

**DESIGN AND DEVELOPMENT OF AUTOMATED RECORDS
MANAGEMENT SYSTEM FOR
KABOJJA JUNIOR SCHOOL LIBRARY**

BY

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**A Dissertation Submitted to the School of Postgraduate Studies in Partial fulfillment of the
Requirements for the Award of Diploma in computer science**

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DECLARATION

I **MAKUMBI SULAIMAN** do hereby declare to the best of my knowledge that this graduation project is my original work and it has never been submitted to any University or any other Institution. The literature and citations from other people's work have been duly referenced and acknowledged in the text, footnotes and bibliography.

Date:

28/07/2009

Name:

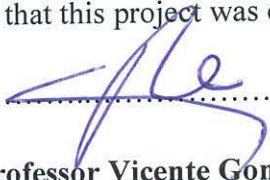
Makumbi Sulaiman.

Signed:



SUPERVISOR'S APPROVAL

I approve that this project was conducted and a report written under my supervision.

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Signed:

Name: **Ms. Ouma Maureen**

Date:

DEDICATION

To my dear parents, Mr. Nkabirwa Ismail (Programmer), also to my brothers for their patience, understanding and devotion during this study.

ACKNOWLEDGEMENTS

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LIST OF ACRONYMS

Admin	Administrator
ASCII	American Standard Code for Information Interchange
CAC	Cryptographic Access Control
CISSP	Certified Information System Security Professional
CD	Compact Disk
CD-RW	Compact Disk Rewritable
DAC	Discretionary Access Control
DBMS	Database Management System
DFD	Data Flow Diagram
DOS	Director of Studies
EFS	Encrypted File System
EMS	Electronic Management System
ERMS	Library Records Management System
FERPA	Family Education Rights and Private Act
GB	Gigabyte
GHz	Giga Hertz
GUI	Graphical User Interface
HP	Hewlet Packard
ICR	Intelligent Character Recognition
ICT	Information and Communication Technology
IT	Information Technology
LAN	Local Area Network
LMS	Learning Management System
MAC	Mandatory Access Control
MB	Megabyte
MHz	Mega Hertz
MIS	Management Information System
MS	Microsoft
OCAC	Originator Controlled Access Control
OMR	Optical Mark Recognition

PC	Personal Computer
PK	Primary Key
RAM	Random Access Memory
RBAC	Role-Based Access Control
RJ	Registered Jack
RDB	Relational Database
SID	Student ID
SQL	Structure Query Language
SAQ	Self-Administered Questionnaire
SPSS	Special Programmers for Social Scientist
KJS	Kabojja Junior School
KJSLRMS	Kabojja Junior School Library Records Management System
UPS	Uninterruptible Power Supply
VRAM	Virtual Random Access Memory
VB	Visual Basic

ABSTRACT

This research examined the challenges Kabojja Junior School (KJS) as learning Institution faces in managing the Library records and result production for students. At KJS, the current system of record keeping is mainly manual-based and hence making it vulnerable to loss or mixing of records, and sometimes leakages. Computerizing the Library records management was therefore target towards improving the existing current system to the new one that would keep records, and process electronically all Library documents for KJS. This would in turn lead towards obtaining timely, efficient, accurate, cost saving and error free students' Library records. The Library Record Management System (LRMS) is one of the most efficient systems that handle the Library records in terms of easy access to the records and also it is faster in the production of documents.

A short needs assessment for the intended users of the computerized system at KJS was done through interviews. These were done to the selected group of the school administrators and Academic staff who included: the Principal, Director of Studies (DOS), Head teacher, Class teachers (5) and selected teachers (6). The main objective was to determine if the proposed computerized system would be considered important in improving the efficiency of the Library records management system currently in use. Results obtained showed that 87.5 % of the total persons interviewed expressed the strong need for the automated system to be put in place.

This computerized system now known as Kabojja Junior School Library Records Management System (KJSLRMS) was built on the MsAccess based network environment where computers running on the school's Local Area Network (LAN) was used in the study to cover the Library records capability. These client PCs were positioned in various offices that could access the network for the ease of record processing.

For the system to run efficiently stable power supply should be in place. An experienced system manager is also required to help the management of the system. Trained users of the system will help in the smoothing running of the system. In future, the use of KJSLRMS could be expanded to computerize all the records at the school beyond the Library ones.

CHAPTER ONE

INTRODUCTION

1.0 General Introduction

The current system of record keeping at Kabojja Junior School is still manual-based, spreadsheet applications as academic record processing program is used instead of a centralized database management system that ensures data security, integrity, and provides faster data processing capability and hence making it vulnerable to loss or mixing of records, and sometimes leakages.

Computerizing the system is a target towards speeding up the whole process; from entering all library information, storing results up to production of useful related administrative documents like library statements, Stock movement reports, Stock summary.

1.1 Background of the Study

Kabojja Junior School [1] (KJS) is a day; private primary school that was established in 1996. KJS is located in Kololo Accacia Avenue just after the Voice of Africa Radio. It is about 6 kms from Kampala city. The mission of KJS is “to provide an environment that enables the cultivation of competence, confidence, creativity and character in the academic and social interactions”. The school’s philosophy enshrined in the motto “Strive to achieve” aims at developing human potential to excellence, integrity, teamwork and cooperation.

At present the system used for managing Library is a manual one. The librarian simply writes down the students and teachers borrowing and returning library records. The papers are stored in the open shelves. The accounts department is responsible for verification of payments for students that have lost Library books.

1.2 Statement of the Problem

Despite that Library Record Management System (LRMS) is one of the most efficient systems that handle the Library records in terms of easy access to the records and faster in the production of documents. The system for managing the Library system in Kabojja Junior School is fragile whereby library records are manually counted and the librarian enters them into the Excel spreadsheet for storage; these results are then forwarded to the office of the DOS for final record storage. In most cases, the storage mediums of data are either through floppy diskettes, memory sticks, or printed copies. All these run into the risk of being lost or corrupted by the computer

viruses (in the case of memory sticks and floppy disks). Again, the excel program is not necessarily the best data storage mode and more so when the school do not have an efficient backup data storage system. Also there is a great risk of machine breakdown leading to data loss. The whole process is more of stand-alone computer based leading into delays more especially during the final preparation of documents when arranging the results. This has affected the well functioning of the system. (Head teacher, March, 2009). This research therefore aims at coming up with a system that will keep records, and process electronically all Library documents and also giving and opportunity for the students to search for the library materials using the system.

1.3 Scope of the Study

1.3.1 Geographical Scope

The study was conducted at Kabojja Junior School, and provided information about the current system of processing Library records.

1.3.2 System Scope

This study concentrates more on Library records management systems at the school. The attempts made by different professionals towards resolving Library issues, was only succeeded in improving to some extent. The new system covers the following functionalities; the Library record to be analyzed and designed.

1.4 Purpose of the Study

Library Management System (LMS) has its major target in changing Kabojja Junior School from using the old manual system of Library to the new Automated system to obtain speed, efficiency, accuracy, cost saving and error free student and administrative' results.

1.5 Significance of the Study

The main importance of the project is to improve on the current system being used by Kabojja Junior School to a new network-based system so as to obtain a timely, efficient, accurate, cost saving and error free students and administrative' Library records.

The system will be useful to the following categories of people;

- i. Librarians, Teachers and Class teachers will in be position to produce library defaulters in time, since the system will be able to do all the computation and corrections.
- ii. Complaints from students will reduce since they will be able to receive their library statements, library defaulter lists in time and error free.
- iii. A lot of paper work will be greatly reduced since most of the activities involve a lot of typing and processing and also since the library reports will be error free.

1.6 Objectives

1.6.1 General Objective

The main objective of this study is to design an Automated Library Records Management System for Kabojja Junior School that will keep records, and process electronically all Library documents.

1.6.2 Specific objectives

1. To investigate the problems that arises from this manual record keeping.
2. To establish how the Library records are currently recorded and computed.
3. To design an Automated Library Records Management System.
4. To test the computerized Library system.

1.7 Research Questions

1. What are the existing procedures for recording and computing Library books in Kabojja Junior School?
2. What are the shortcomings of manual record keeping at Kabojja Junior School?
3. What computerized solutions can be created to solve the manual record system?
4. How does the computerized Library system function?

1.8 Conceptual Frame

This is the conceptual framework of the project. The outcome is supposed to work as the plan appears in this diagram.

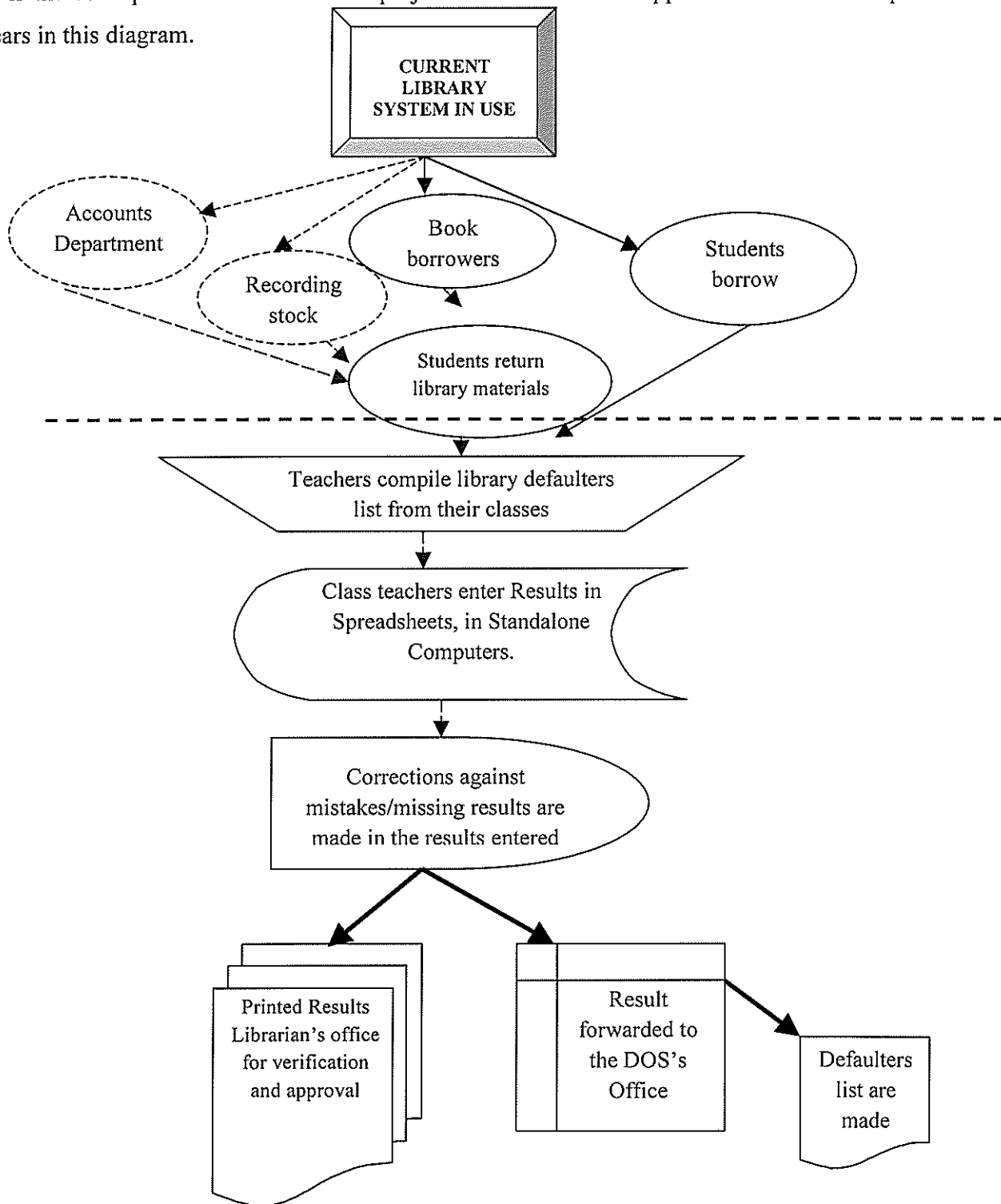


Figure1.1: Conceptual Framework for the current Library system in use

Explanation: The teachers and students borrow and return books from the library, teachers compile lists and of students with library books and then these lists are typed in excel format by the class teachers and later submitted to the librarians office for verification and approval, later these list are forwarded to the Director of Studies. . After the approval the confirmed defaulters lists are made and printed.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter examines various information available on LRMS. It also analyses the efficiency and discusses the various methods employed by professionals and non-professionals who worked towards improving the old LRMS to accommodate the need for the process. Literature survey and review sets up the margins of the research study of the system.

2.1 Library System

General education reflects learning that occurs as a result of multiple experiences and courses. Colleges have described to emphasize seven areas of general education and administer quarters utilizing stratified, random sampling of class-sections. Dissemination of information is made in different level of classes. In any single course-section, some students complete each of the six subject areas within a fifty minutes period. Assessment measures attainment of skills in quantification (mathematics). Attaining skills in communication includes three aspects. College reading scores suggest the students enter and exit at the national average. Attaining skills in analysis involves two aspects of battery. In the critical thinking portion of the assessment, freshman scored significantly higher than national norms.

Aditya (2000), stated that distance education is becoming more important in today's connected world. University and schools are supplementing traditional classroom-based learning with electronic learning management system (LMS)-software or managed learning environments, virtual learning environments, or course management system designed to deliver on-line education.

According to Cooper and Lybrand (2004), Library activities should be based on the criticality and complexity of the business functions present at the institution. The Library should begin with a review of internal and external audit activities, risk assessment to systems development. At minimum, the essential practices for system development should be clearly documented and functioning within the internal control environment. Cooper and Lybrand (2004), envisioned a rather rapid transformation of the educational delivery process and assessment of learning by the fast developing information superhighway. They indicated that institutional technology

incorporates those tools and materials that present, support and reinforce teaching. The devices used range from the pad and pencil to the computer. The use of technology in teaching started when the slate was introduced as a supplement to texts. The slate gave way to the blackboard and the chalkboard.

Antony (1993), explained the concept of a Library as a place for knowledge acquisition, or more generally a means of accessing intellectual capacity or ability. The Library determines not only the content of education but also the methods of teaching, in fact, the entire approach for education. Mathew (2005), described the new approach to Library as the functional approach that conceives the abolition of the traditional practice of declaring students as pass or fail, as well as declaring the overall results of students in terms of division. Instead it prescribes the declaration of the levels of achievements and proficiency of students in different subjects separately in terms of grades.

2.2 Advantages of a Library Management System

- a. **Speed:** Computerized Library record management system provides fast and effective way of result processing. In case a student wants Library result documents, these can just be found by entering the primary identifier and the unique key.
- b. **Cost:** Most institutions requires big store for files. These files risk being burnt by fire, human theft, being spoilt by liquid or even destroyed by pests like cockroaches. Using an electronic system, files don't need large rooms; they are stored in a small medium space.
- c. **Backup:** Copies of files can be kept by using backup system. Incase of disaster, files can easily be restored.
- d. **Printing:** Documents in electronic form can be easily printed since the required information can be sorted out and printed.
- e. **Format:** Document format can easily be altered for presentation purposes to either the senate or any responsible board of the University. Incase of mistake in recording, these can easily be corrected. It doesn't require destroying the original information.

2.4 Record Management

Therese and Beth (1997) analyzed two types of record management systems: The Intelligent Character Recognition (ICR) and Optical Mark Recognition (OMR). Both can be incorporated into an admissions application format. For instance, where data is recorded from the application and automatically inserted into the student information system database. Bar codes are another method of avoiding data entry. In this way, the University has to send to all applicants a set of bar code labels which must be attached to all documents supporting the application process. When the documents are scanned, they are automatically attached to the student's already created index. Each student is assigned a bar code and sent a page with bar code labels. This system improves on speed of record retrieval.

According to Sommerville (2001), networked systems obviously need software to run the network, and all of the major software packages, such as Novell and Apple Talk. In some single-station systems, the various components are networked together, while others there is simply an interface program in the computer. Usually, systems that run on networks also require some administrative software for the management of the files and the security of the documents (Roberto et al. 2004). Network issues are usually complex and require the advice and Library of someone from the computer services area. Where as all software systems perform the same basic tasks. Some system has software that can scan and convert microfilm directly from the film to optical disks. Other system might offer sophisticated peripheral software for forms processing, database integration, workflow applications, or free-form text search.

In library information systems, generally the librarian has the primary responsibility to maintain the integrity of the Library records and to safeguard them in accordance with institution, system, state, and regulations (Newton, 2007). When making this determination, an institution should consider which office has responsibility for the administrative function that has the best understanding of the meaning and status of the data. Also this should be the most knowledgeable about the data use, the regulations that apply to it, and their interrelationships with other databases or information management systems.

Therese and Berth (1997) pointed out that authorizing access, educating users, determining standards of security, and ensuring compliance with local, state and guidelines relating to the data will be most effective if ownership and responsibility for authorizing access to the information reside with office that has the greatest interest in both using and protecting the data.

Today's Information Technology (IT) explosion, the necessity for computerized operational system, the expansion of data systems and databases as well as the need to manage those data and make them accessible in a meaningful form, require coherent institutional policy on information management (Kelly, 2004).

Organizing and managing student records into a cohesive and efficient system might seem like an impossible task. This partly is due the existence of wide array of the existing information yet the institutions are often limited with personnel and finances. To address this challenge schools need to weigh features and requirements of the software that will meet their own unique needs, desires and capabilities (Veccholi, 1999).

Hawkins (2007), recommended on the radical change of our concepts, principles, and implementation so as to keep pace with the dynamic evolution of information security. A policy should be in place that will include the assignment of responsibility for the implementation of database management, designation of the offices or functional areas responsible for data. Also in place should be the acceptable standards of security, reference legal guidelines affecting the information, and procedures for dealing with instances of security violation. The policy must be approved and supported at all administrative levels. It must be flexible enough to allow the hardware, software, and function changes but rigid enough to ensure the security and confidentiality. These policies need to be reviewed and updated. Operational information systems need to be reviewed, and policy on appropriate levels of access established or re-established. The review should be followed by documentation that lists and describes both the education records covered under the Family Education Rights and Private Act (FERPA) and other categories of records. In order to identify responsibility for data ownership, a data management policy has to be laid down to ensure data and information technology security management. The data managers, computer center personnel, and the security manager jointly have to establish minimum acceptable security standards.

Weiss (1993) recommended the establishment of a formal process for authorizing access to information. This process should clearly identify the parties responsible for authorizing access, specify the criteria for determining access, and delineate the authorization procedures used to obtain access. Both the personnel involved and the security itself need to recognize and enforce the institutional policy through this process. Formalizing these responsibilities will protect the

integrity, availability, confidentiality and privacy of information resources. Approval and sign-off by the manager(s) of the data must be incorporated into the process for granting access. However, in order to have the appropriate checks and balances, the process should be separated between the managers responsible for the data and the security (Nikto and Susan, 2006). Developing procedures along these principles put the data manager in charge of authorizing and controlling the access, while the security manager is in charge of enforcing and maintaining the security system. Both areas share responsibilities for educating the users.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

In this chapter, case study method and statistical method were used to derive on the results and implementation of this study. Also the chapter shows: - area of study, user coverage, research design, data collection methods and instruments, data analysis, system requirements and specification, system design, system security, system testing, as well as limitations of the study.

3.1 Area of Study and Population

The study was about Kabojja Junior School's Library records management system. Kabojja Junior School has population of 40 teaching staff and 8 non-teaching staff. The institution was chosen as a case study and the study focused on providing all the necessary information about the old records management system that drove the project towards the development of the new system.

3.2 Sample Statistics

Questionnaires were administered to Principal, Head teacher, Director of Studies, Class teachers (9), and selected teachers (10) users. Also, interviews were conducted to the same respondents who answered the questionnaires.

3.3 Research Design

It was planned as to: what was to be observed where, why, how to record observations, how to analyze/interpret observations, and how to generalize. Research design was thus a detailed plan of how the goals of research were to be achieved.

The study was done in to two major phases. Phase 1 covered the needs assessment study to the expected users of the proposed new Library system –KJSLRMS. These included the Principal, Director of Studies (DOS), Head teacher, and class teachers (6). The main objective of this phase was to determine the necessary for the system and the requirements for its development.

The second phase which forms a big part of this study embarked on designing the computerized KJSLRMS. The system was built on the MS-ACCESS based network environment where

computers running on the school's Local Area Network (LAN) were used in the study to cover the Library records capability.

3.3.1 Needs Assessment of the expected users of KJSLRMS

Sample selection method was done. Stratified random sampling techniques whereby Kabojja Junior School was picked and the system used there was examined. On the part of staff and administrators, purposive method basing on their roles and experience in service was used. Some of them were those in-charge of the Library board.

3.3.2 Data Collection Methods and Instruments

Interviews, questionnaires and library and Internet search were used for data collection while the main theme of the questionnaire was centered on the development of an automated Library records management system for Kabojja Junior School. Questionnaires were constructed in a systematic manner. The process went through a number of interrelated steps. The most commonly steps were (Sarantakos, 1998):

Preparation; Thought of various items to be covered in the questionnaire, arranged the items in relation to one another. Constructing the first draft; this involved formulating of a number of questions including direct/indirect, closed/open-ended and primary/secondary/tertiary questions. Revisions; after receiving suggestions, some questions were eliminated, some changed and some new questions added. Revision (Second); the minor and major changes were made on the basis of experience gained in pre-testing. Preparing final draft; after editing, checking spelling, space for response, pre-coding, and the final draft was prepared. This was then distributed to the key users of the system.

3.3.3 Data collection instruments

These involved the questionnaires, interviews and Library and internet search methods.

3.3.4 Interviews and Questionnaires

A semi-structured questionnaire was administered to users (Principal, DOS, Head teacher, Librarian (1), Class teachers (9) and selected teachers (10)). It addressed the theme; challenges of speeding up Library records and result processing, cost saving and data security & integrity. Twenty-six questionnaires were distributed to the users but only twenty-two were returned. Interviews were conducted to individuals using the interview guide.

3.3.5 Library and Internet Search

Library and Internet search was used to find documented evidence on the previous attempts made towards improving the Library processing both Kabojja Junior School, and other learning institutions at all levels. At this stage, primary and secondary data was used. A number of relevant textbooks, journals, periodicals and newspapers were used.

3.4 KJSLRMS Network Connectivity Coverage

This project was built on MS ACCESS based network environment where computers running on a local area network (LAN) were used for the project to cover the Library records capability. This catered for all the users at the School at all levels. The role of the server was to host the database for record keeping, while client computers were terminals for Library records entry, modification and retrieval. These client PCs were positioned in various offices that could access the network for ease of record processing.

3.5 KJSLRMS Development Process

The development process of a system was traditionally as a Waterfall Model where each step followed the next, as if in a waterfall. This showed how various products produced at each step were used in the process. It did not imply that any of the steps in a process had to be completed, before the next step starts, or that prior steps will not have to be revisited later in the development. It was a useful model for seeing how each step worked with each other. Due to its cascade from one phase to another, this model was appropriate to use on this study because its principal stages of the model mapped onto fundamental development activities. The activities involved include;

Requirements analysis and definition; the system's services, constraints and goals were established by consultation with system users. System and software design; the systems design process partitioned the requirements into either hardware or software systems. It established overall system architecture. Software design involved in identifying and describing the fundamental software system abstractions and their relationships.

Integration and system testing: At this stage, the individual program units or programs were integrated and tested as a complete system to ensure that the software requirements have been met. After testing, the software is delivered to the user and finally, Operation and maintenance.

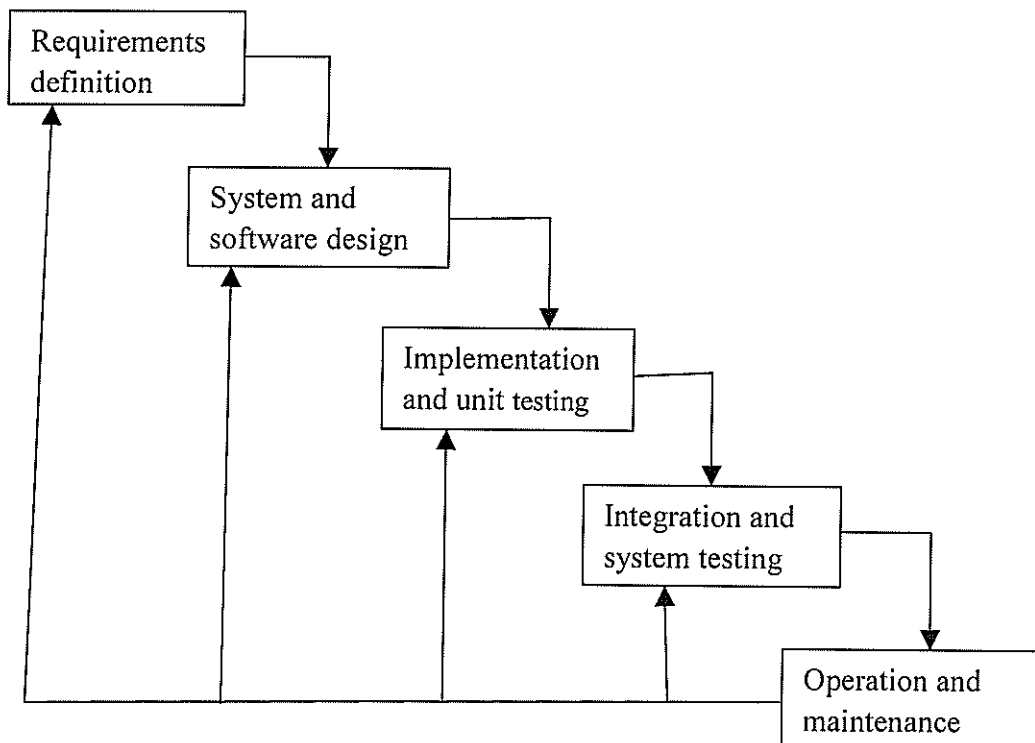
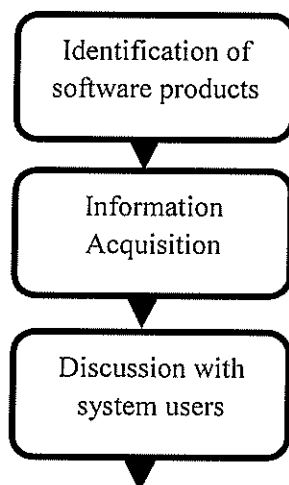


Figure 3.1 The waterfall model of the system development process.

Source: Sommerville, I., (2001), 6th ed. pg19

3.7 KJSLRMS Design

The design considered how the system will ultimately serve the unique and general institutional needs. A set of criteria was drafted in order to compare and evaluate each system. According to Wright (1990), he suggested a “staged approach” to evaluation whereby “systems are evaluated against progressively in more detailed criteria”. The first stage of evaluation was characterized by the performance of certain tasks:



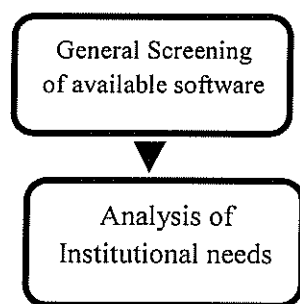


Figure 3.2 The First stage of evaluation of the **KJSLRMS** System Design

Source: *Wright, P. (1990).pg321*

Moreover, the system was designed to consider the following; data security and integrity, user authentication, user access rights, usability- user interfaces, robustness.

It works in the following procedure; user login is authenticated by the use of case-sensitive username and password. Depending on the access level, the user is then granted access to the program and the desired data on a remote server. It provides the following controls for both data editing, new entry and updates for records pertaining the Students details, subjects done with their related tests and final Library scores. The administrators and users of the system are also part of the records in the remote server that are accessible. Users are monitored by the administrator and can be logged out if access violation is suspected.

3.8 KJSLRMS System Testing

3.8.1 Testing

testing of the system involved cross checking of all the forms, queries, modules and tables to ensure that they equally respond to all the data that has been entered so that the requirements of the system are put to reality. And in this we used the V- shaped testing model

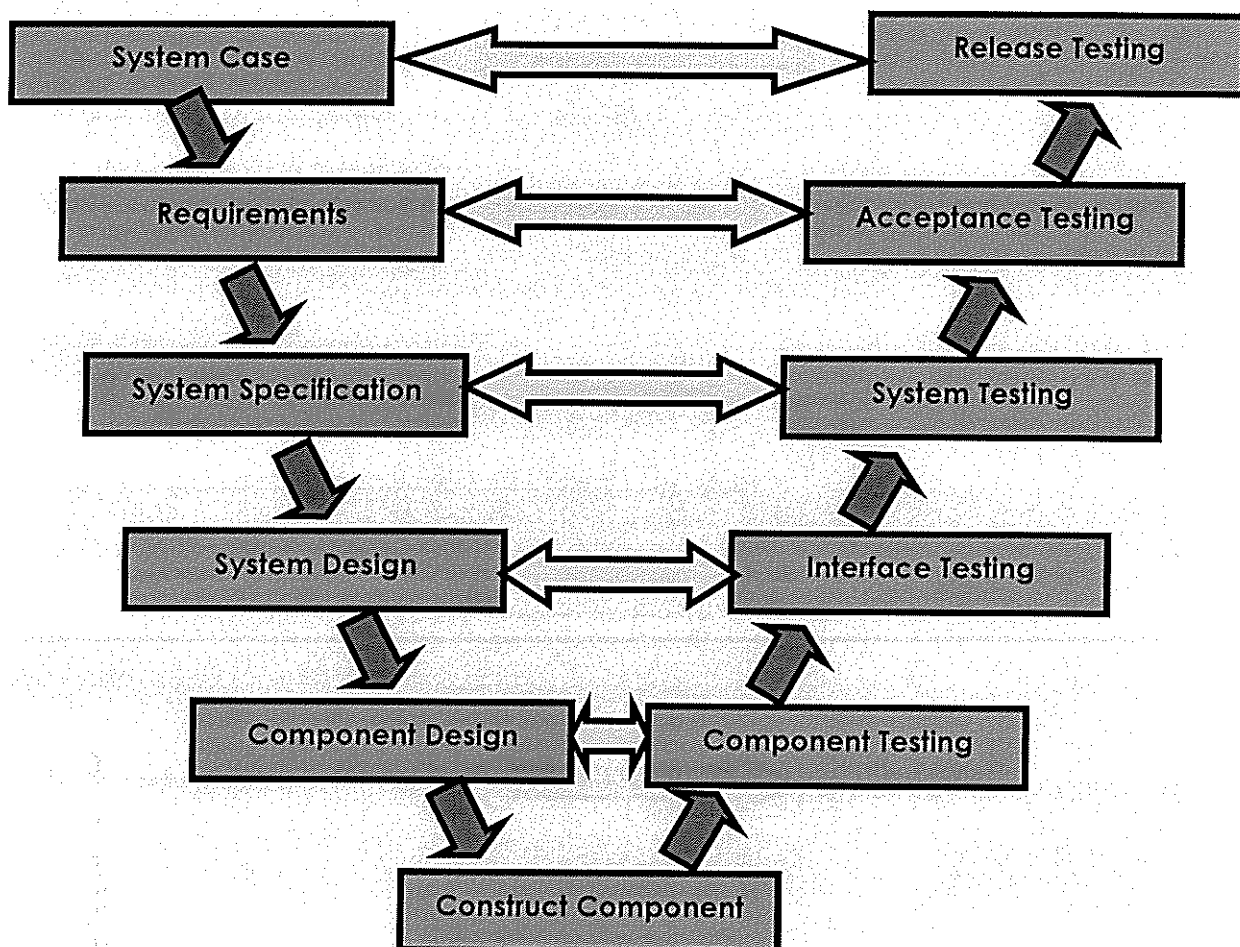


Figure 3.3 Sample display of the conventional “V-Model” highlighting the system testing stages of Kabojja Junior School Library Records Management System

Source: <http://en.wikipedia.org/wiki/V-Model> (Software development)

3.8.1.1 Component Testing

Component Testing involved checking that each feature specified in the Component Design was implemented in the component. The database called “KJSLRMS” was created using Microsoft ACCESS which contained the following tables; users table, Queries, log account table, accounts table (Library users registration), stockkabojja table, subjects and categorycodes results table, Ledger results table. Data was later entered in the tables and queried to test on its functionality, no error was displayed.

3.8.1.2 System Testing:

The entire system was built; it was tested against the System Specification to check if it delivered the features required. The system specification tested were; Computer processor, Memory, Display, Operating System, Office and Network Card, the component's details were checked under control panel. System testing was not about checking the individual parts of the design, but was about checking the system as a whole.

3.8.1.3 Acceptance Testing:

Acceptance testing checked the system against the requirements. Acceptance testing checked that the system delivered what was requested. The users were the one who did the acceptance testing. The users (Principal, Librarian, Head teacher, DOS, class teachers and selected teachers) knew what was required from the system (KJSLRMS). Some of the users were trained on how to use the system.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.0 Introduction

Data collection for the needs assessment study was conducted through the use of questionnaires and interviews to the targeted users of the System. These users included the Librarian, Principal, Head teacher, DOS, Class teachers, and selected teachers. Various questions relevant and related to the topic of research were asked to the respondents. The results obtained after the analysis were the basis of the development of KJSLRMS.

4.1 Perception of the targeted users on the introduction of the KJSLRMS

4.1.1 Feasibility and Benefits of KJSLRMS

The targeted users (mainly KJS administrators) were asked if they felt any foreseen benefits in the introduction of the proposed new automated Library record management system now referred to as KJSLRMS. Also if they would consider KJSLRMS as a tool that would be effective and feasible to the School. Results obtained showed that about 77% (Table 1) were excited and in agreement with implementation of the proposed project. Some (18%) were not sure due to the existing limitations such as poor Internet connectivity, power supply and computer facilities which could hinder the effectiveness of the system. Results obtained from provided the base the study to be initiated.

Table 1. Users' perception on the feasibility of the proposed Kabojja Junior School Library Records Management System

Response by users	No. of respondents	Percent of the expected users	Valid Percent	Cumulative Percent
Yes	17	77.3	77.3	77.3
Somehow	4	18.2	18.2	18.2
No	1	4.5	4.5	4.5
Total	22	100.0	100.0	

4.1.2 The office to be given priority for implementation of the project

The project involved the development of the system that had to go through stages. One of them is a system prototype. Prototyping was to be done in one of the offices during the development. Majority of the respondents (72.7%) proposed the Librarians office to host the prototyping and piloting of the new system. However, this has to be developed with the provision for all other offices in the school to develop the same in future.

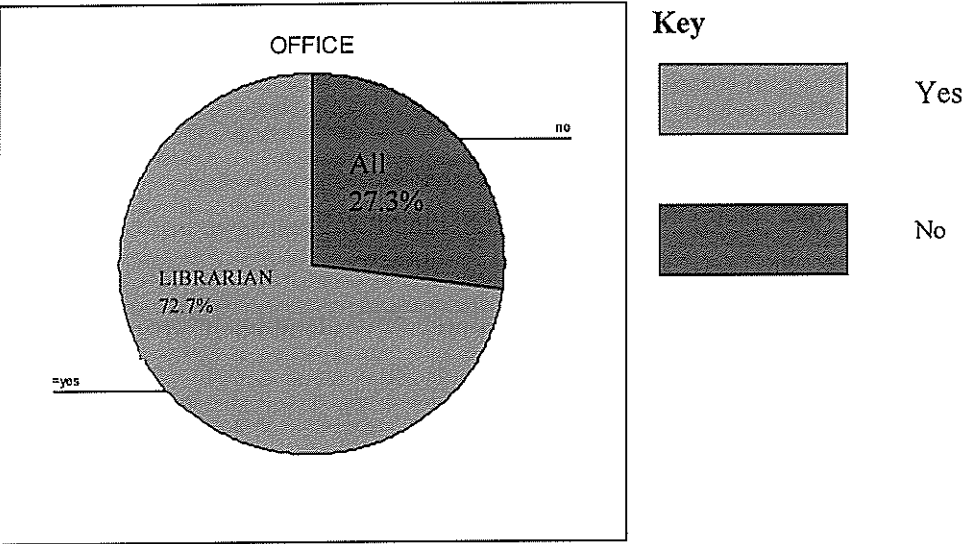


Figure 4.1 Users perception on the pilot office for the development of the Tropical High School Examination Records Management System

4.1.3 Crucial stage (s) of Library to be consider for automation/implementation

The Library system consists of various sections for computerization among which are; students’ registration details, Authors details, classification table, subjects table, payments table, establishment of records management database, production of administrative library reports. The respondents were asked to recommend which of these stages are vital for the implementation in this project.

4.1.3.1 Computerization of students' registration

The students' registration details would involve all the details that are required by the school about a particular student, excluding the Library results. These details are always taken at the time of student's admission to the school. The responses from the respondents revealed that students' registration should be implemented in the automation process.

4.1.3.2 Computerization of the Subjects records storage

Subjects records storage would involve details about a particular subject including the code, name, defaulters in that subject etc. The respondents felt strongly that the electronic subject records storage should be implemented as part of the proposed KJSLRMS.

4.1.3.6 Computerization of the school defaulters clearance verification process

Students are supposed to sit for their Library after the school has confirmed their fees clearance status; Cleared students only are allowed to use the Library. The respondents were asked if clearance of library defaulters should be included in the KJSLRMS. Almost 82 % (Table 3) of the total respondents felt that this was important so as to allow the list of library defaulters to be produced on time before the term and exams commence. It would also assist the school to have the reliable records of the fees.

4.1.3.10 Database establishment of the Library results

To keep track of all the Library records, there needed a database to be established, located on a secure server in the school. This database would hold records to be accessed remotely by terminal computers networked with the server hosting the data. The respondents were asked whether this would be an important part of the system required for implementation and 81.8% were in full support for this component to be included. With the database in place students can be provided by the school with any type of information on time.

4.1.3.11 Computerizing the production of the students' defaulters lists

One of the stages in the development of the system is to implement academic Report cards production. The respondents were to indicate whether this was required for the implementation as part of the system. Results obtained showed that 95.5 % of the respondents (table 7) were in agreement so as to shorten the period by which students were able to access their report cards after the term's Library. Under the current system, report cards production of a certain class can take as long as a month. This is because of the large number of students.

Table 2. Users' perception on the proposal to computerize the production of the students' Library defaulters list under the Kabojja Junior School Library Records Management System

Response by users	Frequency	Percent	Valid Percent	Cumulative Percent
No	1	4.5	4.5	4.5
Yes	21	95.5	95.5	100.0
Total	22	100.0	100.0	

4.1.4 Proposed users to access KJSLRMS

The system should be restricted from the unauthorized users for security purposes. This is to protect the access of the Library records from wrong hands. In the proposed system, respondents were asked to list down the potential category of the users whom they considered compulsory to access the system. Depending on the level of involvement in the whole system, the network administrator could then assign some restricted access to every individual. A certain category would be allowed to access the whole system while others just some parts which are relevant to his/ her own tasks. Listed were: Librarian, the Principal, Head teacher, DOS, class teachers and the Administrative assistants. The former three categories could also be allowed to access the whole system.

4.1.5 Proposed office to host KJSLRMS

The system server is to be hosted in a secure place since it is to hold the database and to provide security to the Library records. An office, appropriate for the server to be based was to be proposed by the respondents.

The responses from the respondents in table 8 (72.7%) clearly indicated that the server should be hosted at the Librarian's office. This was supported by the fact that, this office has the skilled personnel in Library records management and Library results processing. It is also the one in charge of students' Library results production, students' affairs and is where most Library matters are handled.

Table 3. Users' perception on the proposal to computerize the office to host the server under the Kabojja Junior School Library Records Management System

Response by users	Frequency	Percent	Valid Percent	Cumulative Percent
No	6	27.3	27.3	27.3
Yes	16	72.7	72.7	100.0
Total	22	100.0	100.0	

4.2 Study limitations

All aspects of the problem cannot be observed simultaneously. For instance, internal attitudes and opinions were not easily studied. In the needs assessment it was noted that there was a bias in response selectivity because some respondents had no interest in the topic and did not give response to all questions. Likewise some information from the interviewees tended to hide information or gave wrong answers because of fear of identity. For the sensitive questions, they were less effective i.e. failure to answer the question properly. Variability in responses from the interviewees was also experienced leading to inconsistent responses.

A software development project is one that involved a lot of time investment. The period given for this study was one of the limiting factors towards the attainment of the final expected outcome of the product.

CHAPTER FIVE

SYSTEM ANALYSIS, DESIGN AND IMPLEMENTATION

5.0 KJSLRMS Database Design Structures

The database structure is the core of the KJSLRMS design. It contains of the fundamental objects that make up the raw material upon which concept maps are built, i.e. the concepts and relations, as well as concepts maps themselves, KJSLRMS also contains the ideas for how to identify and allocate these ideas.

The structure includes the layout of the database as used in the KJSLRMS program, with the related fields, properties and the relationship with the data integrity.

5.1 KJSLRMS Analysis

5.1.1 Description of the current system

At present, the system for managing the Library records is fragile whereby all the Library information is recorded and stored as excel spreadsheet. The Library records can however be exchanged between the relevant offices such as the office of the DOS and/or Principal using unreliable media such as floppy diskette or a memory stick.

With the present procedure above, it is obvious that the security of the Library records could also be compromised in one way or another without prior knowledge of the higher offices. Also these storage devices are un-trusted for safety and reliability since they can easily corrupt data or run faulty with the vital results stored in them. The records can also fall in the hands of the unauthorized people. Lacking of central database management system at the school hinders its growth in the sense that the librarian cannot update the student's records at a required time.

5.1.2 Weakness of the current system

- i) Since the system is not computerized, student's information is stored in different locations. It is difficult to have all files updated. This leads to data inconsistency.
- ii) Delay in getting information concerning performance (student library status i.e. how often a particular student visits the library) or other related details. This is as a result of amount of information taken down for all students and teachers.
- iii) Poor data security; with information scattered, it is difficult to secure all of it. Some of it is easily accessible by unauthorized users. In the event of an accident, the information stored in manual files are more difficult to salvage creation of backup data in hand.
- iv) Less economy of space; almost, every term new students register at the school. That implies, new files are added to the shelves. At the time this research was carried out, about 40 percent of the Head teacher, and DOS offices were occupied by files containing student's records.

5.1.3 Possible solutions to the problems

- i) Training the employees on ways of effective record keeping. This would help in increasing the efficiency by overcoming some of the problems mentioned above.
- ii) Developing an Automated Library Records Management System. This would involve identifying the problem, analyzing the findings and designing a system that will specifically solve the identified problems.

5.1.4 Description of the system

The system developed presented a user-friendly interface. Use of uniform coloring, and button arrangement supported the ease of use of the system. There are few but multifunctional command buttons that the user couldn't get mixed up with. The program is incorporated with system status indicator inform of light that shows the user the status of the system; either active or inactive. There is ease in configuring the system. The administrator simply installs the system and enters the network configuration with relation to server part of the system.

5.2.3 Students Registration Data Table

The design of the students' registration table (Figure 5.4) is as described here. It consisted of the following fields;

- Account (Primary key, text, 50, Not Null,);
- Name (text, 50, Null);
- class (text, 50, Null);
- Sex (text, 50, Null);
- date completed (date/time, Null);
- stream (text, 50, Null);
- Autofiled (autonumber, 10, Null);
- type (text, 50, Null);

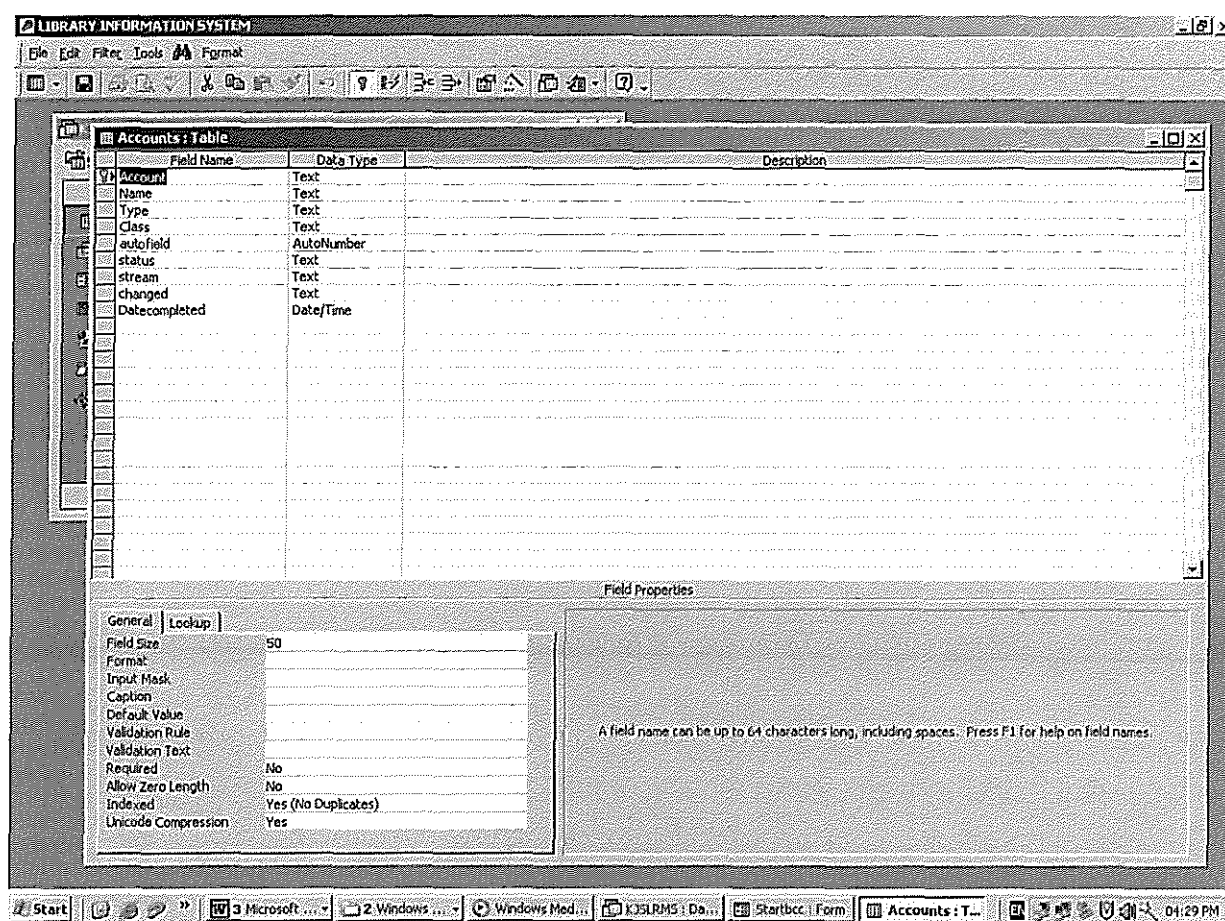


Figure 5.4 Sample display of “Database table design- accounts” of the Kabojja Junior School Library Records Management System

The design of subjects done table (5.5) consists of the following fields;

- Subject (Primary key, text, 50, Not Null),
- Subject code(text, 50, Null),
- Order(Text,10, Null)

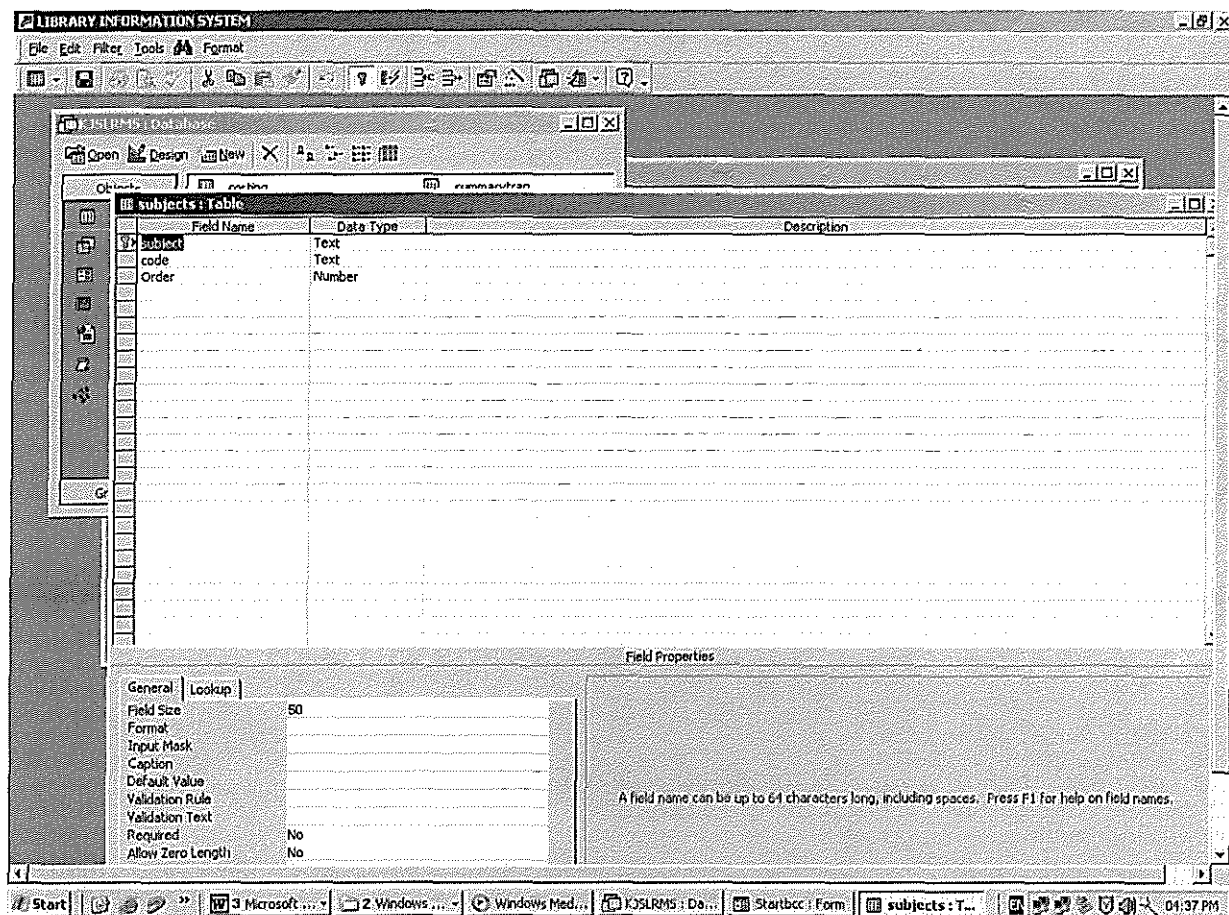


Figure 5.5 Sample displays of a “Database table design-Subjects done” of the Kabojja Junior School Library Records Management System

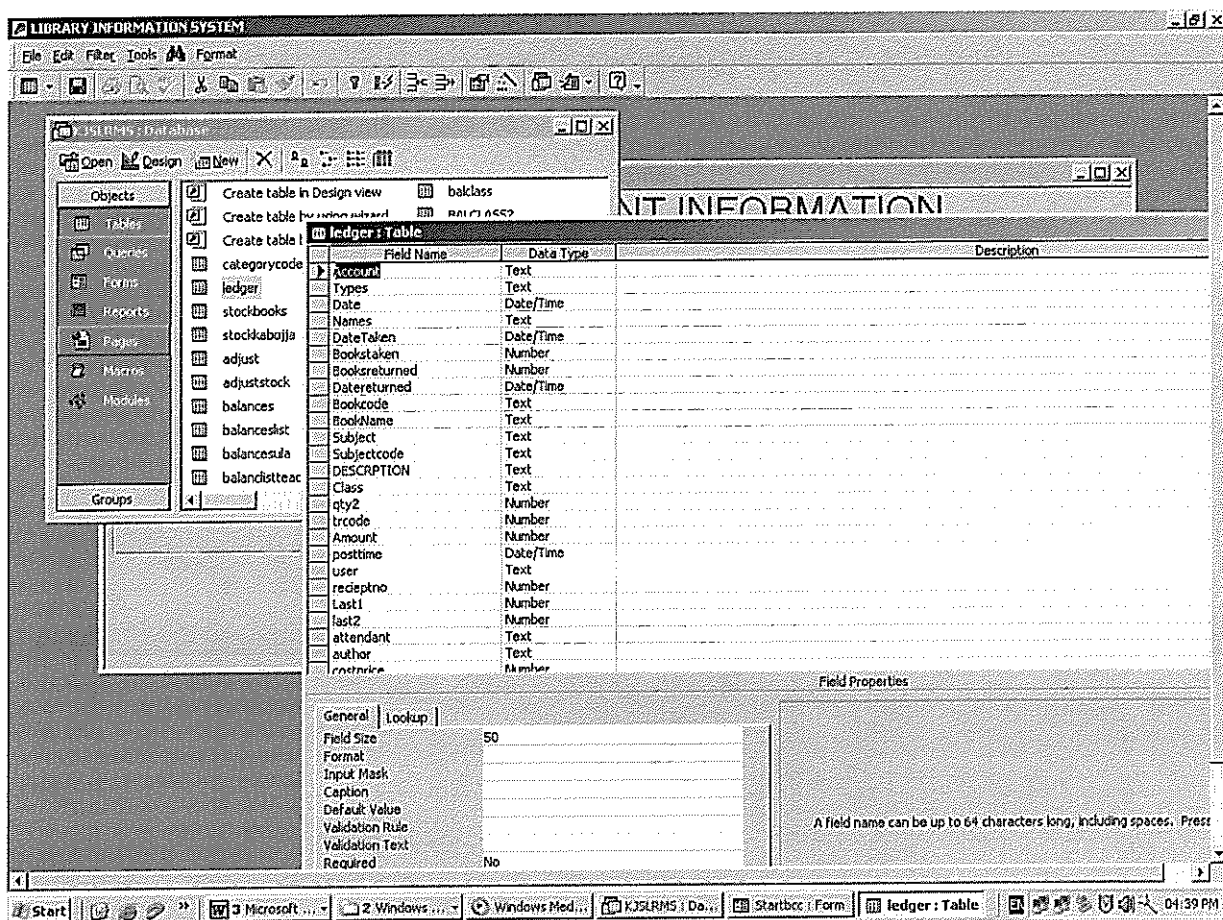
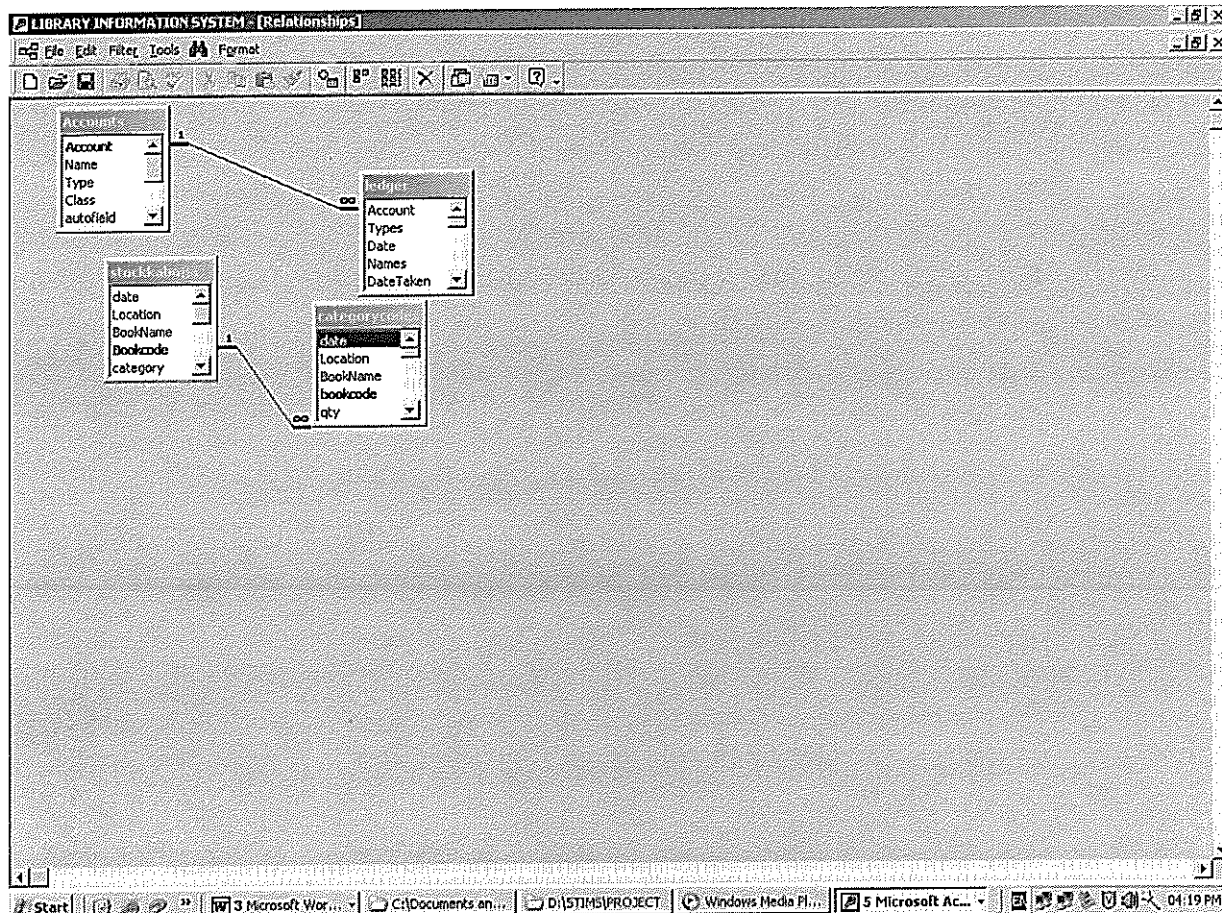


Figure 5.7 Sample display of a “Database table design- Students Results” of the Kabojja Junior School Library Records Management System

5.3 Table Relationship Design



The various data tables are related to one another as shown in Figure 5.8

Figure 5.8 Sample display of a “Database design table relationship” of the Kabojja Junior School Library Records Management System.

5.4 KJSLRMS Interface

5.4.1 Interface

The system interface provides the basic functions to start and stop the application and to get information on the number of processes and the on process identifier. It also provides a function to poll the system layer for a synchronous event. The function is architecture dependant. The system interface includes the screenshots taken from the System Software. These interface shows sequentially from welcome window through login, main window, up to exit.

5.4.2 Logging in the System

The login screen is loaded immediately after the welcome window. It is the security section that crosschecks the user access to the system. Users are required to enter the username and password as part of the access security measure. On clicking OK, the user is prompted to the system. But if the user enters wrong password, the system displays a message “Sorry Invalid Password”

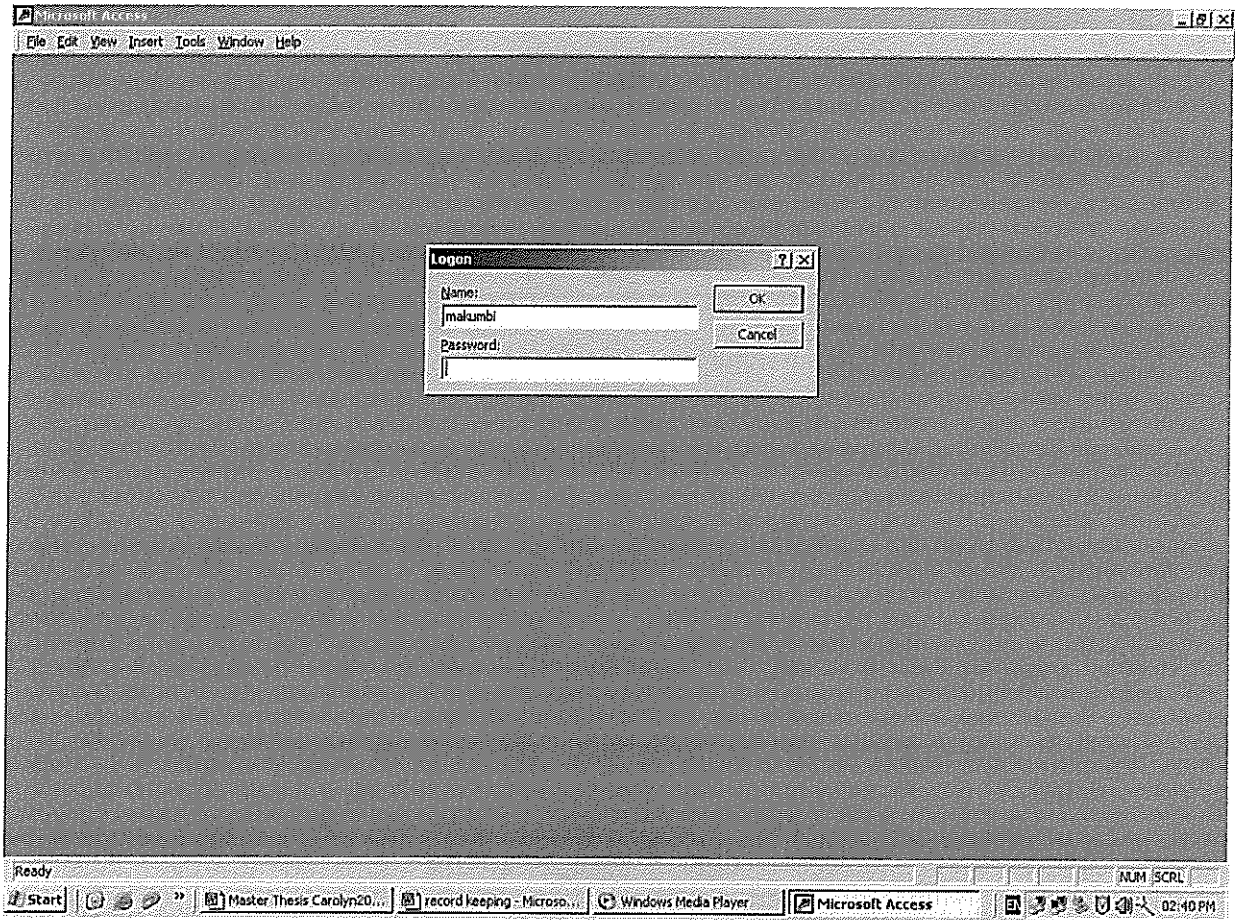


Figure 5.9 Sample of the dialog box of “Login Screen” of the Kabojja Junior School Library Records Management System

5.4.3 The main Screen

The main screen displays the features of the program to aid users' accessibility of the system. It provides both controls and access to other forms and grids for data mining activities (Figure 5.10).

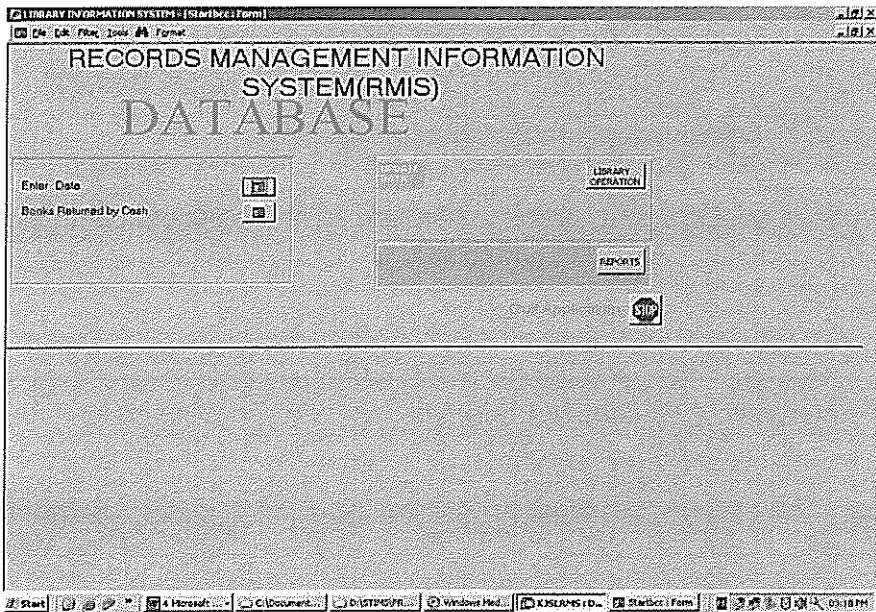


Figure 5.10 KJSLRMS Main screen

5.4.4 User Details

After the login is successfully verified, the user is presented with an appropriate screen depending on the level of access. In this case, a default screen for an administrator is the users details display screen in form view format. (Figure 5.11).

Sample user data entry forms

Below is the interface used in dispensing book and other library records

Figure 5.11 A sample of view form of “Users details display screen” of the Kabojja Junior School Library Records Management System.

5.4.5 Students’ Registration

Figure 5.12 shows a student registration details in a form format. The view shows the details of all the registered students’ details as entered by the administrator. The list is automatically arranged using the Student in the ascending order, updating and adding new entry can be done on the Add New form.

Figure 5.12 A sample of the dialog box of “Students registration details- Form view” of the Kabojja Junior School Library Records Management System.

5.4.6 Subject available in the library

All the subjects are listed here with information such as Subject Code, Subject Name, and the user can edit, add new, retrieve, navigate, delete and update data. Saving is automatic can also be. The records can also be viewed one at a time by clicking on the ‘option button’ tab. The user can Edit, Add New, retrieve, Navigate, delete and Update data.

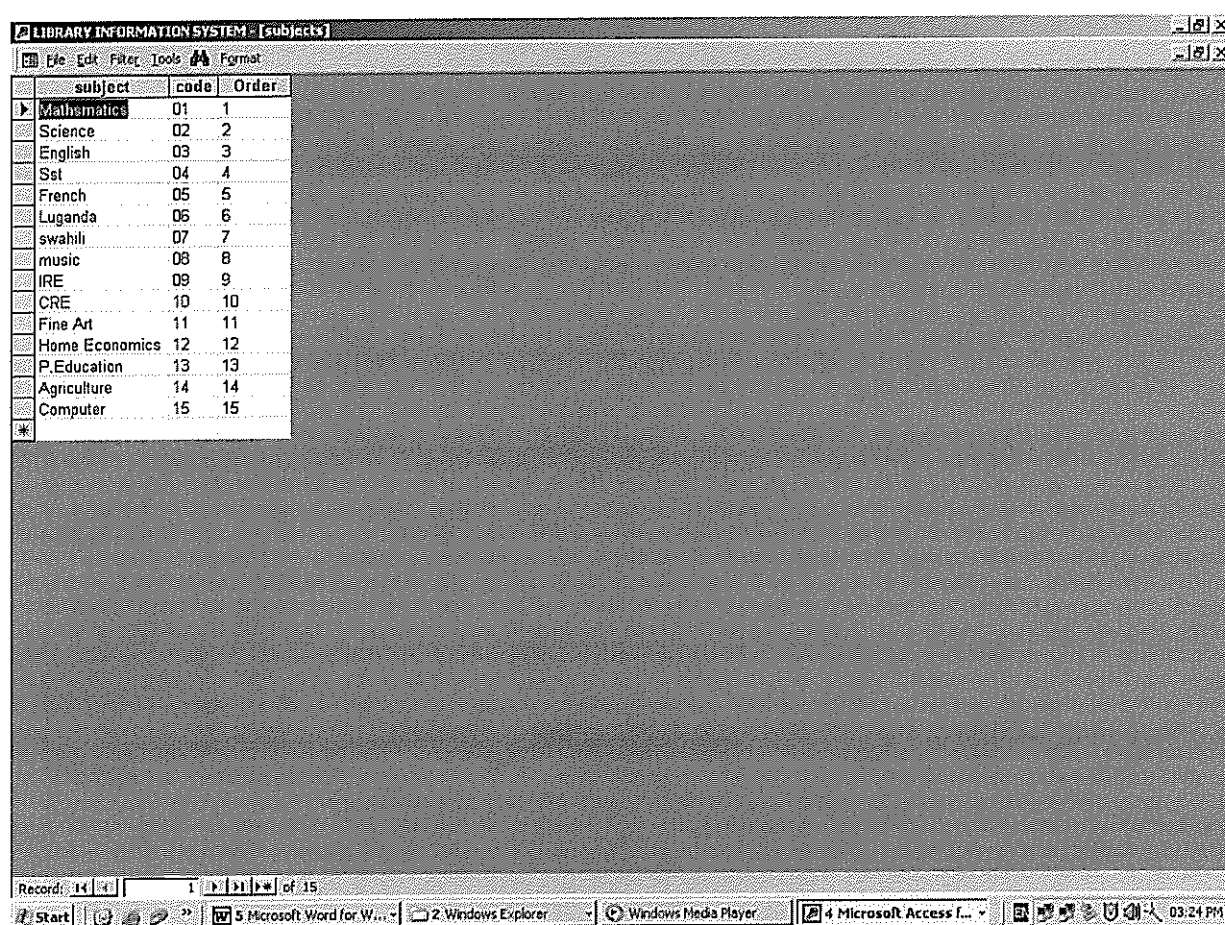


Figure 5.13 A sample of the dialog box of “Subject Done details- datasheet view” of the Kabojja Junior School Library Records Management System.

5.4.7 Fees Payment from library defaulters

Figure 5.14 shows a fees payment details in a form format. The form shows the details of the for recording payments from the library defaulters Note if a student has been confirmed to have lost say a book that she or he borrowed.

LIBRARY INFORMATION SYSTEM - [Cash]

File Edit Filter Tools Format

Client Account: [] Class: []
Name: [] Stream: []
Description: [] Date: 24/06/2009
Librarian: []

Total: [] Advanced Search

Category	receiptno	Amount	markreturn	DateReturned	Books

Record: 14 of 1

Start 5 Microsoft... 2 Windows... Windows Med... KJSLRMS: Da... Startboc: Form Cash 03:32 PM

Figure 5.14 A sample of the dialog box of “Students Fees Payment- Form view” of the Kabojja Junior School Library Records Management System.

5.4.8 Reporting System

The reporting system is automatically generated on daily basis from the records entered. Some of reports that are automatically generated include the following, stock movement report, automatic generation library defaulters list, Automated and simplified book recordings using intelligent screens, Automatic generation of library reminder notes to clients (students), Automatic data checking before posting, Automatic reminder to the librarian about the overstay of some books with the borrowers.

LIBRARY INFORMATION SYSTEM - [Statements: Form]

File Edit Filter Tools Format

Library statement
Daily library Reports
Library Reminder Notes(Students)
Stock comparison reports
Bookstatement
General balance list
book bank report
snapshot
subject categorised
Subject summary
Books Archived summary
Teachers balancelist
Monitor book by serial number

Balance Per Class [] []
Ok

Select Class [] []

From 24/06/2009
To 25/06/2009

☐ Cash collection
☐ Class Borrowed
☐ Never borrowed week,month,term

Record: 1 of 1

Start 6 Microsoft Word for W... 3 Windows Explorer Windows Media Player 4 Microsoft Access f... 03:41 PM

Figure 5.15 A sample of the dialog box of “Reporting in form view” of the Kabojja Junior School Library Records Management System.

The screenshot displays a software window titled "LIBRARY INFORMATION SYSTEM - [BALANCES]". Inside, the school's name "KABOJJA JUNIOR SCHOOL" is centered at the top, followed by its address "P.O. Box 27199", telephone number "Tel: 256 - 41 - 340069 Kampala.", and email "E-mail: kabojja@infocom.co.ug". Below this, the report is titled "BOOKS MOVEMENT REPORT AS OF 24 June 2009" and is noted as "(SORTED ON ACCOUNT NO.)". A table follows with four columns: "BOOKCODE", "BOOK NAME", "TOTAL OUT", and "INSTOCK". The table contains one data row for bookcode "1 001" titled "Introduction to computer application", showing "1" total out and "5" instock. A "TOTALS" row at the bottom shows a total of "1" for the bookcode and "5" for instock. The window's taskbar at the bottom shows various open applications including Microsoft Word, Windows Explorer, Windows Media Player, and Microsoft Access, along with the system clock showing 03:43 PM.

BOOKCODE	BOOK NAME	TOTAL OUT	INSTOCK
1 001	Introduction to computer application	1	5
TOTALS	1	1	5

Figure 5.16 A sample of the stock comparison report” of the Kabojja Junior School Library Records Management System.

5.4.9 Teachers Library Results

Since teacher’s borrowing will also be catered for by the system below is a sample report generated from the system indicating teachers with schoolbooks

(WELCOME TO MY LIBRARIAN) A LIBRARY INFORMATION SYSTEM 3.0 [balandisteachers]

Connection... Restore... Backup... Undo Columns... Tools Edit

KABOJJA JUNIOR SCHOOL
P.O. Box 27199
Tel: 256 - 41 - 340069 Kampala.
E-mail: kabojja@infocom.co.ug

Balance list teachers as of
24 June 2009

Name	Account	Accession	balance
ACHIAM JEHIFER	06-00714		
STORIES OF NATURE		0238-0005	1
ESSENTIAL ENGLISH WORKBK		0941-0001	1
			2
AISU	06-01012		
BRIGHTER GRAMMER		0078-0007	1
THE NEW FIRST AID IN ENGLISH		0121-0001	1
JUNIOR ENGLISH COMPOSITION & GRAMMER		0009-0008	1
ESSENTIAL ENGLISH WORKBK		0943-0001	1
BRIGHTER GRAMMER		0077-0004	1
UGANDA PR. ENGLISH COURSE		0014-0006	1
OXFORD PR. ENGLISH		0029-0022	1
MK. PRIMARY ENGLISH		0052-0004	1
			8
AKIA CHRISTINE TEDDY	06-00604		

Page: 14 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 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1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1222 1223 1224 1225 1226 1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1260 1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280 1281 1282 1283 1284 1285 1286 1287 1288 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298 1299 1300 1301 1302 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313 1314 1315 1316 1317 1318 1319 1320 1321 1322 1323 1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352 1353 1354 1355 1356 1357 1358 1359 1360 1361 1362 1363 1364 1365 1366 1367 1368 1369 1370 1371 1372 1373 1374 1375 1376 1377 1378 1379 1380 1381 1382 1383 1384 1385 1386 1387 1388 1389 1390 1391 1392 1393 1394 1395 1396 1397 1398 1399 1400 1401 1402 1403 1404 1405 1406 1407 1408 1409 1410 1411 1412 1413 1414 1415 1416 1417 1418 1419 1420 1421 1422 1423 1424 1425 1426 1427 1428 1429 1430 1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469 1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482 1483 1484 1485 1486 1487 1488 1489 1490 1491 1492 1493 1494 1495 1496 1497 1498 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1560 1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573 1574 1575 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586 1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612 1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696 1697 1698 1699 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1766 1767 1768 1769 1770 1771 1772 1773 1774 1775 1776 1777 1778 1779 1780 1781 1782 1783 1784 1785 1786 1787 1788 1789 1790 1791 1792 1793 1794 1795 1796 1797 1798 1799 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1867 1868 1869 1870 1871 1872 1873 1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 25

5.5.2 Requirements

5.5.2.1 Minimum requirements

The systems require a virtual explorer client, which has two major components (client and server machines) of which the minimum and recommended specifications are detailed as follows:

Minimum System Specification of the Client Machine:

Pentium	I11 and above				
Memory:	128 MB System RAM				
Display	16MB	VRAM	OpenGL	Graphics	Card
	15"Monitor, Minimum resolution 1027x768 32bit Colors				
Operating System	Microsoft Windows 2000 Professional				
Office:	Office XP Professional				
Network:	1 Network Card (RJ 45 standard)				

Minimum System Specification of the Server Machine

Pentium	IV and above				
Memory:	512 MB System RAM				
Display:	16MB	VRAM	OpenGL	Graphics	Card
	15"Monitor, Minimum resolution 800x600 32bit Colors				
Operating System:	Microsoft Windows 2000 Server				
Office:	Office 2000 Professional				
Network:	2 Network Card (RJ 45 standard)				

5.5.2.2 Recommended Requirements

Recommended system specifications of the client machine

Computer/Processor :	PIII 800 MHz				
Memory:	256 MB System RAM				
Display	16MB	VRAM	OpenGL	Graphics	Card
	17"Monitor, Minimum resolution 1024x768 32bit Colors				
Operating System	Microsoft Windows XP Professional				

Office: Office 2000 Professional
Network: 1 Network Card (RJ 45 standard)

Recommended System Specifications of the Server Machine:

Computer/Processor: PIV 2.4 GHz
Memory: 512 MB System RAM
Display: 16MB VRAM OpenGL Graphics Card
19"Monitor, Minimum resolution 1024x768 32bit Colors
Operating System: Microsoft Windows 2003 Server
Office: Office 2003 Professional
Network: 2 Network Card (RJ 45 standard)

Other Requirements

Other component required include: Router/ Switch, Network Cable (Cat 5E), Printers and Data Backup system

5.6 KJSLRMS Implementation

5.6.1 Program Implementation

5.6.1.1 Database management under KJSLRMS

The Microsoft Access database was used to support objects like tables and queries that in this case assisted in the establishment of the system. The table property of this version provided indexing services and appropriate tabling properties that suited the interfacing programming software (VB). Its ability to support advanced table and query relationships enables easy retrieval of relational data. This in turn generates perspective sensitive queries that allow the display of objectively stated output.

The student library record management system is a database, which was developed to assist librarians, administrators and teachers with many of the routine records management and tracking functions required in KJS. It provides the basic file structures to register students in both cases and programs of study, record students.

5.6.1.2 LAN system implementation

In general, the new KJSLRMS is management software that will be used by KJS to handle the Library records. Higher percentage of the administration, according to the conducted research supported the developed system. KJSLRMS will run over the school's LAN. The program has a central database file that can sit on the school's LAN and be backed up every day. Each workstation can access and update the same information.

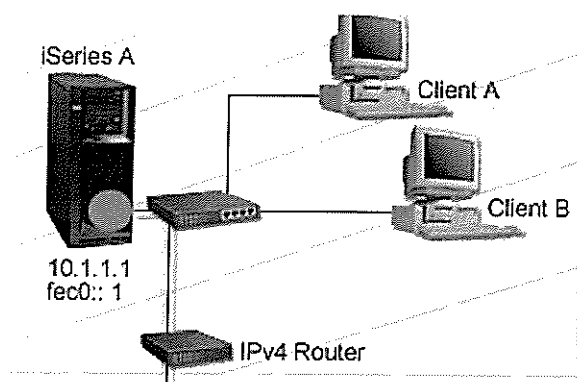


Figure 4.7 An illustration of the Network Layout Model of the Kabojja Junior School Library Records Management System.

Source: <http://www.digitalpeer.com/id>

5.6.1.3 Output Sample Test

The new system provided an arrangement of library records in customized library reports. Any change made to the results entry table was automatically reflected in the report. It ensured that the right data value was entered into the system and the data value was automatically updated into the database. The data should be an integer data type or text; otherwise the system will display an error message "Invalid data".

5.6.2 Implementation Approach

This involved conversion of the current system to the new system. A lot of care was taken at that moment to avoid any information loss. Conversion of hardware, software and the manual files into the new system was done using the parallel approach. The old and the new system ran concurrently until the new system showed reliability and the old system was abandoned.

5.6.2.1 Installing the program

The user must have a CD-ROM containing the software and the database file. The following are the procedures to be followed while installing; insert the CD-ROM into the CD-ROM drive. Create a folder named “KJSRMIS” on drive D note drive d is recommended because of the need to guard against eventualities of windows crashing before an updated backup has been made. Copy the database file with .mdb extensive and paste it in the created folder and then right click on it and send the short cut to the desktop.

Recording of stock books (inventory)

We record books/stock items and their call number, so that at a later point they are automatically picked from the inventory file and the system therefore computes their total value based on the books borrowed

Call numbers:

Every book is entered and allocated unique call number

Stock books are entered using data entry screens accessible only to privileged users

Book Grouping:

We allocate groups to various books belonging to the same group and this facilitates generation of meaning full reports.

We also enter the book location names so as to enable the system generate meaning full reports.

SCHOOL LIBRARY INFORMATION SYSTEM [Library Operations : Form]

Connection... Restore... Backup... Unhide Columns... Tools Edit

SYSTEM INITIALISATION	LIBRARY PAST RECORDS	BOOKS INVENTORY
☐ Enter New Subjects ☐ Enter New Book Locations ☐ Enter New Book Editions ☐ Enter Donors ☐ Enter New book Suppliers	☐ Past library report(Balances) ☐ Clear(Past records) ☐ End of year Procedures ARCHIVE LIBRARY BOOKS ☐ Send books to Archive	☐ Breakdown/View accession numbers ☐ Post Book Accession Numbers ☐ View posted Accesssion numbers ☐ View posted Scancodes ☐ Replace Book(not similar) ☐ Subject summary ☐ Books Archived summary ☐ BookStore ☐ Books value by Title ☐ Books value by subject ☐ Stock adjustment ☐ Books categorized ☐ Stock library report ☐ Update syllabus ☐ Current books on syllabus
BOOKS REGISTRATION ☐ Enter New Books (Call Numbers)	LOCATION UPDATE	
STUDENT-TEACHER REGISTRATION ☐ Enter New Staff ☐ Enter New Class ☐ Enter New Stream ☐ Enter New Students	Check Duplicated admissions	
	Set Library Reminders	
☐ Books inquiry		

ENTER BOOKS INTO THE INVENTORY

Steps of recording stock

Entering new Call numbers

Books purchased for the **first time** must be entered into the system and allocated unique codes (Call numbers)

Use a radio button labeled **Enter New books**

Accession numbering: The books entered into the system are given unique Accession numbers

Here you will enter a Call number in the (call no) field and then click on go. N.B The books with more than one call number will be displayed and it is from here that you will click on the number you want. To enter the accession number corresponding with the call number as expressed in the example below

After entering the call number, the system will tell the name of the book whose call number you have entered. If enter it wrongly, the system will send you a message “**the call number typed does not exist and then when you click ok it will ask you whether you want the system to generate for you some of the call numbers you might be looking for**” if you click on yes the system will try to help you look for some call numbers close to what you are looking for and they will be displayed in the assumptions list. Here you will look for the number you want, click on it and all its details will be displayed. Then after confirming click on **GO** to enter its accession numbers

Accession numbers entry

When you click on the **Go** button the system will display the form below and it is here that you will enter the accession numbers.

N.B

When you are entering the accession numbers of book, you must take note of the following,

- a. Type: This refers to the type of book you are entering that is has it been donated or bought directly by the school or from our sources **please you must indicate**.
- b. The **ISBN numbers, notes, and imprint** can always be got from the book it's self.

SCHOOL LIBRARY INFORMATION SYSTEM - [searchlist]

Connection... Restore... Backup... Unhide Columns... Tools Edit

Accession number	Type	BookName:	author:	Subject:	ISBN :	Collation:	Notes:	Imprint:	costprice:
454	DONATE	Study online to B. Lo	Donahue, Euge	Online studi					
56	DONATE	Study online to B. Lo	Donahue, Euge	Online studi					
676	DONATE	Study online to B. Lo	Donahue, Euge	Online studi					
*									

Record: of 3

start SCHOOLS MA... LIBRARY AUT... Libraryoperati... subcodes : Form searchlist SLIS2008 (D... EN 04

Posting to stock Register

After entering Accession numbers, Use the button labeled **Post books Accession numbers** to post to the stock/ inventory register to enable accurate reporting

UNIVERSITY LIBRARY INFORMATION SYSTEM (ULIS) [POST : Form]

Connection... Restore... Backup... Update Column... Tools

N.B Posting this information will update the books you have in stock and it will help you to have up to date library reports.eg Total number of books, Total of lost books etc

POST STOCK

Record: 1 of 1

start ULIS UNIVERSITY MAIN... LIBRARY AUTOMAT... Library operators... POST : Form 07:14

POST BOOK ACCESSION NUMBERS TO STOCK REGISTER

Note that when you record books accession numbers in (ii) above all your details are kept in a temporally storage and this is what we call the **Stock Audit Register**. Here it is possible to **Edit** this information and make any corrections. This is the information you enter when you click on **Breakdown/ view accession numbers**.

Note: After posting, that information will disappear and will have been posted to the stock/inventory register where you may not be able to see it.

Viewing posted Accession numbers

You can also view the posted serial number to do this just

Click on view **posted Accession numbers**

Or

Viewings posted scan codes

View posted scan codes that is if you had used a barcode scanner to enter those books into the system

After posting, the system will now be in position to generate the following reports

- 1) Subject summary (indicating the total number of books per subject)
- 2) The total number of books by location or shelf.
- 3) Report of books bought, money spent on purchases or donated in a specified period of time.

And many other exciting reports

REGISTERING OF STUDENTS AND TEACHERS

The system of registration has been divided into two categories;

- a. Registration of staff (Teaching and non teaching staff)
- b. Registrations of students

Registration of teachers

To register the teachers into the system just click on **Enter new teachers**. Note the system automatically assigns unique admission numbers for teacher all what you need is to enter only his or her name into the system

Registration of students

Before registering the students, you have to first enter the classes into the system, to do this just click on **Enter new class**

After completing the class registration, then you should click on **Enter new students** to enter the students into the system. N.B it is from here that you register new students in the system and also this form is used when changing the students name, class and stream as well.

The system automatically assigns admission numbers to the students registered. Optionally the school can provide admission numbers to be used by the system.

Note:

Please make sure that you indicate the class of any student you enter into the system

Recording of students borrowing and returning books

To get to this form, just click on **Borrowing/Returning of books**

The screenshot displays the 'SCHOOL LIBRARY INFORMATION SYSTEM [Library Orders]' window. The interface includes a menu bar with options like 'Connection...', 'Restore...', 'Backup...', 'Update Columns...', 'Tools', and 'Edit'. Below the menu is a form for entering student information, including fields for 'Client Account' (00-00488), 'Class' (S3), 'Stream' (R), 'Name' (Abago Rebecca), 'Program', 'Date' (25/05/2008), 'Regno', 'Library' (Makumbi), and 'Description' (Student). There are also buttons for 'Sort Students only', 'Sort Staff only', 'Show all', 'Advanced Search', and 'Search regno'. Below the form is a table for recording book borrowing and returning, with columns for 'Search by', 'General search', 'Accession n', 'Date Taken', 'Due date', 'Days Overdue', 'mark', and 'Category'. The table shows a single record for '25/05/2008'. To the right of the table is a 'STUDENT PHOTO' placeholder. At the bottom of the window, there is a status bar showing 'Record: 1 of 1' and a 'Break down book Accession nos' button. The taskbar at the bottom of the screen shows the 'start' button and several open applications, including 'SQL Server Enterprise...', 'New Folder', 'JatAudio', 'LIBRARY AUTOMAT...', and 'Library Orders'.

RECORDING DAILY BORROWING/RETURNING OF BOOKS

Data entry

We use the following screen to record the borrowing and returning of books. Here the user will simply indicate the account number of the student and the book Accession number and the system will tell him the book title after entering the Accession number. The system will also display all the books taken and returned by the student.

You can also use the same screen to break down a book into accession numbers and also to enter new record/ books into the system By just clicking on **enter new book**

Note: you can just use this same form to clear both those returning and taking books at the same time.

The system will also tell you the total number of books borrowed and even the total number of books returned by just filtering using the field called **Filter data**

Using the advanced search option on the form.

Procedure

Click on **advanced search** and then follow the instructions below.

Or

For the case of students with registration numbers you can enter their registration numbers in the **search regno** field and then press the enter button on your keyboard.

Method one.

Steps

1. Type some few letters of the name you want to find and then click on find.
2. Double click in the Client admission number (Student account number).

Clearing lost books

After clearing the returned books, the system will keep track of those books that have not been cleared on the students account and so if the librarian verifies that those books were lost by the student, then that implies that she or he (student) has to pay for those books

Use the button labeled **books returned by cash**

SCHOOL LIBRARY INFORMATION SYSTEM - [Cash]

Connection... Z A 2 1 Restore... Backup... Update Columns... Tools Edit

Client Account: 344 Class: S3
 Name: Makumbi Stream: Sciences
 Description: Student Payment Date: 11/05/2008

Total: 2 Advanced Search Search regno

Book Name	Accessionno:	Category	recieptno:	Amount:	markreturn:
Study online to B. Loner 12					☐
Study online to B. Loner 33					☐
*					☐

Record: 1 of 1

start SCHOOLS MANUAL... LIBRARY AUTOMATION Cash EN 04:59

Here what is required is the students account number and the receipt number and the amount paid for the lost book and after entering the student account number the system will automatically generate the books that have not been cleared on that specified account.

After clearing the system will now generate a report of;

- I. Those students who have cleared books by paying in cash.
- II. The total cash collected from lost books sorted on Faculty.

Reporting

System will help you to generate the reports below on daily basis.

SCHOOL LIBRARY INFORMATION SYSTEM [Statements - Form]

Connection... Restore... Backup... Hide Columns... Tools Edit

☐ Daily library Reports ☐ Library Reminder Notes(Students) ☐ General balance list ☐ General location balance list ☒ Tick datasheet/report Balance Per Class Ok Ok ☐ Balance Per Class/stream datasheet ☐ Book balance by Class (data sheet) ☐ General Analysis(data sheet) ☐ List of retained ID's ☐ Records missing Duedates ☐ Stock comparison reports ☐ Bookstatement ☐ Monitor book by Accession number ☐ Location movement report ☐ Library statement ☐ Staff/Student never borrowed(completely)	Please specify the date range and click appropriate button From 11/05/2008 To 12/05/2008 Select Class ☐ Books returned by students ☐ Books returned by Teachers ☐ Books returned by all ☐ Cash collection ☐ Days Analysis ☐ Specified Analysis(data sheet) ☐ General borrowing specified ☐ Student never borrowed specified(week,month,year) ☐ book bank report ☐ subject categorised ☐ snapshot
---	---

Record: 14 of 1

Start SCHOOL LIBRARY INFORMATION SYSTEM LIBRARY AUTOMATION Load Statements - Form

LIBRARY SUMMARISED REPORTS

CHAPTER SIX

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

6.0 Discussion

The research was centered at KJS where the Library records management system was carried out. Relevant related information was also gathered from different categories of old system users; the opinions on how to improve it were also collected. Such opinions which were pointed out were, the installation of appropriate programs ideal to be used perfectly in record management system, and reinforcing computer security by using a more centralized data storage and management system and also ensuring computer safety through the installation of anti-viruses. Questionnaires and Interviews were the methods used to collect data. Various sources of literature survey and review from books, journals, periodicals, newsletters, conference papers and internet were searched.

6.1 Conclusion

The study derived the following conclusions:

1. Any Library record management system is a basic and highly valuable part of a school. Students, teachers and administrators value library services as it's a means that the employees value them. This makes Library results recording a necessity for the school. The school administration always try to use whatever means possible to see that the records are securely kept in a way that should help both for students use and reference purposes. KJS tries all means to ensure a safe and reliable way of Library records management.
2. Results obtained from study indicated the strong need for the system development and implementation. The system was seen by the expected users as feasible and beneficial for KJS's Library improvement. The priority was given to the Librarian's office as a test office where the prototyping would be carried out with the provision of expanding to other office of the school as resources become available. The major immediate users of the developed KJSLRMS should include the: Principal, Head teacher, DOS, class teacher and Administrative Assistants.

3. The research has further indicated that the vital server which will control the system should be hosted in the Librarian's office for easy and secure records management but should be available to the rest of the other users indicated at their offices through the already established Local Area Network.
4. KJSLRMS has all important features for improving the old records management system. It caters for all objectives as stated in the study and the system design. The students of all classes will certainly enjoy the system as it improves the Library record management system to ensure the timely delivery of Library records mainly the Library reports. All of these are key to measure the Library performance of the students and the school as a whole. The users shall also enjoy on the fastest Library documentation processes. The computerization of the Library record management system would make KJS to become more efficient in managing the Library records. KJSLRMS is an asset to KJS although with the fast pace communication technologies, further research should be carried out to improve the efficiency of the system.

6.2 Recommendations

Major Library components recommended to begin with under KJSLRMS include: Students registration, Subjects records, book classifications, Library results approval process, clearance of school dues (library defaulters), production of Library clearance card, compilation and recording of Library results, preparation of results for Library Board approval, preparation of results, establishment of database for Library records management, production of administrative reports, and automated Library results processing. More could however be included in future as needs arise.

General recommendations include the following:

- a. **A System Administrator:** An experienced system manager is required to help the project on managing the system, risk management, action items, scope management, change management, budgets and expenditure, and project status report.
- b. **Reliable electric supply:** Reliability of electricity for the system is a crucial so as to avoid the high chances of losing the records. Hence to secure the data from the system, there is a need to connect the system to the electric back-up system such as a standby generator.

- c. **System maintenance:** Regular maintenance of the system should be considered as an important aspect for its sustainability.
- d. **Training to users:** Trained users of the system will help in the smooth running of the System.

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APPENDICES
APPENDIX 1: INTERVIEW GUIDE

Interviewee:-----

Date:-----

Time:-----

Place:-----

Subject:-----

Time Allocated	Interviewer: Makumbi Sulaiman. Question or Objective	Interviewee Response
4 min.	Open the interview: - Introduce ourselves - Thank Mr., Madam, ----- ----- for his/her valuable time. - State the purpose of the interview – to obtain an understanding of the existing Library management systems	
3 min.	Question 1: Is it a feasible and beneficial for a system to be implemented by the school?	

3 min.	Question 2: If we were to prioritize which office or departments would you recommend to implement this system as a modal and why?	
2 min.	Question 3: At which stage of the Library process would you consider crucial for the automated system? 1) Inventory management of books 2) Approval process 3) Clearance of fee for library defaulters 4) Library cards for students 5) Compilation and recording of library borrowers 6) Display of defaulters list. 7) Production of library Reports	
4 min.	Question 4: What do you foresee as possible limitations for the effectiveness of this system at the School?	
2 min.	Question 5: What categories of the School's staff should be considered to access the	

APPENDIX 2: QUESTIONNAIRE FORM

Preamble

The purpose of this questionnaire is to find out information regarding the Automated Library Records Management System in Kabojja Junior School. The finding of this research will be primarily used for academic purposes. All information provided in here will be treated with strict confidentiality.

NOTE: Please tick the box of your choice and fill in the blank spaces.

1. What are the Library rules and regulations guiding in using the library at your school?

.....
.....

2. (a) Is there any central meeting at your office which scrutinizes the already set up materials by the librarian?

☐ Yes ☐ No

(b) If YES, who is the chairperson of the above meeting?

.....
.....

3. (a) Is there any scrutinization of records questions to your school?

☐ Yes ☐ No

(b) If Yes, who is the head of the above meeting.

.....
.....

4. What is the percentage in relation to multiple choice, objective and descriptive questions at your school?

☐ 20% ☐ 40% ☐ 60% ☐ Above 70%

5. (a) Does your school computerize your Library system?

☐ Yes

☐ No

(b) If Yes, indicate the part of the system which are computerized.

☐ Principal

☐ Head teacher

☐ DOS

☐ Others

6. Indicate how the Library records are being managed.

.....
.....

7. (a) How are the Library records entered/stored in your school database?

☐ Using Black books

☐ Using Ms. Excel

☐ Ms.Access

(b) Who enters the Library results into your database?

☐ Librarian

☐ Class teachers

☐ Teachers

8. What exact part of the Library system would you like to be computerized and NOT to other parts of the system?

☐ Student Registration

☐ Library monitoring by teachers

☐ Compilation of Library results

☐ duction of report cards

9. (i)What do you think would be the merits of a computerized Library system at Kabojja Junior School?

.....
.....

10. (ii)What do you think would be the demerits of a computerized Library system at Kabojja Junior School?

.....
.....

11. (i) Do you prepare library reports at your school?

☐ Yes

☐ No

(ii) If Yes, mention the office responsible for preparing administrative library reports.

.....

12. What other additional information would you think by having or not having a computerized Library system will affect the school's credibility.

.....
.....

13. General comments on the computerized Library systems at Kabojja Junior School?

.....
.....

Thank you

APPENDIX 3: USERS PERCEPTION OF THE SYSTEM

Stage of Library records for computerization	% of respondents
1. Students registration	100
2. Subject records	100
3. Daily stock checking by the librarian	54.5
4. Library approval process	72.7
5. Verification process from the payments from defaulters	82
6. Issuing of library cards	63.6
9. Library monitoring by teachers	4.5 (not possible)
10. Compilation and recording of Library borrowers and those returning.	91
11. Database establishment of Library reports	82
12. Production of students' defaulters lists	95.5
13. Librarians office to host KJSLRMS	73 (others Principal)

Table 4. Users' perception on the use of different stages of Library Records Management System