

FoxPro 2.5 Based Serial Management System

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Discusses the different forms of serial publications and the ever-increasing trend in the number of publications over the years. Justifies the necessity of serials in academic and research libraries despite the huge expenditure incurred in their subscription. Considers the problematic nature in acquiring, managing and preservation of serials. Mentions the use of FoxPro 2.5 for windows to create the Serial Management System. Uses the Relational Database Management System to link complex data relations and FoxPro inbuilt Screen Builder is used to create user friendly interfaces. Describes the 9 database files used after simplification of the data structure. Discusses each module with its corresponding sub-modules, the I/O designs with pictorial presentation and the ways for accessing them. Concludes that the attempt to automate the serials management was successfully achieved.

0 INTRODUCTION

Serials are continuous publications without any predetermined end. Ranganathan (1967) defines a serial as, "Periodical publication of which each volume or each periodical group of volumes embodies more or less the same kind of information usually in the same pattern, mainly relating to its period of coverage. It is usually released complete as a volume".⁶ Serials may include periodicals; newspapers; annuals (reports, year books or year books supplementary to greater publication etc); journals, proceedings, transactions, memoirs etc, of societies; and numbered monograph series. AACR2 (1978) defines it as "A publication in any medium issued in successive parts bearing numerical or chronological designations and intended to be continued indefinitely. Serials include periodicals; newspapers; annuals; the journals, memoirs, proceedings, transactions, etc of societies; and numbered monograph series".¹ For the purpose of the present venture, serial is used as a blanket term to include periodicals, journals, official organs etc.

The significance of serials as a means of dissemination of knowledge has

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increased manifold. The magnitude of serial publications proves the growing recognition of their importance. Despite the enormous amount of cost tag to serial subscriptions, a fair amount of library budget is spent on acquiring serials in the library. This is mainly due to the fact that scholars' preference on primary information contained in serials is more than the secondary containers like books. Therefore, serials occupy an important place in an academic library. According to Vickery (1968) in 1965 there were 850,000 articles in the 26,000 serials held by the British Library Lending Division.⁹ Based on the data available from the Library of Congress Osborn (1980) estimates that by 1957 there were 639,000 serial publications and in 1971 there were 900,000 serials. He projected that by the year 2000, 1.5 million serials will be published.⁵ Information contained in periodicals is more up-to-date than that appearing in book form. Information on serials can appear within weeks of formulation whereas, in book form several years might lapse before it would finally appear. Many of the articles that appear in serials are never published in books. Many processes and techniques can be described fully in a few thousand words and need no expansion to a length sufficient for book form of publication.

Ashraf (1996) is of the opinion that, "Serial work is entirely a problem area. By nature serials are individual, erratic and unpredictable. The routines involved are incessant and subject to change. To combat and control the bizarre world of serials, computer has emerged as a very effective tool. Today computerized serials control is widely replacing the manual system".² A serial can split to any number or it may change its area of coverage or it may change its title or even get suspended for a variable length of time and continued or it may totally cease to exist. Serials management is where chaos and confusion are prominent. This unique characteristic of serials has major resource implication for preservation efforts, in terms of both financial and space commitment. The decision to acquire, keep and preserve a serial title is not a one time endeavour but an ongoing commitment.

Libraries are moving fast towards automation owing mainly to the boom of the Information Technology (hereafter referred to as IT). IT has touched almost every walk of life and libraries are no exception though the pace of library automation is much slower than expected in the developing countries. In India, automation is evident in most of the special libraries that have a bit of national importance. Academic libraries like the university libraries are picking it up fast. This is an era when libraries can no longer afford to remain aloof of all the developments and changes that are taking place in the field of IT. Sooner or later, libraries that are not automated will become cut-off from the rest of the world. There are a large number of journals being brought out in CD-ROM format. This is one such example of why libraries need automation. However, we will not dwell upon the need of automation rather we will discuss more on the management of serials within a library system.

1 SERIAL MANAGEMENT SYSTEM (SMS)

With the complexities involved in managing serial publications, an attempt is made to develop software that will manage and process the serial section of a library. In due course of time it is intended that the software will cover all sections of the library. The software is called the **Serial Management System**, hereafter referred to as SMS. Basically, SMS was created to conduct an experimental study on how a user friendly FoxPro 2.5 based software can be developed keeping in mind the requirements of university libraries in India. Library professionals often find themselves at loss with the available off-the-shelf software. This is due to the fact that developers of such softwares have their own way of defining how a library system works. Here, a university library namely, North-Eastern Hill University's Central Library is taken into consideration and each step follows the manner and function of the existing system. Those already working in this Library will find SMS quite familiar and easy to access. Since, the university libraries and libraries all over India follow almost the same pattern, SMS will probably serve the purpose of other libraries in India as well.

According to Elmasri (2000), "databases and database system have become essential components of everyday life in modern society. In the course of a day, most of us encounter several activities that involve some interaction with a database". Database Management System (DBMS) has gained momentum in its different forms of application. The type of database used in library system is mostly the traditional database application. These types of databases are mainly textual and numeric. Taxali (1996) defines FoxPro as "one of the leading DBMS software. It is also called the Relational Database Management System (RDBMS)" because of the Relational Databases it provides. Siegel (1994) stated that, "Earlier versions were DOS, UNIX and the Macintosh. Because of the differences among these operating environments, there have to be some differences among these versions of FoxPro 2.5, but these are relatively minor".⁷ With the ease to share data easily among applications, files and several other advantages that it has over FoxPro for other operating environment FoxPro 2.5 for windows has been used.

In order to achieve maximum data security and the user-friendly interface FoxPro 2.5 built-in Screen Builder is used to create the menus. Each module was created with the source code available with the FoxPro 2.5. This source code mainly meant for development of Database Management System was found suitable and accommodating.

2 THE DATABASE DESIGN

A process called normalization is used to refine data structuring. Awad (1998) opines that, "Data are grouped in the simplest way possible so that later

changes can be made with a minimum of impact on the data structure. When too many attributes are grouped together to form entities, some attributes are found to be entities themselves. Further normalization of these entities into attributes linked by common data elements to form relationships, improves the effectiveness of the DBMS".³ Each database file has one or more unique keys that help in identification and setting relations between files. For examples in the 'master database file' the field 'supplino' is a unique key used to link the supplier database file. Therefore, such fields used for linking files are unique keys and reduce data dependency. Altogether 9 database files are used and some of them like the user database file can be shared with other sections other than the serial section.

21 THE MASTER DATABASE FILE

The master database file consists of 10 fields comprising of:

- (i) The serial title.
- (ii) Frequency or periodicity of the serial.
- (iii) *SMS generated* maximum issues expectable in a year.
- (iv) The volume number and issue number last received.
- (v) The *SMS generated* supplier's number that is also a unique key relating the master file with Supplier's file.
- (vi) The International Serial Standard Number (ISSN) of the serial.
- (vii) The *SMS generated* publisher number that is also a unique key that relates the master file with the publisher file.
- (viii) The place where the serial is being published.
- (ix) The *system generated* code assigned to the department each time a new department is added.
- (x) The subject/s covered by the serial.

22 BUDGET DATABASE FILE

The *budget database file* is used to record the amount of budget allocated to the library for serial subscription on a yearly basis. It has 3 fields in all as given below:

- (i) The financial year ending for which the budget is allocated to the library by the university.
- (ii) The total amount of budget.
- (iii) The amount spent till date.

23 DEPARTMENTAL BUDGET ALLOCATION FILE

After a budget is passed for serial subscription for the library in lump sum

library has to re-allocate or divide the amount of budget to each department depending upon the assumed requirement of each department. This is done on a yearly basis. This database file comprises of 5 fields:

- (i) The year for which the budget is allocated to the department. This will correspond with the year ending in the budget file.
- (ii) The amount allocated to each department.
- (iii) The amount spent so far by the department.
- (iv) The balance amount till date.
- (v) The code assigned to the department which corresponds with that of the master.

24 PAYMENT DATABASE FILE

The payment database file stores the payment made to the supplier for each serial title. The database has the following fields:

- (i) The title of each serial.
- (ii) The Price of each serial.
- (iii) SMS generated supplier number.
- (iv) Invoice number that is to be assigned by the library.
- (v) SMS generated department code.
- (vi) The date from which subscription starts.
- (vii) The date on which current subscription will terminate.

25 PUBLISHERS' DATABASE FILE

The publishers' database file maintains all information on the publisher of each serial. Most of the fields other than 1 to 4 are optional. From field number 3 and 4, either one of them has to be filled.

The fields of the database are listed below:

- (i) Name of the publisher.
- (ii) SMS generated publisher number.
- (iii) Place of publication.
- (iv) City where published.
- (v) State where published.
- (vi) Country of publication.
- (vii) Postal Index Number.
- (viii) Post Box

- (ix) Post Office.
- (x) Phone Number.
- (xi) Fax Number.
- (xii) E-mail address.

26 SUPPLIER DATABASE FILE

The supplier database file stores all information on each serial supplier. In a supplier supplied 2 or more titles than the supplier's name will not be created whereas, two different suppliers with the same name will have different supplier number. Field numbers 4-6 and 11-13 are optional.

The fields are:

- (i) Suppliers' name.
- (ii) *SMS generated* supplier's number.
- (iii) Place where the supplier can be located.
- (iv) Street.
- (v) Post Box.
- (vi) Post Office.
- (vii) State .
- (viii) Country.
- (ix) Postal Index Number.
- (x) Phone Number.
- (xi) Fax Number.
- (xii) E-mail.

27 DEPARTMENT DATABASE FILE

The department database file records only the name of the department and *SMS generated* department code. This small file is created to reduce data dependency. The fields are:

- (i) Name of the department.
- (ii) Code assigned to the department.

28 VOLUME AND ISSUE DATABASE FILE

The volume and issue database file will store each volume number and issue number of a serial received by the library. The volume number will be generated by the system when the number of issues is completed and incomplete volumes are not created by the system. The fields are:

- (i) The ISSN of the serial title.
- (ii) The complete volumes received.
- (iii) The number of issues received.
- (iv) Date of receipt.

291 USER DATABASE FILE

User database file stores information on the users who will have access to the system. In later enhancement, this file can be shared with almost all sections of the library. The fields are:

- (i) Library card number.
- (ii) Name of the User.
- (iii) Password (if any).
- (iv) Status or level to which access is permissible.

3 THE MODULE DESIGN

The module has been divided into 6 sections, namely - Master, Finance, Reminder, Search, Tools and Reports. Again each module has sub-modules attached to it. The number of sub-modules varies from 1 to 4 sub-modules. The Search module has the maximum sub-modules.

Main	Finance	Reminder	Search	Tools	Report	Exit
Edit, Delete & Add New Serial	Record Budget for Serial Section	Missing Issues	Search by Title	Change Password	Departmental Serial Report	
Check in New Issues & Volume	Allocate budget to Departments	Due for Renewal	Search by Subject	Add & Delete Users		
	Subscription Payment		Search by Supplier			
			Search by Department			

Fig 1 The Module Design each attached with its sub-modules

3.1 MAIN

Edit, Delete & Add new subscription: This module allows users to add newly subscribed serial titles and edit existing ones. In case a publication is

discontinued and library finally decides to delete the records, it can be done here. Addition, Edition and Deletion of both publishers and suppliers are allowed only in this module. Suppose certain serial wishes to change the frequency of publication than that can be taken care here.

Check in issues and volumes: The module accommodates each issue number and corresponding volume number. Missing issues are noted by the system through this module. The interface does not allow duplication of issue numbers and volume numbers are generated by the system depending on the frequency of the serial.

32 FINANCE

Budget record for serial section: Libraries are allotted with a certain amount of budget for the subscription of serial. This allotted amount along with the amount spent for subscription and the subsequent balance are stored so as to enable the user to always have the financial position easily accessible. Duplicate entry is not allowed.

Budget allotted to the department: The lump sum amount for serial subscription allotted to the library is again re-allotted to each department. This module keeps track of all the amount allotted to each department and the amount spent on serials subscription. This way each department's expenditure on serials subscription is recorded.

Subscription Payment: Library needs to keep record of all the payments made to each supplier as subscription fees. This allows the users to keep track of which serial is being due for payment and to which supplier payment has to be made. In case a subscription has been due than the SMS will automatically issue a reminder to the library.

33 REMINDER

Missing issue: Library needs to know which issue was not received and what uniform action has to be taken. The SMS will notify the library that particular issue has not been received and provide information on the number of days or months the issue was not received from the due date. The system will also suggest certain action like sending reminder or asking for refund as found appropriate by the policy makers of the library.

Due for renewal: Subscriptions due for renewal are kept for each serial and the system notifies the library that such and such serial titles are due for renewal. This helps the user in keeping track of renewals to be made instead of waiting for the suppliers to send reminders or going through the arduous job of going through lengthy records. The system also provides the date on which a subscription terminates.

34 SEARCH

There are four search facilities provided by SMS. These searching facilities are designed keeping in mind the user requirements. However, search facilities like Online Public Access Catalogue (hereafter referred to as OPAC) are yet to be incorporated. Search can be done through title of the serial, subject coverage, department, the place, the order and the supplier of the serial.

- *By title:* Users can search the database by the title of the serial. This not only provides name of the titles but also information on the serials like publisher, last volume and issues received by the library.

- *By subject:* The serials can be searched by subjects. For examples by entering economics all the titles that cover economics as a subject will appear along with name of the publisher, volume and issue last received and name of the supplier.

- *By department:* The database can be searched by the department that orders the subscription. By choosing one of the departments listed, all the serial titles ordered by the department will appear along with the name of the publisher, volume and issue number last received and the suppliers' name.

- *By supplier:* Serials supplied by a particular supplier can be searched by selecting the listed supplier. If a supplier's name is selected all the titles supplied by that supplier will appear.

35 TOOLS

The tools incorporated herein can be used with other sections of the library. Basically, it is the circulation desk that will use more of this. However, users can change their password using this facility.

- *Change password:* Users can create and change password here. To do this, users have to first enter their correct library card number and log-in name provided by the library.

- *Add new-user:* New users can be added and existing ones can be deleted here. An authorized operator only can do this.

36 REPORT

The report allows viewing and printing of information on the serials. The main heading that can be viewed and printed in a file or printer are title, frequency, publisher, place of publication and the subscription price. For the time being only the department-wise report is incorporated.

37 EXIT

- When the user wishes to quit, this module will terminate the application.

4 INPUT/OUTPUT DESIGN

The input/output has been designed to achieve maximum user-friendly interface. In order to make things easy for the users, 22 interfaces have been created. Some of the interfaces are only part of a main interface and that can be accessed from a main interface only. There are two message boxes, one 'NOTIFICATION MESSAGE' and the other 'ERROR MESSAGE'. The first interface that will appear is the user validation menu.

The screenshot shows a window titled "The Serial Management System" with a subtitle "An experimental proof developed by:- Mr.PAOKHOLUN HANGSING DCA 99 00, Roll No.996012". The main content area is titled "USERS' ENTRY VALIDATION" and contains the instruction "Enter your correct identification". Below this are three input fields: "User Name" with the value "HANGSING", "Library Card No" with the value "Ichans", and a "Password" field. At the bottom, there are three buttons: "LOGIN", "LOGOUT", and "CANCEL".

Fig 2 Users Entry Validation

User's entry validation: To log-in and access the SMS one needs to first enter his name and library card number. Password is optional. The system will search the user database and if the identification entered by the user is found then access to the system will be permitted. If users have not previously registered themselves with the library then the system will deny access. In case, the users have created their own password then they will have to enter the correct password.

After successful entry, the system will display the main module from where one can have access to the sub-modules depending upon the level of access being permitted to the user. One can access the module through the keys as shown in Fig 3.

SERIAL MANAGEMENT SYSTEM					
M: in	Enter at <i>Finance</i>	Reminder	Search	Tools Reports Trade	Exit
			Search by Titles		
			Search by Subject		
			Search by Department		
			Search by Supplier		

Fig 3 The module bar of the SMS

Serial Database

<p>Serial Title [TTI MITAL ADITIATI] <input type="button" value="v"/></p> <p>ISSN [421 6878]</p> <hr/> <p>Frequency [MONTHLY] <input type="button" value="v"/></p> <p>Expected Max Issue [12]</p> <p>Volume Last Received [0001/000]</p> <hr/> <p>Publisher [SCHOLAR PUBLISHING HOUSE] <input type="button" value="v"/></p> <p>Place [DELHI]</p> <hr/> <p>Supplier Name [CLIENT BOOK SELLERS] <input type="button" value="v"/></p> <p>Supplier No [CLP-000002]</p> <hr/> <p>Department [COMPUTER SCIENCE] <input type="button" value="v"/></p> <p>Subject [SCIENCE]</p>	<p><input type="button" value="EDIT/UPDATE"/></p> <hr/> <p><input type="button" value="DELETE"/></p> <hr/> <p><input type="button" value="SAVE/CONTINUE"/></p> <p><input type="button" value="SAVE/EXIT"/></p> <p><input type="button" value="CANCEL"/></p>
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Fig 4 The Serial Database

Note - All information provided herein is fictitious

41 EDITING, DELETING AND ADDING SERIALS

This interface is where all the details about each serial will be entered. Clicking at the drop down menu button of the title one can enter new serial titles. The list of serial titles will be displayed and at the top of the list is the word "ADD NEW". By choosing "ADD NEW", a menu for adding new serial title will appear where the title and ISSN of the serial has to be entered. The frequency list is an in-built and one has to choose any of the frequency from the list. As far as possible all types of serial frequency have been built into it. When a frequency has been selected the system will give the number of issues expected in a financial year. Volume last received is entered from other menu. Name of the

publisher if not already in the list has to be entered by selecting "ADD NEW" from the list of publishers. When new is selected another menu for entering new publisher's name will appear. The user has to enter the name of the publisher and the address details of the publisher. The place of publication is selected by the system. In the absence of the city, name of the state will be highlighted. Similarly, if the supplier's name is not in the list 'ADD NEW' has to be selected and a menu for adding the supplier's information will appear. The supplier's number will be automatically generated by the system. Similar is the case of the department. The subject enshrined in the serial has to be carefully entered by the user. When every entry is made one has to click the "SAVE/CONTINUE" button to save and continue working or "SAVE/EXIT" to save and quit or click the "CANCEL" button to exit without saving it. The "EDIT/UPDATE" button will allow the user to edit existing information and the "DELETE" button will be used to delete the existing record.

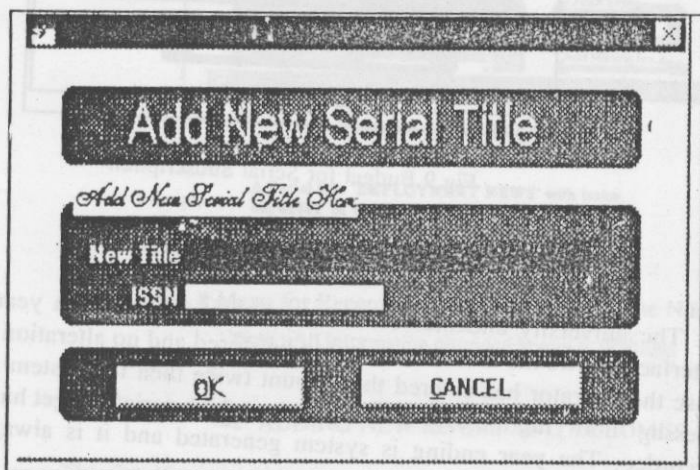


Fig 5 Menu for adding new serial titles

The menu to **add new titles** is accessed from the main menu when "ADD NEW" is selected from the serial title list. It allows the users to enter the new serial title and the corresponding ISSN. If by mistake a duplicate entry has been made the system compares the ISSN of both entries. In case both have the same ISSN, a message box will notify the user of the duplicate entry.

The menus for **adding new suppliers and new publishers** are identical in nature. They are both called the main menu. In case of duplicate entry the system

Add New Suppliers

Supplier Name: GREAT BOOK SUPPLIERS

Supplier No: GRE.000012

Address

Place: GREAT PLACE Post Office No: _____

Street: EDEN GARDEN Post Office: _____

City: CALCUTTA Phone: 0 _____

State: WEST BENGAL Fax No: 0 _____

Country: INDIA E-mail: _____

Pin code: 432 345

OK CANCEL

Fig 6 Add New Supplier

Note - All information provided herein is fictitious

Add New Department

Add New Department Here

Department's Name

Department's Code

OK CANCEL

Fig 7 Menu for Adding New Department

notifies the user that duplicate entry has been made. The supplier and publisher numbers are generated by the system.

The menu for **adding a new department** works almost in the same as that of other interface. Duplication is checked by the system and department-code is auto-generated by the system.

CHECK IN NEW ISSUES

Select the Title
Serial Title: EMPLOYMENT NEWS

ISSN: 4312 3462 Receive Date: 25.07.2008

Last Volume/Issue Received: 0001/0002

Enter Issue/Volume Number
Issue Number: 1

Check Entry
CHECK

Add Missing Issue

Error Message!
Note the Error Message and Click OK.

A Serial title 'EMPLOYMENT NEWS' with issue no. '0001' of volume no. 0001 already exist.
Kindly check your volume and issue number...

Fig 8 Menu for Recording New Issue and Volume Numbers

Note - All information provided herein is fictitious

42 ADDING NEW ISSUES AND VOLUMES

This interface provides users to record each issue received in the library. One has to choose the title from the title drop down menu and enter the issue that has arrived. In case the issue entered is earlier than the last issue already recorded all other buttons except the "CANCEL" and "BACK ISSUE" button will be disabled and the "BACK ISSUE" button has to be clicked. The "BACK ISSUE" button will arrange the back issue that has finally arrived in a proper order in the database file but issue last received will remain the same. Once the correct issue and volume numbers are entered "SAVE/CONTINUE" or "SAVE/EXIT" button has to be clicked and if the entered issue comes in proper order then issue last received will visibly change. The ISSN and the received date are not accessible yet. The ISSN number will remain the same as entered previously and received date will always be current date. The interface also checks errors like entry of the same issue/volume number already recorded. In case of duplicate entry by mistake an error

message will appear notifying the user by giving the name of the serial, issue and volume that was already entered. In case payments are due then the system will also issue a reminder to make necessary payments.

Budget for Serial Subscription

Amount for Year Ending

Total amount allotted 0.00

For the year ending

Check Save Cancel

Fig 9 Budget for Serial Subscription

43 SERIAL BUDGET ALLOCATION

The university allocates certain amount of budget on a yearly basis. The interface allows the allotted amount to be stored and no alteration is allowed. In case the operator has entered the amount twice then the system gives an error message notifying the user on the year for which serial budget has been already recorded. The year ending is system generated and it is always the current financial year.

44 BUDGET ALLOTMENT TO THE DEPARTMENT

The budget allocated to the library for serial subscription is again allotted to each department. This is because in the sample library, the authority to order subscription is vested in each department. Therefore, each department is allotted a certain amount of the total budget depending on the assumed requirement from the drop down list and enter the amount allotted to the department. The financial year for which allotment is made will remain the current financial year and alteration of the year is not permitted. After appropriate entry is made the "Allocate" button has to be clicked and duplication of entry, if any, will be notified. However, in the case of the entry not made in the previous budget menu

for the current financial year, the system will notify and prompt the user to make necessary entry by calling the library budget interface. The interface is also used for recording payment made on behalf of the department and checking of balance for each department.

Fig 10 Departmental Budget Allocation

Note - All information provided herein is fictitious

45 SUBSCRIPTION PAYMENT

The interface is used for recording payments made to the supplier of the serial. On selecting the listed serial from the drop down menu of the supplier and the department that authorized the ordering, will appear. Subscription cost, invoice, date on which subscription starts and expires has to be entered. This menu can also be used for checking what amount has been paid and when the subscription will start and terminate. It is assumed that library will pay the whole amount of cost for the whole period of subscription that is recorded as shown in Fig 11.

46 REMINDER: SUBSCRIPTION DUE

The date on which subscription of a serial terminates can be checked here. Users have to choose the title of the serial from the drop down list, then the corresponding information like ISSN, Invoice No., Suppliers's Code and Name of the supplier will be displayed. The date by which subscription will terminate

Subscription Payment

Description
Serial Title: FRONTLINE

Supplier's Name: CLIENT BOOK SELLERS
Department Name: GENERALIA

Subscription specification

Subscription Cost: 543
Invoice No: fr2k

Subscription starting/ending date
Subscription starting date: 12/12/2000
Subscription expiry date: 12/12/2001

CHECK SAVE/CONT SAVE/EXIT CANCEL

Fig 11 Subscription Payment

Note - All information provided herein is fictitious

will be shown on the text-box marked as 'due date' and circled in red. In this reminder all the text-boxes are ment only for displaying and user will not be able to enter anything in the text-boxes (Fig 12).

Reminder 1 : TITLES DUE FOR RENEWAL

Serial Titles: ECONOMIC TIMES

ISSN: 1234 3211
Invoice No: wer
Supplier No: BOO.000010
Supplier's Name: BOOKLAND

12/12/2001

Exit

Fig 12 Reminder for Renewing Subscription

Note - All information provided herein is fictitious

Reminder 2 : ISSUE NOT RECEIVED

Serial Title: **SOCIAL SCIENCE ASBTHAGI**

Specification	Supplier
Issn: 3421 4567	Supplier No.: CLI-00002
Invoice No: 2k/abw/1	Supplier Name: CLIENT BOOK SELLERS

Missing Issue Numbers
2,3

Exit
Quit

Fig 13 Reminder for Issue not Received after the due date

Note - All information provided herein is fictitious

47 GENERATING REMINDERS ON MISSING ISSUES

This reminder notifies the user which issue has been missing. Like the previous reminder one has to select a title from the list by clicking the arrow button of the drop down menu. Once the title is selected the system will list all the missing issue numbers along with other information of the serial like invoice number, supplier's name and code. Not only does it list the missing issues it also notifies the user of what action has to be taken. The actions include "ISSUE REMINDER 1/2/3" or ask for refund. Reminders to be sent to the supplier are of 3 types and finally asking for refund will follow. This is built into this system due to the fact that libraries either forget or become careless about issues not received. Since, newly entered serials are already in the list the message box will promptly notify when to start expecting that title in case it has been selected from the list.

48 SEARCHING BY TITLE

This search will only list the existing serials available in the library. Users have to click the arrow of the drop down menu to see all the titles in alphabetical orders. On selection of any title, name of publisher, latest volume and issue received separated by a slash and name of the supplier will be displayed. Since,

searching for abstract and content of a serial can be provided through other applications like OPAC, it has been separately taken into consideration for future enhancement (Fig 14).

SEARCH BY TITLE

Title: CHEMICAL ABSTRACT

Specifications

Publisher: SCHOLAR PUBLISHING HOUSE

Issue last received: 0001/00003

Supplier: CLIENT BOOK SELLERS

EXIT

Fig 14 Searching by Serial Title

Note - All information provided herein is fictitious

491 SEARCHING BY SUBJECT

Unlike the previous interface, searching by subject is done through the subjects that the serial is expected to include in its scope of coverage. User has to first choose the subject that will be listed in the drop down menu then on selection of any of the subject, all the serials that fall into that subject will be listed in the drop down menu labeled "TITLES FOUND". To see more details on any chosen title, one has to select the particular title again from titles listed under that subject. On selection of a title, name of publisher, latest volume and issue separated by a slash and name of the supplier will be displayed. Subject search is to be enhanced in later stage when OPAC is developed(Fig 15).

492 SEARCH BY DEPARTMENT

This interface facilitates users to choose the department on which search is to be done. On selection of any department, the serials subscribed under the selected department heading will be listed in the drop down menu labeled "TITLES SUBSCRIBED". On further selection of the titles already listed, name of publisher, latest volume and issue and supplier's name of the selected titles will

SEARCH BY SUBJECT

Select the Subject **ECONOMIC**

Titles Found **ECONOMICA**

Publisher **ECONOMICAL SOCIETY**

Issue last received **0001/00002**

Supplier **UNIVERSITY BOOKS**

How to use Subject search:-

1. Select the subject first and foxpro will display the titles under the subject.
2. Then choose the title and details about the chosen title will be display.

EXIT

Fig 15 Searching by the Subject Coverage
 Note - All information provided herein is fictitious

be displayed. No alteration whatsoever is allowed. This interface is meant only for display (Fig 16).

SEARCH BY DEPARTMENT

Instruction:- 1. Select the Department and the titles subscribed will be displayed.
 2. Then CHOOSE a title and details about the chosen title will be displayed.

Select the Department **BIOLOGY**

Titles Subscribed **GEOLOGICAL SURVLY**

Publisher **DECCAN PUBLISHER**

Last Issue **0001/00001**

Supplier **DECCAN BROTHERS**

EXIT

Fig 16 Searching the Serials by Department
 Note - All information provided herein is fictitious

493 SEARCH BY SUPPLIER'S NAME

This search allows users to select any supplier listed alphabetically in the menu labeled 'SUPPLIER'S NAME'. On selection of any supplier all the serials supplied by the selected supplier will be listed alphabetically in the drop down menu labeled "TITLE SUPPLIED". On further selection of any of the listed title, publisher, latest volume/issue and supplier's code will be displayed (Fig 17).

Search by Supplier

Select the supplier:

Supplier's Name:

Titles supplied by the selected supplier:

Title's Supplied:

Specification:

Publisher:

Last Issue:

Supplier No:

Exit:

Fig 17 Searching by Supplier's Name

Note - All information provided herein is fictitious

494 ADDING AND DELETING USERS

The system administrator can add new user here in this interface. The details of the existing users can also be accessed and edited or even deleted from this interface. The level, to which access will be permitted, as determined by the administrator, has to be selected from the level already listed. User's level of access is differentiated in order to maintain system security. All users have to register themselves first in this "USERS' ENTRY UPDATE". Only after registration is done one can access the system (Fig 18).

495 GENERATING REPORT

Generation of a report (Fig 19) is done on current subscriptions on the departmental basis. By selecting the department from the list there are three options:

Users' Entry Update

Login Name: NEWUSER

Library Card No: lcnw

Password:

User's Status: LEVEL#3

Edit:

Delete:

Add Buttons:

SAVE/CONTINUE SAVE/EXIT CANCEL

Fig 18 Recording and Deleting Users

Note - All information provided herein is fictitious

Report on Departmental Serial Subscription

Select the Department for which you would like to report.

Select Department: BIOLOGY

View Report Print Report Exit

Specify the Filename wherein you will save the Report

File Name:

File Report

Fig 19

Note - All information provided herein is fictitious

- (i) The departmental report can be viewed by clicking the "VIEW REPORT" button.
- (ii) Get printout by clicking the "PRINT REPORT" button.
- (iii) It can be saved in a file by giving a proper file name and then click the "SAVE REPORT" button.

5 CONCLUSION

The SIS created has been tested successfully. Among DBMS softwares, FoxPro 2.5 stands out distinctively in handling complex databases owing mainly to its relational setup. This ease of creating relations among files can do wonders in managing database. The interfaces developed are user friendly. However searching can be made more powerful in future by allowing Boolean search and search through dictionary of terms or vocabulary control tools.

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