

# Library Automation: The Role and Significance of Library Automation Plans

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**Abstract:** *Library automation is gaining momentum in African countries particularly in academic and research institutions. Library automation does not occur in a vacuum, it is driven by the benefits derived by users; a need to improve efficiency, performance and better access to information resources its transfer and communication as well as the delivery of quality service. Other factors revolve on the need to expand and accommodate new services such as the Internet, E-mail and CD-ROM resources. The paper however argues that in order to reap the benefits that automation brings, planning is crucial to guide the automation process and in determining hardware, software, staffing and training needs including the changing information and IT environment as well as the emerging new opportunities. Finally the paper stresses that adequate funding clearly articulated goals and objectives and involvement of a wide range of expertise from both within and outside the library is crucial in order to achieve desired goals. This paper is confined to highlighting critical issues that should be taken into account in planning and implementing library automation. The aim is to assist those at verge of venturing into library automation in Tanzania to understanding what is involved and the importance of an automation plan.*

## INTRODUCTION

Library automation has gained wide acceptance globally due to its many benefit potentials including improved performance, efficiency and delivery of quality service. Furthermore, it is increasingly becoming the means for providing access to global information resources and the introduction of specialised and expanded services. Hence Macías-Chapula, (2001:13) argues that: "The concept of library automation should be viewed in relation to efficiency in library management, quality of information services, efficiency of information retrieval, and circulation of library materials are relevant".

Library automation is a process, which involves linking computers electronically within and out side the institution, entering library resources in a database to create an Open Access Catalogue, which allows users to access and retrieve information in a timely manner. North America played a key player in library automation and 1967 was the pivotal year for library automation This period was characterised by the establishment of four major networks namely; the Research Libraries Information network (RLIN), formally Ballots, the Ohio College Libraries Centre (OCLC), the Western Library Network (WLN) –US and University of Toronto Library Automated Systems (UTLAS)- Canada. Today these organisations continue to be key players and leaders in library automation. It was not until the 1970's that

Library automation particularly bibliographic network services gained wide acceptance globally. Even today library consortia in North America and Europe continue to invest a great deal of money into in-house library automation systems, to ensure development of user-friendly automation systems, which facilitate access to global resources and cost effective (Rush, 1988).

#### **WHY LIBRARY AUTOMATION?**

Factors promoting library automation are numerous including the need to improve efficiency and performance productivity and delivery of quality service. For example, in libraries, automation has streamlined cataloguing, circulation and acquisitions functions including serials control (Mwaimu and Chiduo, 1989, Msuya, 1988, Mwinyimbegu, and Harthone, 1996) In addition, library automation provide users with unprecedented and fast access to information stored in regional and international databases including access to resources in other networked libraries, electronic journals and to full text articles and journal titles from various databases as well as access to other bibliographic services and resources. For example, computer-user interfaces linked distant locations tends to enhanced online access to library catalogues, searching and retrieval from anywhere including in the privacy of ones home (Braude, et al., 1995; Glitz, et al., 1992; Goundry, 1995; Ludwig, 1995; Miido, 1995 and Tedd, 1993).

Automated library systems linked databases can store large quantities of a wide variety of information resources and can be used to monitor library items in circulation and if networked those located in other libraries. Other reasons are in order to: facilitate fast access to information and its retrieval, cost reduction, eliminate unnecessary expensive services, improve record keeping, drudgery reduction of repetitive clerical jobs, increase job satisfaction and job enrichment, streamline library functions. Also to accommodate expanded and specialised library services; and finally to strengthen security of library resources Taken in this context, library automation responds to evolving library management practices, storage and space demands, as well as the evolving desktop culture and other needs and demands.

#### **WHY LIBRARY AUTOMATION PROJECTS FAIL?**

Libraries experience many problems during automation. For example, even among the pioneers there are examples of library automation initiatives which failed including the Atlantic University in Florida. Embarked on a very ambitious library automation programme in 1964, which proved to be a failure according to Rush, (1988:8) this project failed not because it was too ambitious, but because the developers were ahead of their time in terms of technology, application of software development, and due to underestimation of costs and time requirements and also due to resources constraints in terms of money, people and expertise.

Between 1965 and 1973 the Massachusetts Institute of Technology (MIT) embarked on three automation projects namely, Project MAC, Project Intrex and the Technical Information Project, which were designed to “make access to resources of the engineering library easily accessible to MIT students and staff”. However, these projects failed due to poor design and inadequate technology for intended tasks. Basically, the technology was over taken by new advancements in area. Another library automation project initiated by the Association of the New York Librarians for Technical Services (ANYLTS) also failed due to inadequate funding. However, there also notable successes including those of the Ohio College Libraries Centre (OCLC), the Western Library Network (WLN) –US, and University of Toronto Library Automated Systems (UTLAS).

In summary, a library automation is also likely to fail if it is too ambitious, poorly planned, poorly designed and if little consideration is given to what tasks it is expected to perform including under-estimation of implementation costs, time, hardware and software application requirements, including poor knowledge and lack of technical expertise, and technology obsolescence. In some cases they fail where librarians demand for tailor made systems that meet their specific needs instead of opting for existing standardized systems available in the marketplace. Similarly due to lack of ability to assess products offered by vendors and also where exact needs and requirements are not properly communicated to vendors. For example, Drenstooft (1988) for example argues that: “Librarians have inadequate understanding of technical issues and planning processes, and also unrealistic expectations, declination to change manual systems, reluctance to assume responsibility for major automation decisions, or insensitivity to ethical issues”

It is also true, lack of standardized, efficient and flexible systems also result in libraries adopt different operation standards. This also tends to increase costs for training and retraining, database creation, repairs and system maintenance, documentation and investment in developing hardware and software components. Therefore, librarians must understand the economics of automation, particularly the need for long term plans, replacement and sustenance costs. However, selection of a system (s) should be based on the value or what a system can offer and not on perceived costs

#### **THE LIBRARY AUTOMATION MARKET PLACE**

The library automation market place is fragmented and not well structured. and serves only a small specialised clientele which include academic, public, special or research libraries. Which differ in size and population they serve. Hundreds of computer-based products are offered to libraries by vendors every day, which range from simple micro-computer-based software packages to large integrated maxi computer systems.

Unfortunately, library personnel in African countries including Tanzania often lack the technical knowledge and experience needed that would allow them to negotiate with vendors or assess products offered to them by vendors. Involvement of a wide range of expertise is also crucial during planning and prior to the purchase of the system. Similarly, it is important to use a consultant with a combination of technical, business, management and operational expertise and experiences.

The library automation market place is also characterised by inertia. For example, it takes a long time for the initial contact between vendor and customer. Usually by the time a decision is made the concerned library may find that prices have gone up, vendors have lost interest or the technology has become obsolete, and has been replaced by new sophisticated and expensive technology. In view of all these factors an automation plan to guide the automation process, and facilitate determination of what the technology is expected to do, staff requirements and training needs, budgeting and also in order to minimise delays.

#### KEY FACTORS IN LIBRARY AUTOMATION PLANNING

According to McGee (1988) library automation planning is both an organisational and social process. On the one hand from the organisation point of view, the planning process is the basis for determining both long and short-term objectives, goals and requirements, the budget as well as schedule estimates. On the other hand from the social process point of view, library automation planning is the basis for understanding what is involved. This also requires clearly articulated goals and objectives once this is achieved acceptance and approval can be guaranteed. The process also involves getting support from decision makers, implementers including those who are likely to be affected by the decision to automate.

During the planning process librarians must understand and familiarise themselves with the different systems available in the market place. This can be done through demonstrations or site visits. Librarians must be very clear about what they expect or want the system to do and should clearly distinguish between necessary and desirable requirements. Basically this means prioritising their requirements based on current existing technology and not older technology, which may become obsolete by the time they decide to automate. At this stage technical specifications should be left to the specialists such as library systems analysts and developers.

It is always advisable to hire a competent consultant with a combination of technical, business, management and operational experience whose key role would be to provide advice and assist the librarian maintain the focus in terms of efficiency, fairness and objectivity and to facilitate information exchange. This stage is crucial in ensuring mutual understanding between the librarians and vendor regarding what the expectations of the librarians and how these can be met.

It is also important for librarians to have basic knowledge and understanding about automated information systems prior to embarking on automation and to be very clear about what they expect the system to do and what software applications they need to achieve their objective. This is because during the planning process, the librarian is likely to be flooded with advice from people who know nothing about automation. The librarian must understand that ultimately, the decision to automate and acquire technology is their responsibility.

### **The need for Clearly Articulated Goals**

Library automation requires clearly articulated goals, objectives including sound decisions on the WHY, the HOW and WHEN. It also involves making informed choices and ensuring that there are adequate resources to achieve desired goals and priorities. However these can only be made if librarians have a clear understanding of what they want the system to do. For example is their concern to improve efficiency and delivery of quality service, or is it to improve access to information and retrieval?

### **Funding and the Project Budget**

No automation project plan can be undertaken, successfully accomplished or implemented without adequate funds. Under-budgeting can lead to failure. Library automation must take into account recurrent costs for new technology, updating or replacement of obsolete technology and software applications, staff training and retraining and must be undertaken annually.

### **Library Automation Plan**

The automation plan is an important aspect of the planning process and a basis for determining both short and long term needs and growth potentials of the systems including the type of system to be implemented. While there are different ways to plan library automation, however, a well-designed library automation planning process requires involvement of key staff right from the onset in the identification of needs, requirements, goals, objectives and the actual expected outputs. Therefore aspects must be clearly defined.

The automation plan must also clearly state the type of system to be implemented. For example, will the system be integrated or modular? For example, an integrated system is a package consisting of all library house keeping functions or operations, which can be purchased as a full blown, complete, turnkey package ready for use. In the case of a modular system, it basically means automating particular functions at a time such as either the acquisition module or cataloguing module followed by others such as the serials module etcetera. The choice of which module to start with would depend on the priority given to individual functions.

## **DETERMINING REQUIREMENTS**

Automation can be costly and time consuming due to the time involved in retrospective conversion of data. Therefore, before converting from manual to automated library systems, the library must determine or prepare a set of requirements which should clearly state the functions that they expect the system to performed (i.e. the HOW) including what the library hopes to accomplish. In this context requirements refer to functions that will be performed by the system. However systems specifications (i.e. the WHAT) or technical aspects such as computer system design, development or specifications (i.e. the WHAT) should be left to technical experts.

## **SYSTEMS IDENTIFICATION AND PRIORITISATION**

Library managers must be clear about their priority concerns and why they need to automate. Usually these priority concerns revolve around the need to improve circulation services, acquisitions, serials control, and the need to provided access to global resources through the Interne. A clears understanding and articulation of these issues is crucial and would assist librarians to select systems that would support their priority functions. This means they must understand clearly from the start the difference between requirements and specifications and must be realistic about their expectations in terms of what they expect the proposed system to do or accomplish and must take into account the systems limitations and capabilities.

Before a decision is made to procure the system, library managers and staff must familiarise themselves about the wide range of systems available in the market place. The purpose here is to ensure they have adequate knowledge and information about available options including the systems capabilities and limitations. This can be acquired through: extensive reading, attending exhibitions and demonstrations of systems, site visits to observe systems in operation and also by visiting other libraries that have already automated to learn from their experiences. It is also important to talk to vendors about the strengths and weaknesses of various systems and to get their views about available suppliers in the market place.

## **FACILITATING WORKING RELATIONSHIPS**

A key role of an automation plan is to facilitate clear lines of communication, understanding and good working relations between the library managers and the vendor. This must be accompanied by a comprehensive and detailed set of requirements which the vendor must meet before they can be contracted for the automation project.

Essentially, the requirements should include; the vendor's performance track record, legal issues involved, financial requirements, ethical considerations, expectations as well as required standards. Furthermore, the plan must also

clearly spell out the size of the projected databases, number of initial and anticipated terminals required, how the terminals will be used, initial types and transactions to support education and training requirements. In addition, the plan should provide details about the physical location of the system, environmental constraints, the anticipated implementation schedule as well as acceptance testing requirements.

In this context, the requirements must be clearly articulated and understood by both library managers and vendors because this would help librarians to identify, prioritise, evaluate and select the most appropriate system based on their needs, functions and clearly defined goals and objectives. These are also important reference points during negotiations with vendors and when modification of the original plan is needed (Griffiths, 1988) Vendors also need these guidelines to determine hardware and software requirements including personnel, communications and support services needed to meet performance specifications. Thus, preparation of guidelines or detailed requirements is not only a process but also an educational or learning experience for both library managers and staff. This is why involvement of staff in the planning phase right from the beginning is crucial.

#### STAFF AND STAKEHOLDER INVOLVEMENT

The most effective way for determining library automation needs and requirements is through a well designed institutional planning process involving all key staff in the identification of needs and goals of the planned automation systems and services.

This is because; library automation is a technically oriented process, which requires involvement of a wide spectrum of expertise and stakeholders. Their involvement, full support, approval, acceptance and consensus, is of crucial importance in determining not only its viability but also in achieving desired goals and objective but also its sustainability and effective use (Barnett, 1994). Moreover, staff both junior and senior are key actors in the planning, implementation and evaluation of information systems as well as its success. In view of this, their commitment, attitudes before and during implementation is important including their training and retraining.

Planning for automation also requires involvement and active participation of top leadership within the parent institution, the board, and computer experts and consultants. As indicated earlier, automation is costly and therefore only if stakeholders were convinced of its benefit potentials would they support, approve and provide the needed funding or go ahead.

## **STAFF DEVELOPMENT AND TRAINING**

A key factor to successful and implementation of library automation, its effective use in the management and delivery of planned services are trained staff and technical personnel to guide both implementation and effective use.

Since technology tends to have unintended consequences such as loss of jobs as machines replace humans, therefore, staff must be educated on the concept of library automation, the purpose, and why change is necessary particularly for those who are likely to be affected and in order to create awareness and in order to demystify the technology. Similarly, staff whose jobs are taken over by automation can be utilized in retrospective data conversion.

At this stage staff that would conduct the training, orientation and education of staff and users would have to be identified to prepare the in-house training programme. Continuing education and training and retraining should be an integral part of the automation process and should be provided on a regular basis in order to keep them abreast of new developments and so that they can effectively manage technical change.

Training and retraining should also be viewed as a means for increasing the pool of library automation expertise.

## **KEY ACTORS IN LIBRARY AUTOMATION**

Library automation is complex and requires a wide range of expertise during before and during planning and implementation. Therefore during these processes a review, evaluation and negotiation including and the library management teams as well as the automation task force should be constituted. Their roles and responsibilities should be clearly defined.

### **The Review Team**

A key role of the review team is to define project goals, objectives and systems requirements. The review team should comprise of key individuals including library managers, board members, IT experts, policy makers and library technical personnel.

### **The Evaluation Team**

This could comprise of the same members or a sub set of the review team. Their key role would be to evaluate proposals sent in by vendors applying to undertake or implement the automation project.

### **The Task Force**

This should comprise of staff, from different departments within the library such as cataloguing, circulation, periodicals, reference, acquisitions, special collections, subject specialists etcetera.



### **Negotiating Team**

At one stage the library will have to negotiate with vendors, consultants and other experts. Therefore the library must have a negotiating team. Members can be drawn from the evaluation team or other departmental representatives. The key responsibility of the negotiating team is to negotiate on behalf of the library on the best bidder who should implement the automation. Most libraries for example in Tanzania lack people with negotiating skills or capabilities. In view of this libraries should cultivate these skills.

### **The Library Management Team**

The role of the library management team is to ensure the successful implementation of the automation programme and its assimilation into the ongoing management system and governance as clearly spelt out during the planning process. This team should also inform staff on the progress made, constraints encountered and how these are dealt with.

### **Selecting a Vendor**

Every library has its own unique needs and priorities. Prior to procuring a system it is important to shop around for the most qualified and experienced vendors based on their track record. Basically, a key role of the vendor is to help the library in determining infrastructure requirements both during and after the planning stage, to define and articulate the problem which automation is required to address, determine staff needs and to assess financial resources. Similarly, to prepare the project budget and basically to assist the library with other technical issues that they may not be aware of, such as systems performance evaluation. In this respect it means adequate resources should be set aside to facilitate evaluation of existing vendor systems to help the librarian select the best system that meets library needs and proposed functions.

### **BRIEF DISCUSSION**

In the context of African countries including Tanzania, library automation is a recent phenomenon. The level also differs from country to country, depending on the level of economic development and level of awareness on their potential benefits. It appears in the new changing environment and due to globalisation it appears library automation is inevitable. Not only is automation closely associated with improved provision of quality service and its delivery but also improved performance and efficiency. It also provides unprecedented opportunities and access to new products and services.

### ***Library Automation Initiatives in Tanzania: A Brief Overview***

Few libraries in Tanzania are fully automated. These include, the University of Dar es Salaam-library, the British Council and the United States Information Services libraries. Sokoine University library is in the process of automating

some of its functions. A few special libraries such as, the Economic and Social Research Foundation (ESRF) library and the Research on Poverty Alleviation (REPOA) libraries are automated. The Morogoro Public Library has computerised some of its functions but currently it has been forced to suspend this project due to financial and technical problems. This is a typical example of library automation that is donor driven and financially dependent. As such its survival and sustenance is dictated by availability of continued support from donors. This is also because parent institutions in such cases rarely budget for such projects or their sustenance. It is possible, there are several isolated library automation initiatives in the country but it is difficult to determine the numbers due to lack of information. And in any case this is beyond the scope of this paper.

### ***Factors Constraining Library Automation in Tanzania***

As more and more academic and research libraries including schools and colleges in Tanzania are thinking of automating their libraries or resources centers, it is important to understand not only what automation is all about and why it is necessary what it entails, its benefit potentials, constraints but also the importance of an automation plan. Costs involved in library automation for both hardware and software applications including peripherals largely depends on the level of automation required.

There are numerous factors that may deter library automation in the context of Tanzania, including policy, financial and infrastructure constraints, low level of IT expertise and awareness of the benefit potentials including expensive telecommunications systems and services. The lack of a strong national information infrastructure and small library automation marketplace for hardware and software including peripherals are also important factors. Other problems relate to the unintended consequences of technology, for example, are displacement of people by machines. Thus fear that most people would lose jobs may act as a barrier to automation. While this may be true to a large extent, however there are tasks, which still rely heavily on humans at every step of the process for example, acquisition, technical processing, circulation and reference services.

Despite these draw back where properly planned and implemented, library automated systems can become the basis for improving the quality of services offered and its delivery to users, introduction of expanded services including access to the internet and CD-ROM resources, resources sharing as well as a basis for developing the needed technical expertise. For example the problem of inadequate expertise can be alleviated by training staff prior to the implementation itself and through in-house training and training offered by software vendors during implementation

## **Benefits of Automation**

Library automation benefits are numerous and varied and therefore, library automation should not be viewed as an end in itself but a means to an end. For example, library automation tends to create new opportunities: to access web resources and the internet which has also revolutionized the information environment by allowing subscribers access to a wide variety of public domain databases and services, including document delivery, access to electronic journals, reference and bibliographic resources, free public domain e-mail as well as access to indexing and abstracting services and scholarly works and research. Furthermore, automation makes it easy to generate library statistics and to keep track of items in circulation. It facilitates enhanced searching, speeds up, task performance, simplifies and eliminates routine tasks and allows the sharing of Union catalogues. In addition it facilitates collection development, frees cataloguing time and tends to reduce the amount of time spent to order and process materials.

## **The Internet**

The Internet is increasingly utilised by publishers to provide access to content pages of journals including full text articles. In addition it has opened up new electronic publishing opportunities, including the fast communication and transfer of information and the opportunity for scholars and researchers including students and individuals to network with their counterparts globally. It also facilitates distant learning and increases the library's ability to handle large interlibrary loan requests and tend to increase user confidence.

## **CD-ROM**

Automation provides opportunities for libraries and information related centres the opportunity to introduce CD-ROM services and products. One major advantage of CD-ROM lies in their ability to conserve space, provide multiple user access to other network environments. CD-ROM collections can also help to prevent mutilation of library materials, and allows researchers to download data sets for further data analysis.

## **Email**

Email services are also another form of product and service derived from automation. A major advantage of E-mail facilities is that they can help to down on cost and the time it takes to send reminders to publishers, technical services support personnel including users. It also facilitates easy communication between staff. Public domain e-mail software applications are also available free of charge and therefore the library does not need to incur additional expenses for this facility. Apart from cost reduction, library automation can also generate income for the library by offering for E-mail services for a fee.

## CONSTRAINTS

One major problem library automation faces in the context of African countries is that there is too much heavy dependence on donor funding. As a result recipient countries are more concerned with acquisition of equipment while the actual planning and training of staff takes place much later. Therefore, unless these institutions have staff that are conversant with library automation process opportunities provided by automation may not be realised due to lack of knowledge and understanding on its benefit potentials. Similarly, modalities for sustaining the technology using local resources must be taken into consideration.

Implementation selection, conversion and maintenance of library automation is not only costly but time consuming and also in terms of the time it takes to train staff.

A key factor to accessing automated library resources is steady power supply. By contrast in Tanzania power cuts and fluctuations are the every day reality. When there is no power arguably the system will not function and therefore one cannot access resources on the Internet, or receive or send interlibrary loans electronically, let alone access the Open Access catalogue. Therefore whether the manual catalogue should be discarded requires greater thought and consideration. It is also difficult to keep up pace with the information explosion including unsolicited junk mail and computer viruses.

## CONCLUSION

To conclude, ICT use and application in libraries has changed the library environment not only in the way resources are organised and managed but also their access and retrieval. This has resulted in efficiency and quality performance. Thus given the wide range of technology products available in the market place it is crucial for librarians and other information workers to keep abreast of new developments in both hardware and software applications and to maintain contact with computer experts in order to select the best system available that can support anticipated functions such as improved access to library collections.

Library automation, planning, evaluation, and preparation of guidelines and requirements are both social and organisation processes and requires full involvement and participation of staff, experts and other stakeholders. It is also an enriching education and learning process. Implementation of a library automation system should be bottom-up, rather than top-down and every effort should be made to reach consensus in the redesigning or reorganization of the library. To create space for automated systems including the selection of the automation system is critical to the success of any project, and in order to ensure acceptance, reduce technophobia and achieve desired goals.

Technology resistance by staff is a common phenomenon and basically stems from fear of losing jobs and low level of education. Age is also a factor. Rome was not built in a day. One should not bank on miracles. A certain degree of tolerance and encouragement may be necessary and with time and fair access to both on the job and formal training opportunities the laggards may sooner or later join the bandwagon. Visits should also be organised for staff so they can get exposure and learn from experiences of libraries that have automated. In addition staff should be provided an opportunity to participate in conferences, workshops and short courses that focus on automation or IT in general

Evaluation should be an integral part of the library planning and automation process and in order to achieve desired set goals and objectives, and also to ensure proper implementation within the set timeframe. It also provides staff the opportunity to exchange and share views and information on progress made, constraints and challenges (i.e. what worked and what did not work, why and how). Evaluation can be done through regular staff or board meetings or in the case of UDSM libraries during Senate library Committee meetings.

Last but not least, seek the services of a consultant to help you think through the process and ensure you are in line with the required objectives. The role of the consultant is to educate and assist library staff, the review team, task force and planning team to comprehend technical aspects of library automation, the automation market place, products and services offered systems requirements and training needs. This would save the library both time and money.

Finally, technology is not an end in itself but a means to an end, and as a tool to facilitate the efficient and effective delivery of planned or envisioned services as spelt out in the library objectives and in line with the mission of the library. Automation should also be evaluated by benefits derived by users.

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