CASE STUDY 1

A SYSTEM FOR JOURNAL ACQUISITION

Statement of Problem

A small library in an educational institution subscribes to 300 journals. It is desired to automate the journal acquisition and subscription system. We will follow the steps given in Table1 to analyze and design the system. The first step in design is fact gathering. The outcome of fact gathering is given below.

FACT GATHERING AND REQUIREMENTS SPECIFICATION

i)   <u>Hierarchy chart of the organization</u>

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        ┌─────────────────────────────────────────┐
        │               LIBRARIAN                  │
        └─────────────────────────────────────────┘
                          │
                          ▼
        ┌─────────────────────────────────────────┐
        │      DEPUTY LIBRARIAN JOURNAL            │
        │           ORGANIZATION                   │
        └─────────────────────────────────────────┘
                          │
                          ▼
        ┌─────────────────────────────────────────┐
        │                                         │
   Programmer                            Library assistant
```
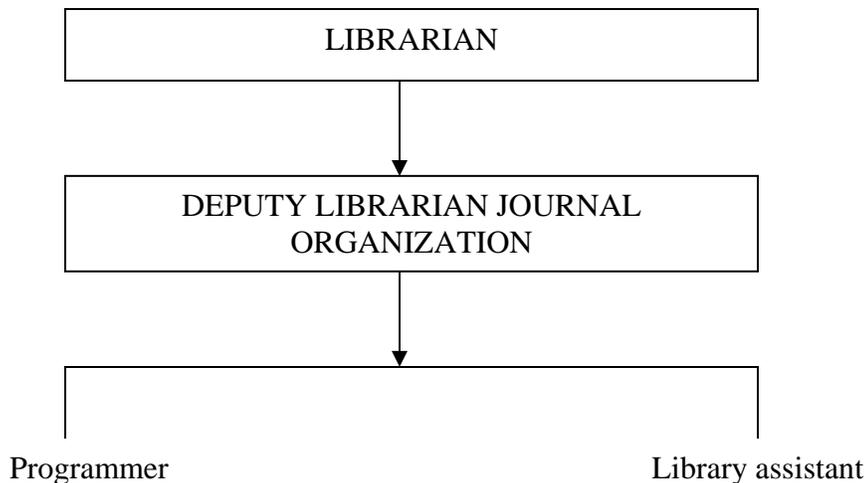
ii) List of persons to be interviewed

   a. Librarian overall incharge of library
   b. Deputy Librarian incharge of journal acquisition
   c. Library Assistant who assists deputy librarian

ii) Questions to be asked

   a. Why is the computer-based system being considered?
   b. What are the basic objectives of the proposed system?
   c. What is the volume of data to be processed?
   d. What is the frequency of processing?
   e. What are the benefits expected from the system?

iii) Records of Discussion:

    a. About 300 journals are subscribed by the Library, with periodicity varying from half yearly, monthly and quarterly
    b. The journals mostly come from abroad by surface mail and take approximately three months to reach from the date of dispatch
    c. Loss of journals in mail and delay on publication is also noticed
    d. If a journal is missed and a request for replacement is sent promptly the publisher normally sends the duplicate copy free of charge
    e. If the request is not sent promptly then it would be difficult to get the free copy
    f. Most subscriptions are to be sent in November well ahead of start of new year.
    g. As foreign exchange payment is involved, renewal an payment is required to be made in advance

Currently the entire system is manual and is done by two scientific assistants. They handle approximately 50 journals per week. It is found that follow up of journal acquisition is time consuming and error prone. It is felt that follow up will be easier and faster if a PC is used. As the volume of transactions is not large a standard PC configuration (P4 or AMD processor, 128 MB main memory, 40GB disk, CDROM, floppy disk, 15'' monitor, standard key board, Windows2000, MSOffice) will be quite adequate. A programmer will develop all the application software in 2 or 3 months. The system is cost effective and is feasible. A detailed feasibility analysis is not essential in the problem.

The basic objectives of the system are:

    a. To follow up regularly receipt of journals, promptly detect delay in receipt of an issue and send a reminder to the journal publisher
    b. To follow up with the publisher to send invoice for journal subscription well ahead of time
    c. To renew subscriptions of journal promptly
    d. To print out each week a list of journals received to be displayed so that users know of the arrival of journals
    e. To answer queries about the status of subscription, receipts, missing issues, etc, of any journal in the collection

The main benefits expected by using the computer–based systems are
    a. Prompt follow-up with publishers to get replacement of missing issues of journals
    b. Prompt renewal of subscription and follow up with accounts section. This will avoid late payment of subscription and consequent cancellation of subscription and missing/late issues.
    c. Ability to answer enquiries about receipt of journals
    d. Analyze budget for journals, allocation of money to different disciplines.

iv) Document flow diagram

Journal order and cheque
Remainder for journals
Remainder for invoice

```
                                    Invoice
Publisher ──Invoice──▶ Receiving ────────▶ Journal
          ┄┄┄┄┄┄┄┄┄▶  Office              Processing
            Journals                      group
                              Received
                      ┆       Journal
                      ┆       Information
                    Journals
                      ▼
                   Library  ◀──Journal received list──
```

Invoice +
Indent reference +
cheque

Indent

Purchase
section

Accounts
section

Invoice
copy

Journals for binding list
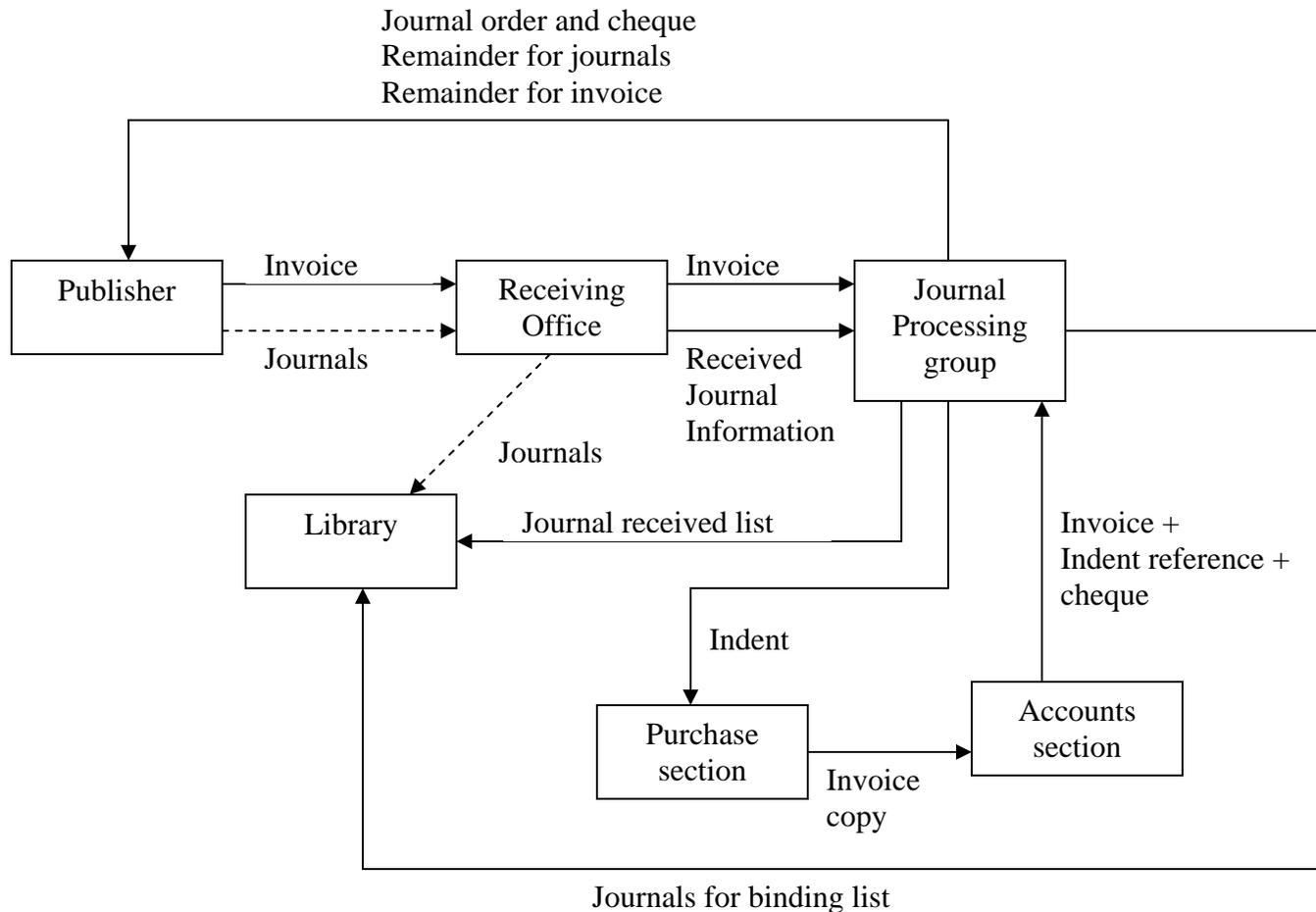
The outputs required from the system and frequencies of outputs are described below:

a. List of journals received - each week
b. List of completed volumes ready to be bound – Once a year.
c. Journal renewal with subscription to publishers - Before Nov 30 , each year
   starting on November 1.
d. Reminder to publishers on non-receipt of journal – Aperiodic
e. Indents for journal procurement to be sent to Accounts section – Before Nov1
   each year starting Oct 1

Feasibility of the system
We saw that the system is fairly simple and straightforward to implement and can be
done with just 1 PC. The benefits here have already been listed. The cost is just that of a
PC with system software and applications. It is around Rs 35,000 at 2005 prices.

SYSTEM SPECIFICATIONS

(i)   Detailed DFD

Request for missing journal issue

3
Generate reminder

Journals not received

Journal publisher master

Publisher

1
Check with order

Received journal details

Received journal details

2
Update journals received and print

Weekly list

Library office

Request for invoice

Journal master

Journal expected

Journal Received file

Journals ready for binding

4
Renewal process

Generate Indent

Purchase section

Payment authorization

Accounts section

Invoice for renewal

Journal master

Journal publisher master

5
Send Payment

Draft details with invoice copy

Payments detail with Invoice copy

Journal master

Journal publisher master

Journal payment Detail file

The functions of the each process in the DFD are as follows:

Process 1:

1. When a journal is received check journal ordered master
2. Generate details of journal received (journal identity, name, volume, issue no, month) and send details to Process 2.

Process 2:

1. Enter journal received detail in journal received file
2. Print list of journals received during a week
3. Check list of journals expected with the journals received file. Send the list of journals expected and not received to process 3
4. When all issues of journal expected during the year have been received, send the information to journal binding section of the library

Process 3:

1. Using the journals not received list, generate reminders to the publishers and request replacement

Process 4:

1. In September, October and November check whether an invoice is received from the publisher for journal due for renewal in that month. If not, send request for invoice to the publisher.
2. When an invoice is received from the publisher, generate an indent to be sent to the purchase section

Process 5:

1. When payment details with invoice copy are received from accounts, update entry in journal master file, enter payment information in payment detail file and mail payment detail with a copy of invoice to the publisher

The structured English description of each process is given below:

Procedure for process1

for each journal received **do**
  Enter journal identification code, volume and issue no.
if journal is in ordered file **then**
  Retrieve journal details from master file and send details to Process2;
else
  Give message "Journal not in master. Check identification code entered";
end for

Procedure for process2

for each journal received transaction sent by process1 **do**
  Enter journal received file;
  Print journal received in weekly list;
end for
  Send list of journals received during week to the library.
  At the end of each month
    for each journal expected during the month **do**
     Search in journal received file;
     if not in file then send journal identification, volume no, and
     not received transaction to process 3;
    end for
At year end
    for each journal in journal received file **do**
     if all issues of volume received
     then print journal details in binding list
    end for
Send list to library

Procedure for process3

for each journal received note from process2 **do**
 using journal identification find publisher details from Journal-publisher master file;
 print letter requesting replacement to publisher;
end for

Procedure for process4

At the end the month
for each invoice received from the publisher **do**
  Search journal master file to find journal details;
  Search publisher master file to find publisher details;
  Generate indent and send to purchase section;
  Enter journal ordered information in journal master file;
end for

Procedure for process5

for each payment detail received from accounts section with invoice copy **do**
 Enter payment details in payment detail file;
 Enter paid information in Journal master file;
 Send payment details with invoice to publisher;
end for

DATABASE DESIGN

(i)   Data about journals: Journals id, Journal code (ISSN), journal name, vol no, periodicity, parts per number, subject code, language, publisher identification, time allowed for delivery, year of first issue ordered renewed upto year.

(ii)   Data about subscription details : Journal identification, date of invoice to be sent, yearly subscription, currency of subscription, date when subscription sent, subscriber code, amount in rupees, subscription amount in foreign country, invoice no, order no, draft no, draft date, bank name

(iii)   Data about publisher/agent supplying journal: Publisher identification, Publisher's name, address, agent or publisher.

The entity-relationship diagram for the application is shown below:
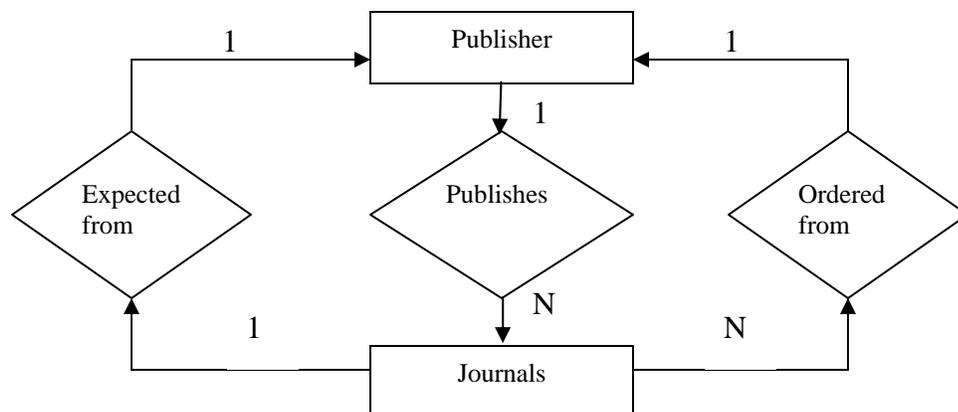
The publisher-journal relationship is one-to-many.
The normalized relations are given below.

Journal: *Journal id*, journal name, journal ISSN, subject code, language, key words, number per volume, parts per volume, month of first number, year first ordered, renewed upto year.

Publisher/Agent: *Publisher id*, publisher's name, address, agent or publisher, publisher type.

Journal-publisher relation: *Journal-id, publisher id*

Journals Expected: *Journal-id, vol, no*, first no, month, periodicity, expected delay.

Journals received: *Journal-id, vol*, no of issues in vol, no of issues received, last issue no received.

Journal payment details: *Journal id, vol*, order no, order date, publisher's invoice no, invoice date, foreign currency amount, rupee amount, draft no, draft date, bank no.

The relations needed by each process in the DFD:

Process	Relations to be read	Relations to be written
1.	Journal expected	
2.	Journal Journal expected	Journal received
3.	Journal-publisher Publisher	
4.	Journal-publisher Publisher Journal	
5.	Journal-publisher Journal	Journal payment details

(iv)   Data encoding: All journals have a standard international code known as ISSN that can be used. In our design a simple serial number is used as a code to reduce data entry. In this case this is acceptable as the number of journals is quite small.

MENUS FOR DATA INPUT

MAIN MENU

AUTOMATED SERIALS CONTROL SYSTEM LIBRARY "XYZ"

A> ORDER PROCESSING
B> JOURNAL MAINTENANCE
C> SUPPLIER MASTER MAINTENANCE
D> QUERY
E> EXIT
ENTER YOUR OPTION

MENU A : ORDER PROCESSING

1. ADD/DELETE JOURNAL
2. REQUEST FOR INVOICE OR REMAINDER
3. INPUT INVOICE
4. PRINT INDENT LIST
5. ENTER PAYMENT DETAILS
6. PRINT PAYMENT DETAILS
7. EXIT
ENTER YOUR OPTION

MENU B: JOURNAL MAINTEINANCE

1. UPDATE JOURNAL INFORMATION
2. ENTER JOURNAL RECEIVED DETAILS
3. PRINT REMINDERS
4. EXIT
ENTER OPTION AND PRESS RETURN

MENU C: MAINTAINING PUBLISHER MASTER
1. ADD PUBLISHER NAME
2. DELETE PUBLISHER NAME
3. MODIFY PUBLISHER DETAILS
4. EXIT
ENTER OPTION AND PRESS RETURN

MENU D: ENQUIRY OR PRINTING

ENQUIRY   PRINT OPTION

DISPLAY
A. RECEIVED JOURNALS   1 LIST JOURNALS YEARWISE
B. LIST OF JOURNALS BY KEYWORD 2 LIST JOURNALS ALPHABETICALLY
                                               3 LIST NEW JOURNALS
                                               4 LIST JOURNALS BY LANGUAGE
                                               5 LIST JOURNALS BY KEYWORD
                                               6 LIST JOURNALS BY SUBJECT
                                               7 PUBLISHER LIST
                                               8 MAILING LIST
                                               9 BINDING LIST

ENTER YOUR OPTION AND PRESS Esc

CONTROL, AUDIT AND TEST PLAN

Control plan
1. Check whether duplicate copies of an issue of a journal have been received
2. Check whether invoice amount and order amount match
3. Check on Nov 30 whether total number of periodicals for which renewal subscriptions sent equals number of titles in the subscription list

Audit plan
1. Compare total order amount with total payment amount (draft volumes)
2. Check that no duplicate renewals here been sent when duplicate invoices from publisher is received.

Test plan:
1. Enter a wrong journal code and see the response
2. Enter a correct journal code and see the response
3. Enter a wrong journal volume and see the response
4. Enter a few journal codes expected in a month and see the response
5. Create a journal not received transaction and see the result of processing
6. Try giving year end message and see the effect
7. Create payment details transaction and enter to see the effect
8. The input screens must have prompts and messages if incorrect data is entered.

IMPLEMENTATION PLAN

1. Codify journals being subscribed
2. Create a master database of journals with details
3. Codify publishers and agents who supply journals
4. Create a master database of publishers with addresses
5. Create journal id, publisher id, database
6. Based on knowledge of delays in delivery, enter in journal expected relation the expected delay
7. Create a sample set of weekly, monthly and year-end transaction
8. Create transactions corresponding to receiving draft from accounts for subscription payment.
9. Design screens for data input and query answering
10. Test each process using sample data
11. Integrate all processes and databases
12. Create user manuals
13. Create system manuals
14. Design user's feedback forms and system review plan

      (i)   System's manual: A one page instruction is prepared on how to use the system. As the system is interactive with screens and prompts, no extensive user manual is needed

      (ii)   User's feedback form: This form should be designed to obtain user's opinion on ease of use, ease of data input, quality of screens and system response time

      (iii)   Review plan: The system is to be reviewed at the end of one year.