barriers reported by the directors include bureaucracy from their parent institutions, poor infrastructure which includes poor connectivity and low bandwidth as obstacles to library automation. As a result, users had to contend with slow internet, which in turn slowed down the process of accessing information. Additional barriers indicated were those related to unreliable power supply and—to less extent—support from the management, lack or absence of policies to guide library automation in respective university libraries, lack of awareness of the importance of library automation, inadequate financial and human capital resources, over-dependence on donor support (Director of Library, 2014). Similarly, another director opined:

There was a problem of depending on the system administrators from the Directorate of ICT who at a time do not respond on time in case the system had a trouble because they have other equally important assignments to accomplish in their respective Directorates (Director, 2014).

Additionally, another director explained that there was a problem of applying commercial software, which were not only expensive to acquire but also to maintain on a sustainable basis (Director, 2014).

These findings, despite being collected from different geographical locations and contexts were comparable with those of Amekuedee (2005) who conducted a study on library automation in Ghanaian institutions and Ossai-Ugbah (2010) who carried out a study on the impact of automated library services and usage on students' academic performance in

Nigerian university libraries. Both of these studies established that the automation process of most libraries were constrained by lack of funds, limited support from the university management and lack of skilled staff to foster and sustain automation. In the same vein, they found that slow internet speed limited access and library facilities failed to live up to the expectations of the information users at all times.

The study also sought solutions and suggestions for problems facing library automation in Tanzania's public universities. The findings from the interviews with the directors of the public university libraries suggested a number of solutions to ease the problem of library automation thusly:

- (i) Increasing in funding through government budget and student fees and reduction of dependence on donor support which sometimes is unreliable and comes with conditions;
- (ii) Shifting to open source software;
- (iii) Training or employment of ICT library-based staff dedicated to the library to help trouble shooting cases;
- (iv) Encouraging the use of indigenous ICT programmers to create a library information management software for local use rather than depending on other companies which have expensive software and do not share expertise with the locals; and
- (v) Strengthening of bandwidth for speedy access to library systems with automated data.

### **Conclusion and Recommendations**

The paper has discussed, albeit impressionistically, the status of library automation in Tanzania's public university libraries. Based on the results of this study, it can be concluded that significant progress has been in library automation among the country's public university libraries. Among the most important findings of the study was that most of the library functions have been partially automated to facilitate speedy library operations. These trends suggest the need to automate fully all library functions to expedite the management of daily library routines and enhance efficiency and effectiveness in managing and providing quality library services. It was also observed that, donor dependence on automation remained a significant problem. This observation suggests that the government and public university managements should set aside adequate funds from fees, government subventions, grants and self-generated revenue to sustain library automation.

The study findings also reveal that bandwidth, which plays an important role in accessing information in an automated environment, was inadequate and this called for the Tanzania government to increase investment in infrastructure which support higher bandwidth and also subsidise the costs for use of bandwidth for educational and research institutions.

Another equally important observation of the study was the problem of operating commercial library software, which was very expensive to run. In consequence, some of the libraries have opted to use open source software. In this regard, indigenous ICT programmers should be encouraged to create library software for local use rather than depend on other companies vending rather expensive software.

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