Selection Criteria for Computer Software and Hardware: A Case Study of Six University Libraries in Nigeria

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ABSTRACT: This paper investigates the criteria used in the selection of computer hardware and software in six university libraries in Nigeria. Six (6) copies of a questionnaire were sent to selected librarians in Edo and Delta states, Nigeria. All copies of the questionnaire were retrieved. The data collected were analyzed. The findings reveal that the respondents took into consideration such factors as memory, speed, capacity, durability, costs, reliability and standardization, brand and manufacturer, warranty, and scalability of the system before procuring computer hardware. The respondents also take into consideration the reliability and track record of the vendor, service and technical support, previews or sample sections, compatibility with other programs being used, product cost, and data migration before procuring computer software. It is also noteworthy that the respondents have encountered with electricity failure, improper implementation, and difficulties to get qualified personnel to maintain and/or repair computer hardware when it was broken down.

I. Introduction

A computer can simply be defined as a programmable machine that can store, retrieve, and process data. (Britannica Concise Encyclopedia, 2010)

The computer comprises two parts, hardware and software. The former is the tangible parts of the computer, such as disks, monitors, boards, keyboard, and mouse. The hardware does all the physical

work of the computer, from memory storage to display. The software acts as the brain of the computer, telling the hardware what to do and how to do it.

Computer software is intangible and can be grouped into two categories: a) system software and b) application software. (Askdeb.com, 2010)

This study will focus on computer hardware and library application software that enable librarians to perform specialized tasks such as library automation. Examples of such specialized application software are; Alice for Windows, GLASS, CDS/ISIS, Strategic Library Automation and Management (SLAM), Liberty, Tin-Lib, and X-Lib.

The selection and use of appropriate computer software and hardware to carryout library operation is a challenge. Lack of time and experience to make good decisions about particular products can make the selection a daunting task. Oketunji (2006) noted that today there are so many software packages in the market, designed for libraries, information and documentation centers. A comprehensive list of software packages for librarians have been compiled by Tyler and Grunson, (1998), including mastalib, Alice, GLASS, X-LIB, and CDS/ISIS. In Nigeria, most of the federal universities have one version of the tin-lib or another. In 1993, the national university commission (NUC) of Nigeria recommended the tin-lib to all the 36 federal university libraries. Many of these libraries have procured the package despite the fact that some did not have any computer system to install it (Oladapo, 2005). Library management system software used in Nigerian academic libraries includes CD/ISIS, X-lib, Glass, and Alice (Abdulraheen & Tiamiyu, 2005).

Oduwole (2005) found that 16 federal universities have automated their cataloging processes using the TIN-LIB software. Libraries such as Nigeria Institute of Social and Economic Research (NISER) and the Institute of French Research in Africa (IFRA) library within the University of Ibadan use CDS/ISIS (Ezomo, 2003). Other library management software use by some international research libraries is Inmagic DB/TextWorks (Adedigba and Ezomo 2003). The library and documentation center for the International Institute of Tropical Agriculture (IITA) in Ibadan presently uses Inmagic DB/TextWorks for all library functions. The most important decision to be considered in a library automation is the selection of software to use. According to Ciberalli (1996), "the rule of the thumb for automation used to be to select the software first, and then hardware selection would be narrowed to the computers on which the software could operate. It must be noted

that the greatest computer in the world is of little value if the software one needs to run the computer is not available".

II. Objective of Study

The objective of the study is to find out:

- What are the factors taken into consideration before procuring computer hardware?
- What are the factors taken into consideration before procuring computer software?
- What are the problems encountered?

III. Literature Review

Technology Group International (2004) listed a set of hardware selection criteria: Compatibility and industry standards, Ease of operations, and Support cost.

Oketunji (2006) suggested a set of necessary criteria for selecting software: Enable users to do something they couldn't otherwise do, or to do things better or more efficiently; Is multi-purpose, versatile, and open-ended; Appeals to a wide range of ages and interest;, Is easy to use; Offers constructive feedback (both positive and negative); Encourages creative, individualized, original input; Enhances content through electronics presentation; Provides audio help and/or instructions, or, where on-screen, help is clear and useful; Employs tasteful and attractive graphics that are non-violent, free of gender or ethic stereotypes; Representatives of user population; Provides a tangible product; Is fun to use and gives user a sense of accomplishment. He went further to say that librarians should avoid software that: Limits user interaction to pressing the return key or making a choice between presented options; Requires simultaneous depression of several keys in order to accomplish a routine or frequently used function; Has large amount of text on the screen; Does not allow the user to control sound levels, timing, or other intrusive features; Presents content in a violent, racist, or condescending fashion; Duplicates experience that-is just as easily or more easily presented in another medium or through a more versatile software product; Is little more than an automated workbook; Repeats exaggerated or lengthy graphics displays that have little to do with content. He added the following as guidelines for selecting software: Hardware connections, Your right in respect of the software, History of the supplier, Possibility of preview or demonstration, Pricing structure, Level of sophistication, Support issues, References sites, Parameterization, Teaching aids, System administration, and Needs for documentation.

IV. Research Scope and Methodology

The research population for this study comprised 6 librarians in academic libraries in Edo and Delta states, Nigeria.

The instrument employed for the collection of data was a questionnaire. The data obtained from the retrieved copies of the questionnaires were analyzed using simple percentages. Table 1 shows the institutions and their respective categories to which the respondents are affiliated.

Table 1: Respondents' Affiliation and Institution Category

SN	Institution	Category
1	Ambrose Ali university, Ekpoma	State
2	Benson Idahosa University, Benin city	Private
3	Delta State University, Abraka	State
4	Igbinedion University, Okada	Private
5	Novena University, Ogume	Private
6	University of Benin, Benin City	Federal
	Total	6

V. Data Analysis and Interpretation

Section A: Respondents' personal data

Table 2: Gender of Respondents

Gender	No. of Respondents	Percentage (%)
Male	2	34
Female	4	67
Total	6	100

The data in Table 2 reveals that there are more female librarians are 4(67%) than their male counterparts. This does not corroborate the findings of Adomi, Ayo and Nakpodia (2007) that there were more males than female librarians in the university libraries.

Table 3: Working Experience

Years	No. of Respondents	Percentage (%)
6-10	-	-
11-15	-	-
16-20	-	-
21 and above	6	100
Total	6	100

Table 3 shows that 6(100%) respondents have worked 21 or more years. This means that all of them would have had enough experience and exposure to computer software and hardware selection, which enable them to answer the questions in the questionnaire.

Table 4: Qualification of Respondents

Degrees	No. of Respondents	Percentage (%)
BA/BS/BLS	-	-
PgD	1	17
MA/MS	1	17
Ph.D.	4	66
Total	6	100

Note: PgD (Postgraduate Diploma)

Table 4 indicates that 1(17%) of respondents holds PgD, 1(17%) holds MA/MS, while 4(66%) hold Ph.D. respectively. The data indicates that all respondents have received post-graduate education.

Section B: Respondents' responses to questions:

1. What are the factors taken into consideration before procuring computer hardware?

Table 5: Factors in considerations for procuring computer hardware

Factors	Agree	%	Disagree	%	Uncertain	%
Brand/manufacturer	3	50	1	17	2	33
Memory	5	83	-	-	1	17
Speed	5	83	-	-	1	17
Capacity	5	83	-	-	1	17
Durability	5	83	-	-	1	17
Cost	5	83	-	-	1	17
Warranty	4	67	-	-	2	33
Technical support	3	50	2	33	1	17
Users manual/guide	3	50	-	-	3	50
Scalability of the system	3	50	1	17	2	40
Reliability of the system	5	83	-	-	1	17

Standardization of the system	5	83	-	-	1	17

Table 5 shows that 5(83%) of respondents took into consideration memory, speed, capacity, durability, cost, reliability of the system and standardization of the systems, while 3(60%) took brand/manufacturer, warranty and scalability of the system into consideration. This finding agrees with Tiamiyu (2005) who stated that speed, scalability of the system, reliability of the system, standardization, and PC technical support should be taken into consideration before procuring computer hardware.

2. What are the factors taken into consideration before procuring computer software?

Table 6: Factors in consideration for procuring computer software

Factors	A	%	D	%	U	%
Reliability and track record of the vendor	5	83	-	-	1	17
Service and technical support	5	83	-	-	1	17
Compatibility of software with current and future hardware	4	66	1	17	1	17
History/ availability of updates/revision	3	50	3	50	-	-
Preview/ sample sections	5	83	-	-	1	17
Compatibility with other program being used	5	83	-	-	1	17
Ease of operation and installation	3	50	3	50	-	-
Product cost	5	83	-	-	1	17
Data migration	5	83	-	-	1	17

Table 6 shows that 5(83%) of respondents take into consideration reliability and track record of the vendor, service and technical support, previews/sample sections, compatibility with other program being used, product cost and data migration before procuring computer software. However, 3(50%) considered compatibility of software with current and future hardware and ease of operation, ease of operation and installation before procuring computer systems software. This finding corroborates with Oketunji (2006), who listed factors to consider, such as hardware connections, rights in respect of the software, history of the supplier, possibility of preview or demonstration, pricing structure, level of sophistication, support issues, reference sites, parameterization, teaching aids, system administration, and needs for documentation.

3. What are the problems encountered?

Table 7: Librarians encounters the following problems

Problems	A	%	D	%	U	%
Improper implementation and test running	5	83	1	17	-	-
Epileptic power supply	5	83	1	17	-	-
Compatibility with existing hardware	3	50	3	50	-	-
Finance	3	50	3	50	-	-
Difficulty getting qualified personnel to maintain/ repair computer hardware when it breakdown	5	83	1	17	-	-

Table 7 shows that 5(83%) of respondents encountered electricity failure, improper implementation and test running, and difficulty getting qualified personal to maintain/repair computer hardware when it was broken down. The finding of this study supports Adomi and Anie (2006), who stated that electric power supply and connectivity is one of the problems librarians encounter in the use of computer.

VI. Conclusion

Based on the findings of this study, it can be concluded that during the selection of computer hardware, librarians will take into consideration such factors as the memory, speed, capacity, durability, cost, reliability, standardization, brand/manufacturer, warranty, scalability, and user's manual/guide.

To select computer software, librarians will look into such factors as the reliability and track record of the vendor, service and technical support, preview/sample sections, compatibility with other programs being used, product cost, data migration, ease of operations and installation

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