Chapter 4

Methodology of the Study

This chapter presented the methods and procedures on how the research project is to be done. It includes discussion on research method and techniques, systems development methodology, requirements analysis, requirement documentation, design of software, development and testing, implementation plan and implementation results.

Research Methods and Techniques

Descriptive-Qualitative method is gathered from a variety of sources by using different method such as interviews and observations. This method often involves simply interviewing and observing to collect more data. Observation is a systematic data collection approach. The interview in this method is a conversation where questions are asked to get the information needed. Such study is especially useful for researchers wanting to know the who, what, and where of the events.

The proponents conducted descriptive qualitative methods to collect as much data to capture all the procedures in the event. This method can gather all information's that the researchers need to be inserted in the proposed system. It helps the researchers to know the processes and policies inside the library of Immaculate Conception I-College of Arts and Technology.

Data Gathering Instruments

The proponents used the following techniques in gathering data:

Interview. During the requirements gathering stage, the proponents conduct face – to – face interview with the librarian and assistant librarian of Immaculate Conception I-College of Arts and Technology who gave the resources about the flow of the existing system of the library.

Observation. The proponents have some inspection regarding the existing system of the library to gather more ideas on how to develop the proposed system. From this observation, the proponents noted some problems being countered and this problem use to enhance the process of the library.

Internet research. The proponents also conducted this to gather more data and topics that are related to the study. The data gather gives the proponents an idea for the topics they use.

The library research. The proponents also used library materials like thesis documentation and books that are related to the study in gathering significant information and validation.

Systems Development Process

Adaptive Software Development is part of Agile Model that embodies the principle that continuous adaptation of the process to the work at hand. The proponents used Adaptive Software Development because it helps the proponents to have a better process

for the development of the system. This model promotes continuous iteration of development and testing throughout the software development lifecycle of the project.

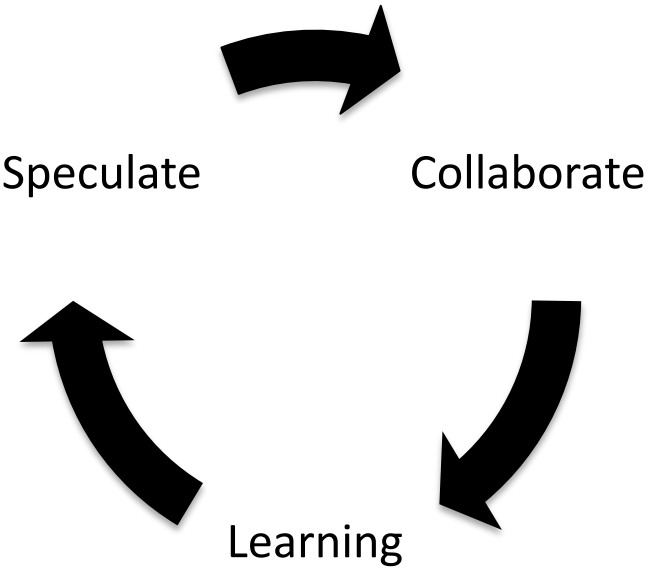

Figure 1.Adaptive Software Development

Speculate. This cycle uses project initiation information – the customer's mission statement project constraints (e.g., delivery dates or user descriptions), and basic requirements – to define the set of release cycles that will be required for the project. The proponents involved with creating of plans to have a proper guide throughout the development of the system. This cycle helps the proponents to manage time, cost quality, and scope of developing the system.

Collaborate. In this cycle, the proponents are referring the effort for balancing the work based on predictable parts of the environments (planning and guiding them) and

adapting to the uncertain surrounding mix of changes caused by various factors, such as technology, requirements, stakeholders, and software vendors. This cycle helps the researcher to adapt the changes while developing the system.

Learning. In this cycle, the system is created physically and the production system is installed. This system is based on short iterations with design, build and testing. During the deliver it is reviewed to ensure that the researchers met the goals in the project plan for a satisfactory result. In the same time, while designing, building and testing the system there is the problems that the proponents are encountered. The proponents used the problem to solved and careful to not happen again the said problem. That will be the lesson for the proponents to fixed and avoid the problem.

Requirements Analysis

The existing system of ICI Library is manually done. The proponents construct idea in developing new system based on the gathered data, problems that will find solution for the existing library system. The proponents reviewed well all the necessary requirements to meet the desired idea for the new system to be developing.

Economic feasibility. The purpose of the economic feasibility assessment is to determine the positive economic benefits to the organization that the proposed system will provide. It includes quantification and identification.

Operation cost. Operating costs are the expenses which are related to the operation of a business, or the operation of a device, component, and pieces of equipment or facility. They are the cost of resources used by an organization just to maintain its existence.

Table 4.

Operating Cost (Existing System)

	Item	Monthly	Annually
A.	**Personnel**		
	(1) Librarian @15,000.00	15,000.00	180,000.00
	(2) Assistant librarian @12,000.00	12,000.00	144,000.00
	Total Personnel Cost	**27,000.00**	**324,000.00**
B.	**Supplies**		
	(1) Log book @ 30.00	30.00	360.00
	(5) Ball pen @ 10.00	50.00	600.00
	(2) Box paper clip @19.75		39.50
	(2) Small box staple wire @ 20.00	40.00	459.00
	(1)Ream bond paper @160.00		160.00
	(4) Ruler @5.00		20.00
	(5) Folder S @8.00	40.00	480.00
	(5) Folder L @ 10.00	50.00	600.00
	(1) Box fastener @30.00		30.00
	Total Supplies Cost	**210.00**	**2,748.50**
C.	**Equipment**		
	(2)Medium Stapler @75.00		150.00
	(1) Printer @6,525.00 Salvage value: 6,525.00*.2 = 1,305.00 Description value: 6,525.00 - 1,305.00 = **5,220.00/yr**		5,220.00
	Total Equipment Cost		**5,370.00**
	Summary		
	A. Personnel		324,000.00
	B. Supplies		2,748.50
	C. Equipment		5,370.00
	Total Annual Cost (Existing System)		**332,118.50**

Table 5.

Operating Cost (Proposed System)

	Item	Monthly	Annually
A.	**Personnel**		
	(1) Librarian @15,000.00	15,000.00	180,000.00
	Total Personnel Cost	**15,000.00**	**180,000.00**
B.	**Supplies**		
	(3) Ball pen @10.00	30.00	360.00
	(3) Folder S @8.00	24.00	288.00
	(3) Folder L @ 10.00	30.00	360.00
	(1)Ream bond paper @160.00		160.00
	(2) two small box staple wire @ 20.00	40.00	459.00
	Total Supplies Cost	**124.00**	**1,627.00**
C.	**Equipment**		
	(1)Medium Stapler @75.00		75.00
	(1)Printer @6,525.00		
	Salvage value: 6,525.00*.2 = 1,305.00		5,220.00
	Description value: 6,525.00 – 1,305.00 = **5,220.00/yr**		
	(1)Router @ 1,290.00		1,032.00
	Salvage value: 1,290.00*.2 = 258.00		
	Description value: 1,290.00 - 258.00 = **1,032.00/yr**		
	Total Equipment Cost		**6, 327.00**
	Summary		
	a. Personnel		180,000.00
	b. Supplies		1,627.00
	c. Equipment		6,327.00
	Total Annual Cost (Proposed System)		**187,954.00**

Cost benefits analysis. Is a technique designed to determine the feasibility of a project by quantifying its cost and benefits.

Table 6.

Cost and Benefits Analysis

Existing System Cost	332,118.50
Proposed System Cost	187,954.00
Annual Cost Saving	**144,164.50**

Development cost. Is the total of all costs incurred from initiations to implementation of a project, it includes the software, hardware requirements, labor cost, supplies cost, electric consumption, food and transportation cost.

Table 7.

Development Cost

	Item	Amount
A.	**Hardware Cost**	
	(1)Computer set @17,000.00	17,000.00
	AOC LED Monitor 12 inch 5,000.00	
	AVR 300.00	
	Del Keyboard 800.00	
	Del Mouse 600.00	
	Desktop 10,300.00	
	Desktop specs	
	Hard Disk Sea Gate 500GB	
	Kingston RAM 2x2GB	
	MSI Motherboard A68HM-E33V2	
	Processor AMD A6 3.9Ghz	
	Video card NVIDIA GT 730 2GB 128bit	
	Window System Type = MS Windows 7 64-bit	
	(1)Router @1,800.00	1,800.00
	Total Hardware Cost	**18,800.00**
B.	**Software Cost**	
	SMS Gateway @300.00(2 months)	600.00
	Total Software Cost	**600.00**
C.	**Labor Cost**	
	(1) Programmer 15,000 per Month (5 months)	75,000.00
	Total Labor Cost	**75,000.00**

D.	**Supplies Cost**	
	(4) Ball pen @8.00	32.00
	(1) DVD R @15.00	15.00
	Xerox/print service fee	2,000.00
	Tarpaulin	180.00
	Total Supplies Cost	**2,227.00**
E.	**Electric Consumption Cost**	
	Computer @1,527.40	1,527.40
	Electric fan @327.30	327.30
	Florescent @130.92	130.92
	Router @196.00	196.00
	Total Electric Consumption Cost	**2,181.62**
F.	**Food and Transportation Cost**	**2,000.00**
	Summary	
	A. Hardware Cost	18,800.00
	B. Software Cost	600.00
	C. Labor Cost	75,000.00
	D. Supplies Cost	2,227.00
	E. Electric Consumption Cost	2,181.62
	F. Food and Transportation Cost	2,000.00
	Total Development Cost	**100,808.62**

Table 8.

Systems Development Cost

Proposed System Cost	187,954.00
Development Cost	100,808.62
Total Systems Development Cost	**288,762.62**

Operational feasibility. Is a measure of how well a proposed system solves the problems, and take advantage of the opportunities identified during scope definition and how it satisfied in the requirements analysis phase of system development.

Fishbone diagram. Also called a cause and effect diagram or Ishikawa diagram, is a visualization tool for categorizing the potential causes of a problem in order to identify its root causes. The proponents show all the possible reasons of project failure while developing a system.

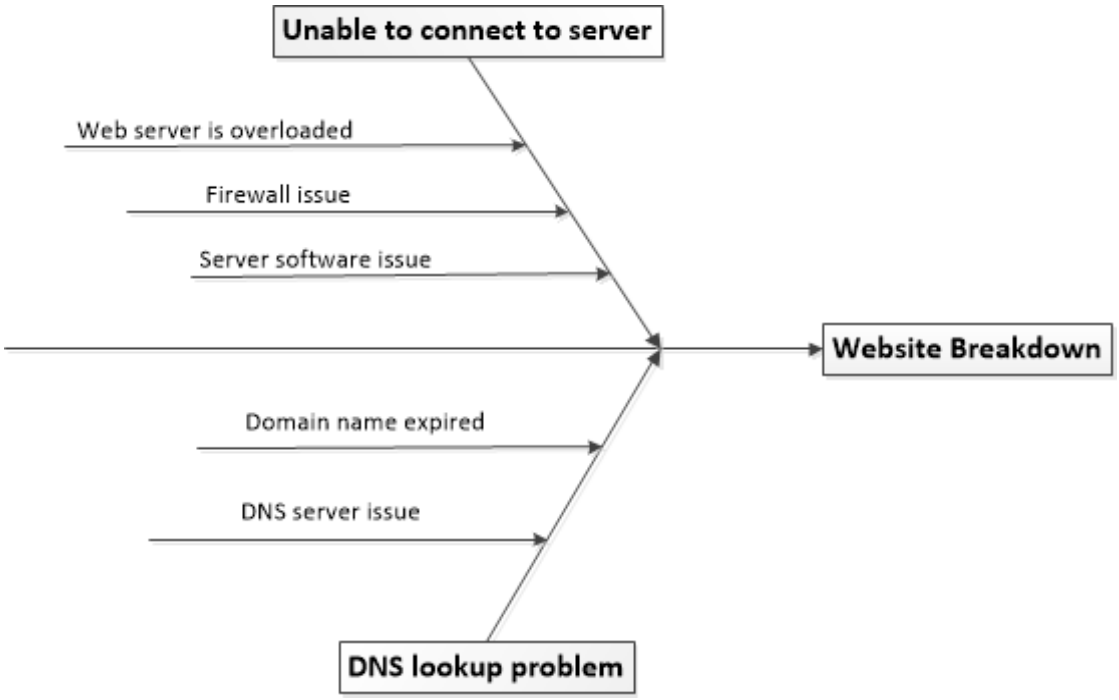

Figure 2.Fishbone Diagram

Schedule feasibility. Is defined as the probability of a project to be completed within its scheduled time limits, by a planned due date.

Gantt chart. A Gantt chart is a graphical depiction of a project schedule. A Gantt chart is a type of bar chart that shows the start and finish dates of several elements of a project that include resources, milestones, tasks and dependencies. Henry Gantt, an American mechanical engineer, designed the Gantt chart.

The proponents used Gant Chart to monitor the schedule of the project for the tasks that is given. This schedule helps the proponents in planning a project and defining the sequence of tasks that require completion.

Activity	Oct-16				Nov-16				Dec-16				Jan-17				Feb-17			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Capstone Proposal Planning																				
Planning for Software Deployment																				
1st Interview																				
Chapter 1																				
Introduction																				
Project Context																				
Purpose and Description of the Project																				
Descriptive of the Project																				
Scope and Limitations																				
Significance of the Study																				
Prototype																				
Revision of Chapter 1																				
Chapter 2																				
Theoretical Background																				
Related Literature																				
Related Studies																				
System Development																				
System Planning																				
System Design																				
Database																				
Front end Design																				
Code for Log-in																				
Chapter 3																				
Technicality of the Project																				
Details Technology to be used																				
How the Project will work?																				
Chapter 4 - 5																				
Environment																				
Documentation																				
Requirement Specification																				
Operation Feasibility																				
Schedule Feasibility																				
Economic Feasibility																				
Requirement Modeling																				
Data and Process Modeling																				
Object Modeling																				
Data Design																				
Development																				

Figure 3.Gantt Chart of Activities

Requirements Documentation

This section presents the initial design of the system by discussing its major components and their interaction.

Data and process modeling. Systems analyst use many graphical techniques to describe an information system. A Data Flow Diagram (DFD) uses various symbols to show how the system transforms input data into useful information.

Data flow diagram. Shows how data moves through an information system but does not show program logic or processing steps. It provides a logical model that shows what the system does, not how it does.

*Data flow diagram level 0 or context diagram.*It's a basic overview of the whole system or process being analyzed or modeled.

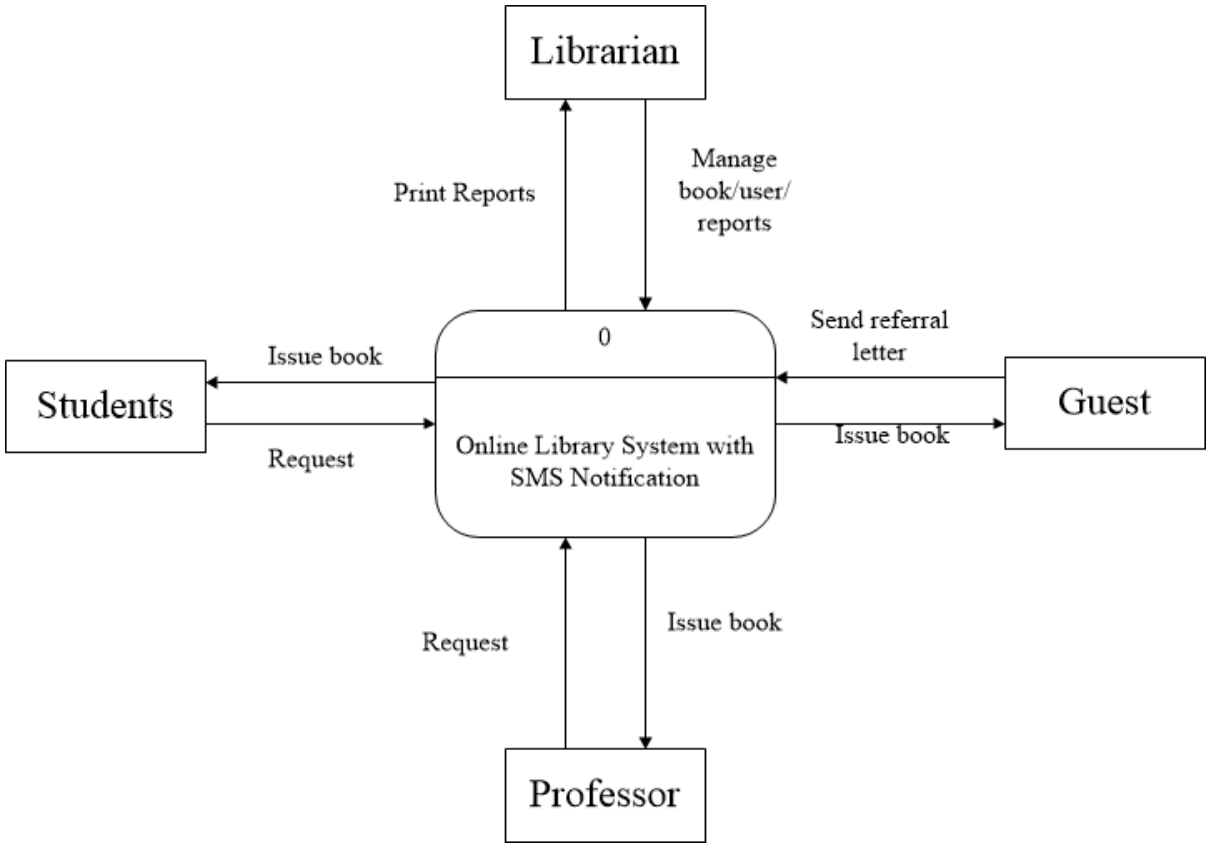

Figure 4. Data Flow Diagram (Level 0 or Context Diagram)

*Data flow diagram level 1.*Provides a more detailed breakout of pieces of the Context Level Diagram. You will highlight the main functions carried out by the system, as you break down the high-level process of the Context Diagram into its sub processes.

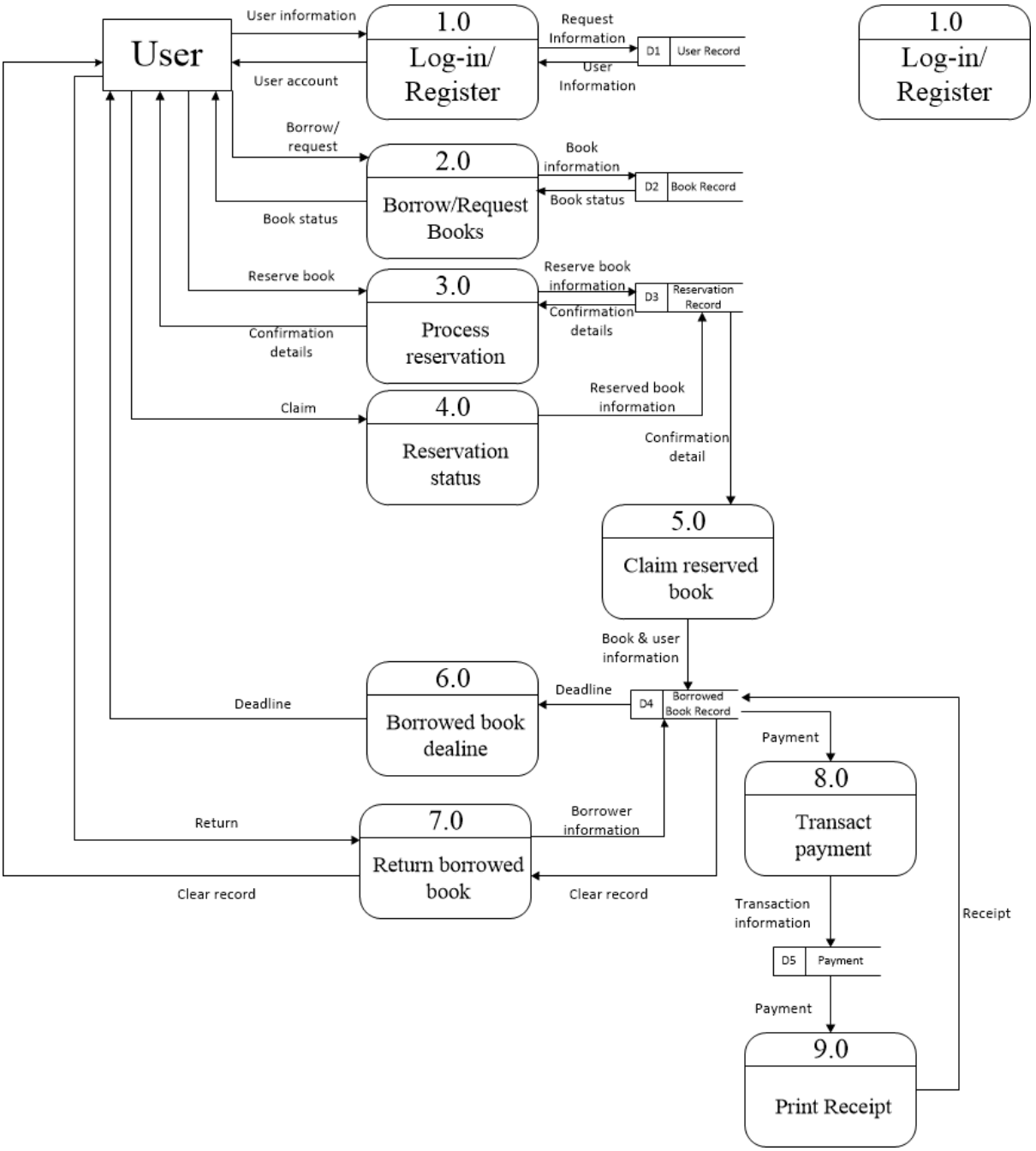

Figure 5.Data Flow Diagram (Level 1)

*Data flow diagram level 2.*Goes one step deeper into parts of Level 1. It may require more text to reach the necessary level of detail about the system's functioning.

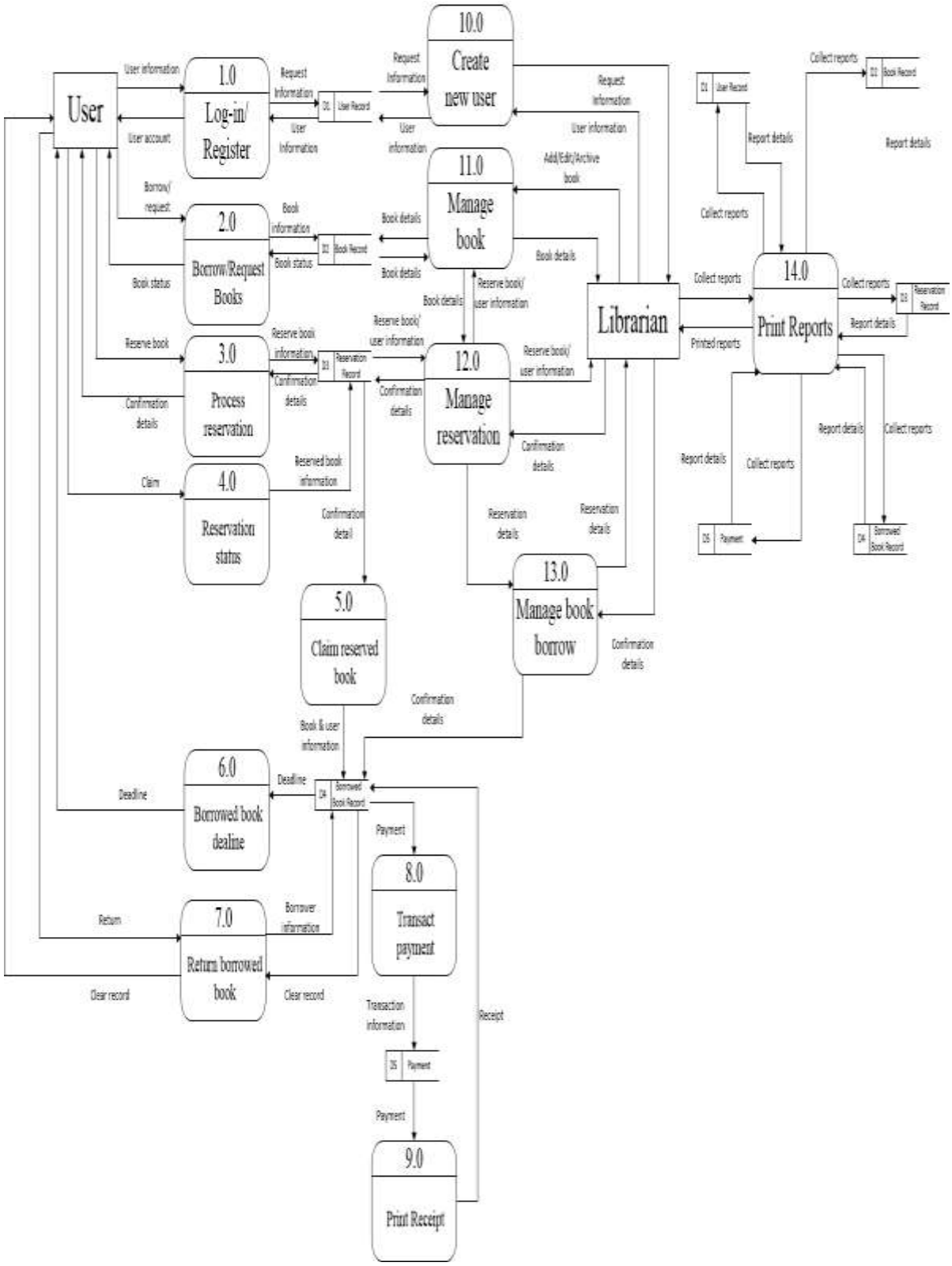

Figure 6. Data Flow Diagram (Level 2)

System flow chart. This diagrammatic representation illustrates a solution model to a given problem. Flowcharts are used in analyzing, designing, documenting or managing a process or program in various fields.

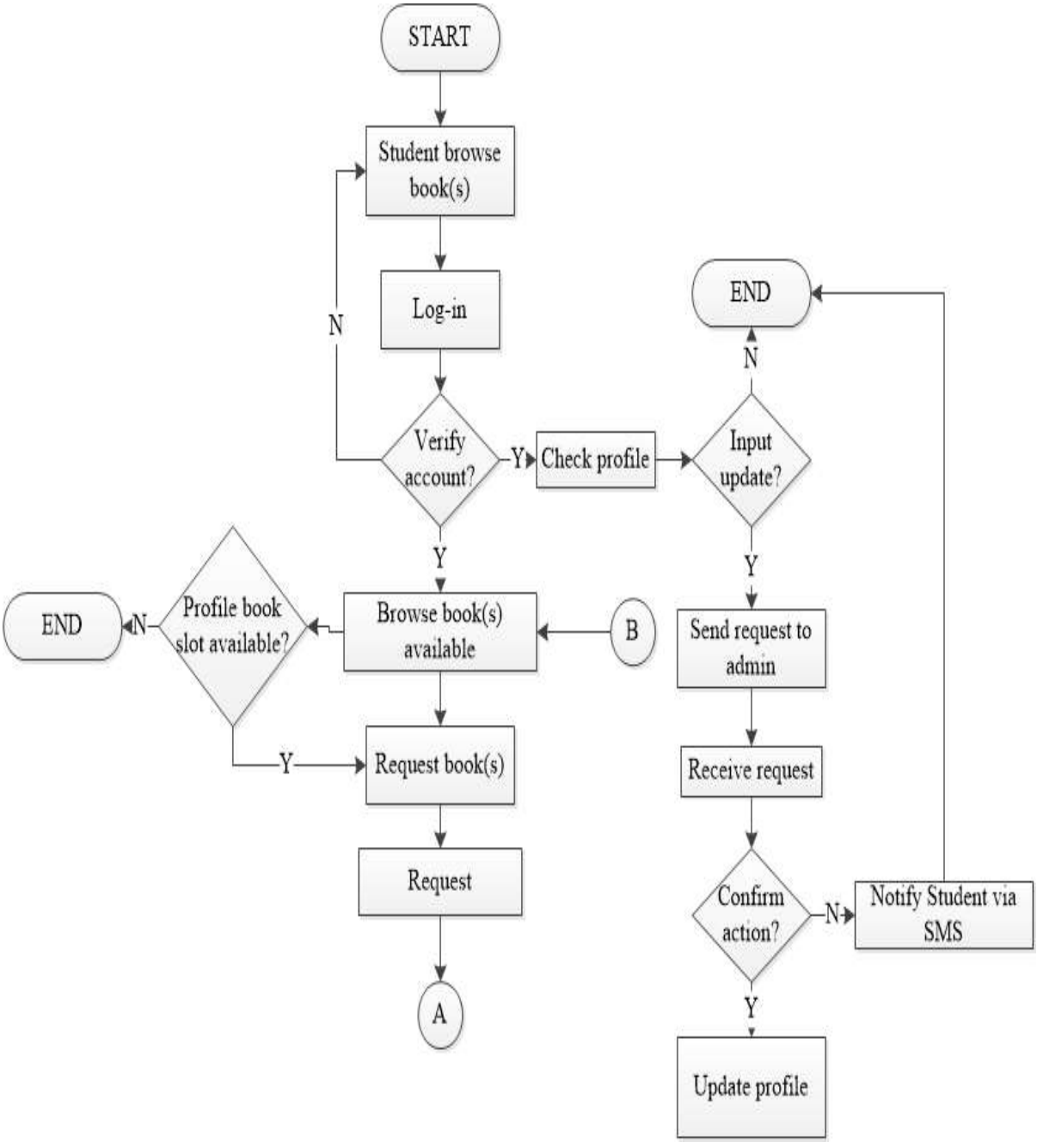

Figure 7.Student System Flow Chart

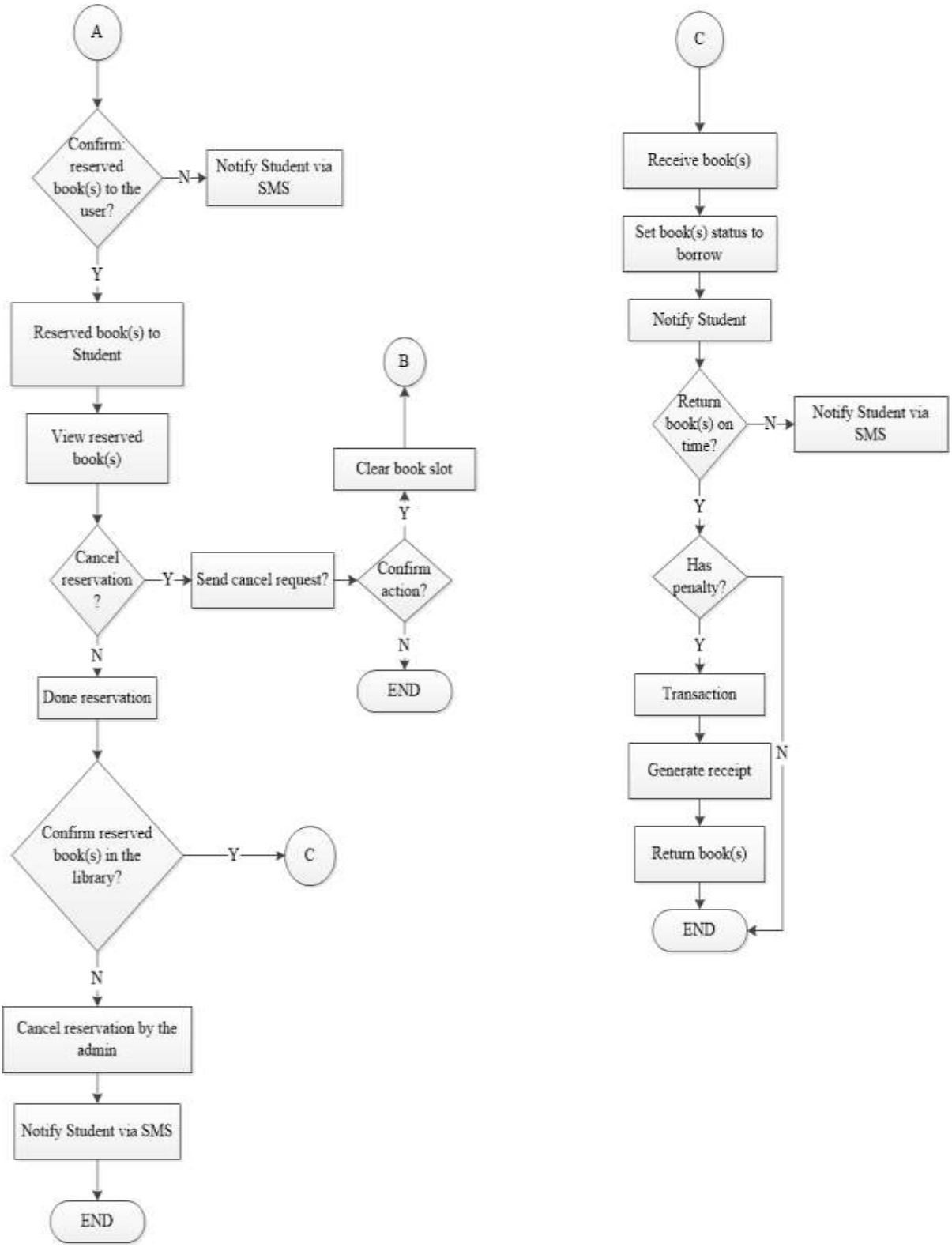

Figure 8.Student System Flow Chart (continuation)

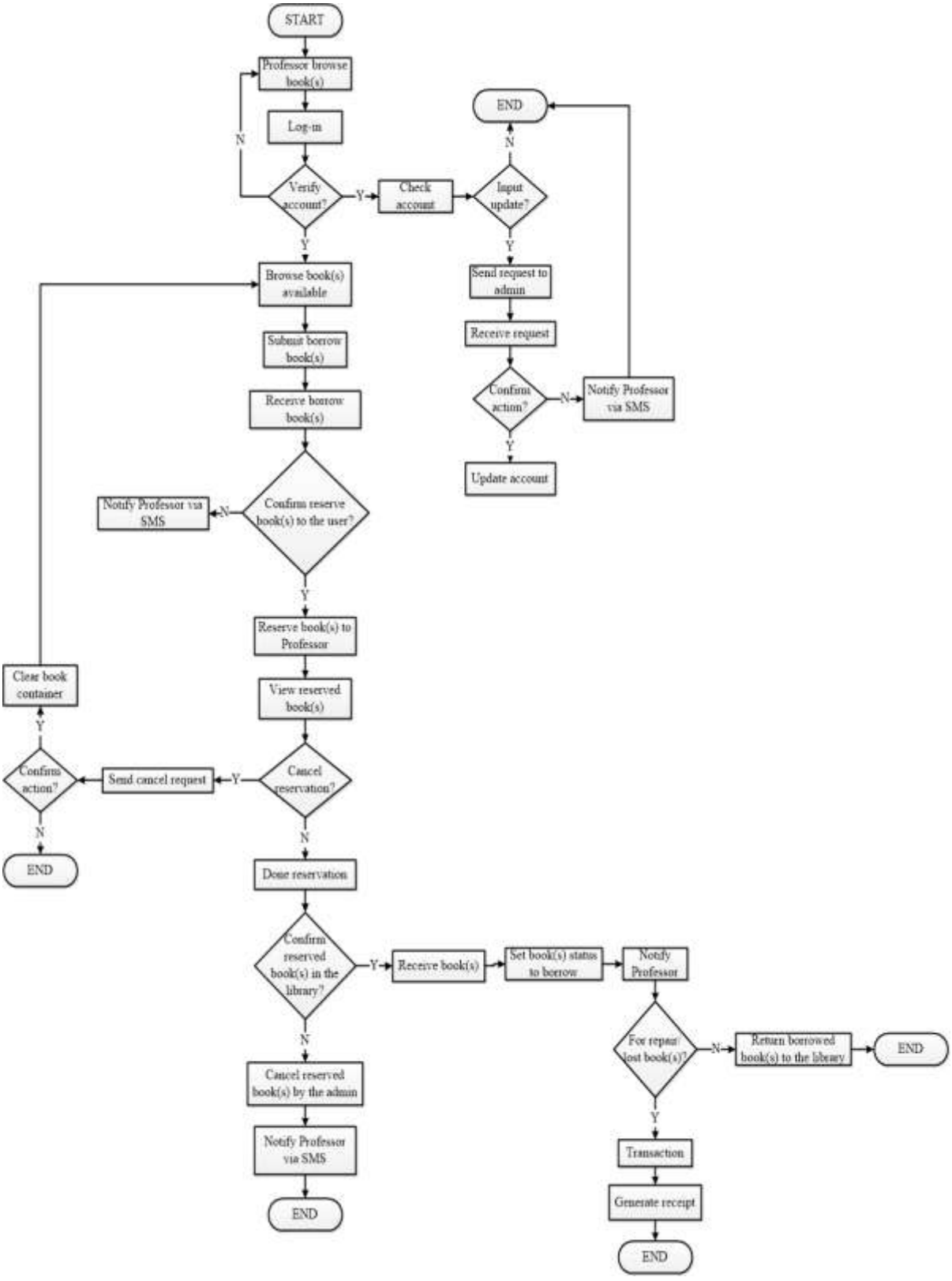

Figure9.Professor System Flow Chart

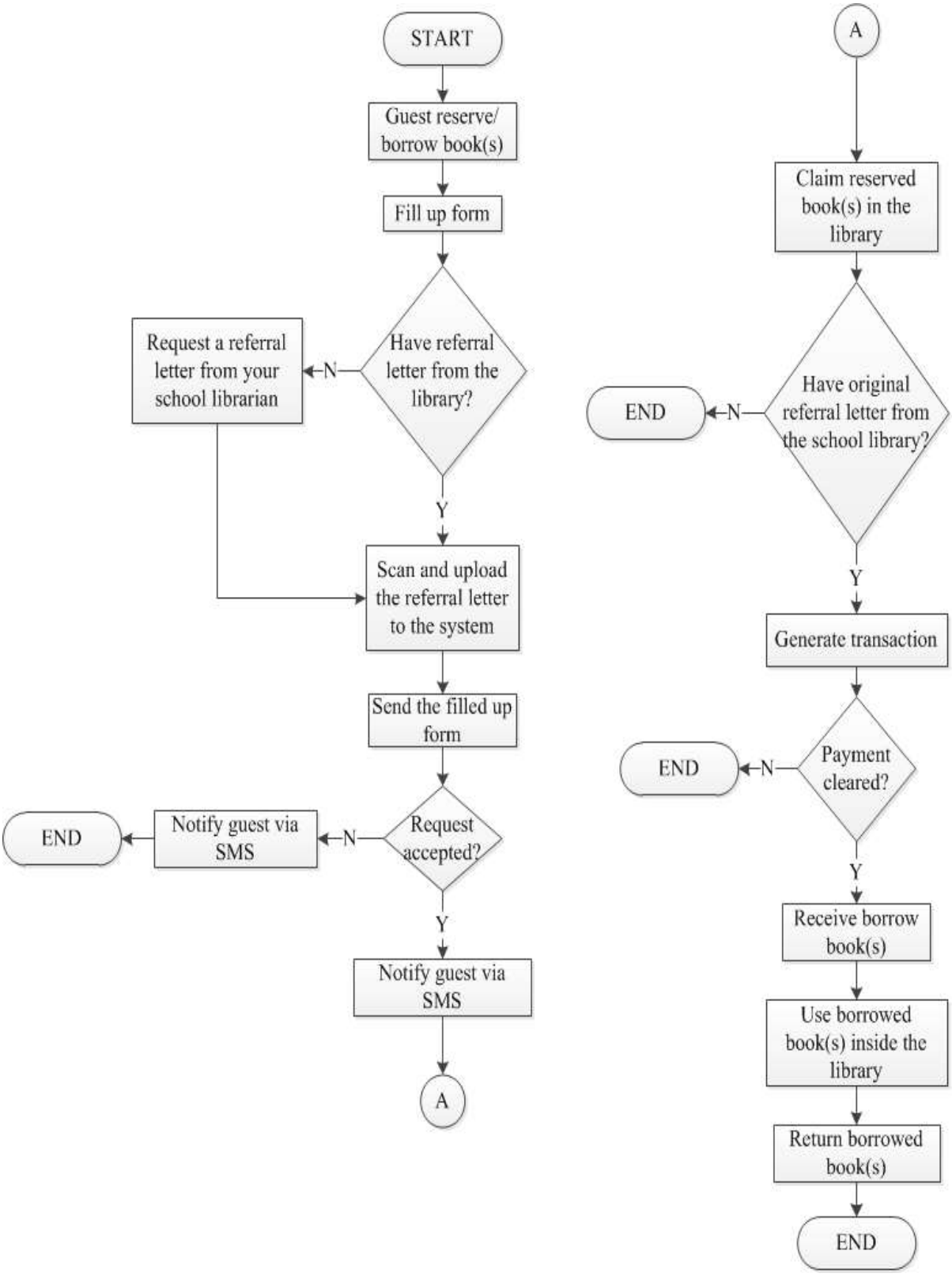

Figure 10.Guest System Flow Chart

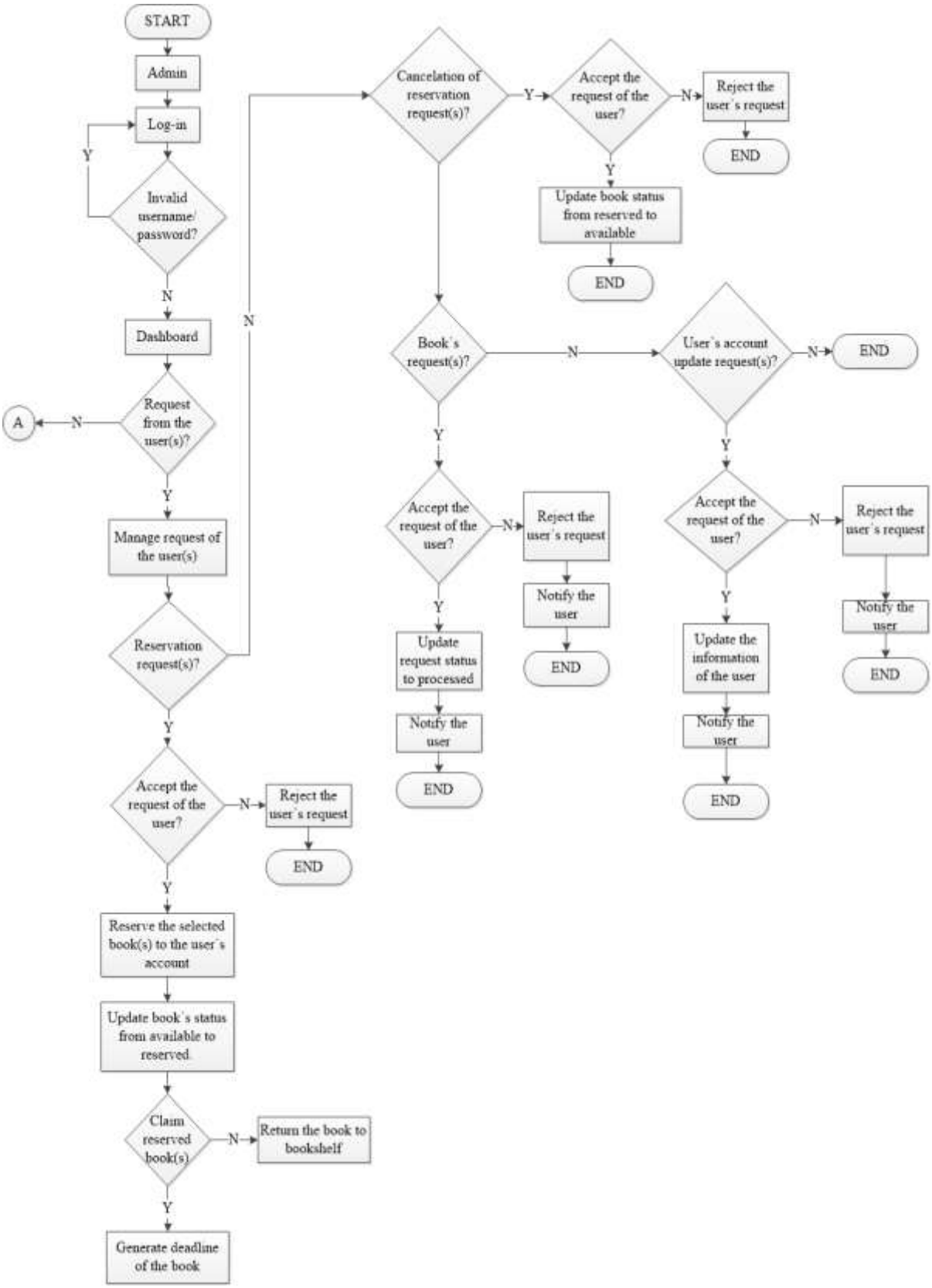

Figure 11.Admininistrator System Flow Chart

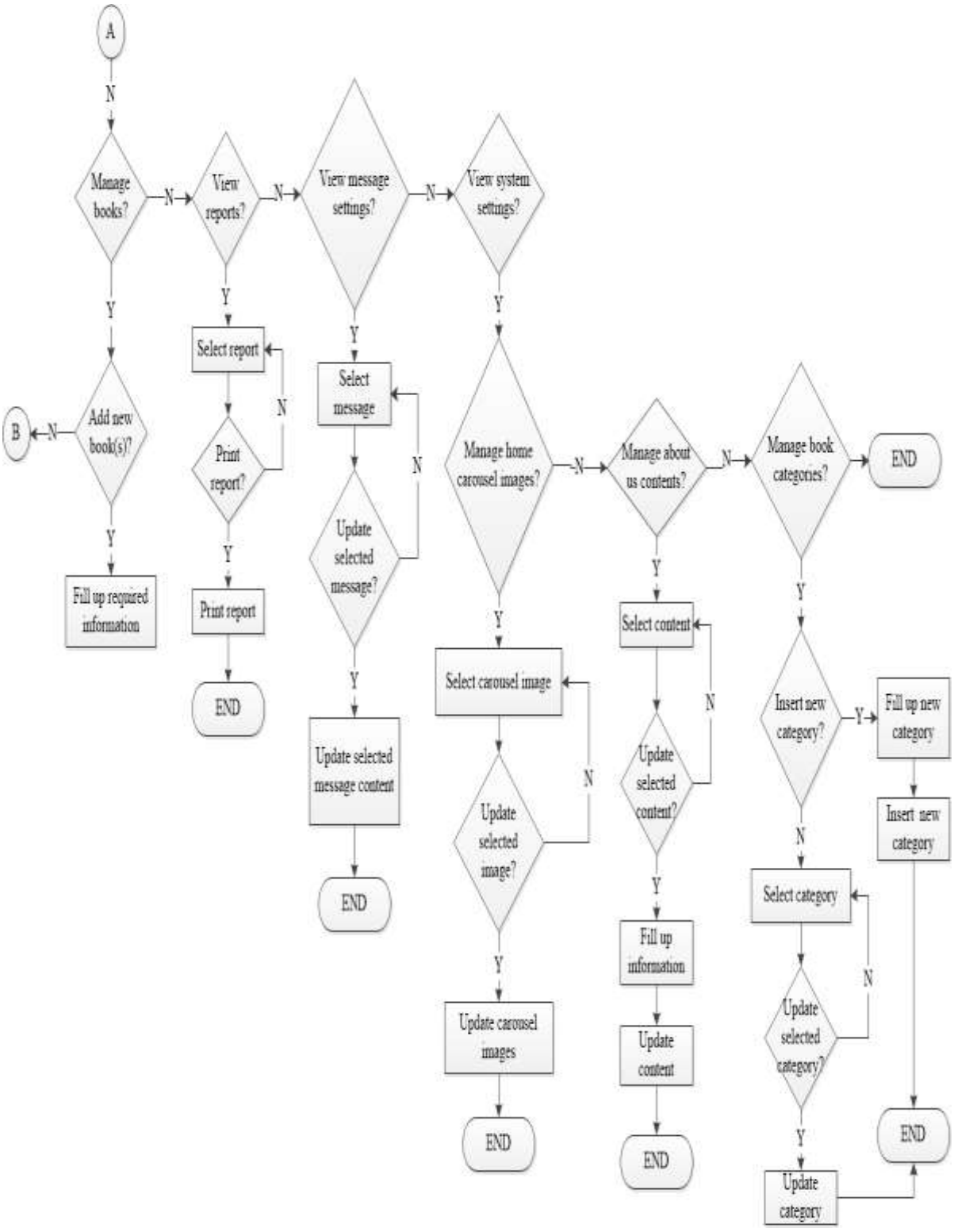

Figure 12. Administrator System Flow Chart (continuation)

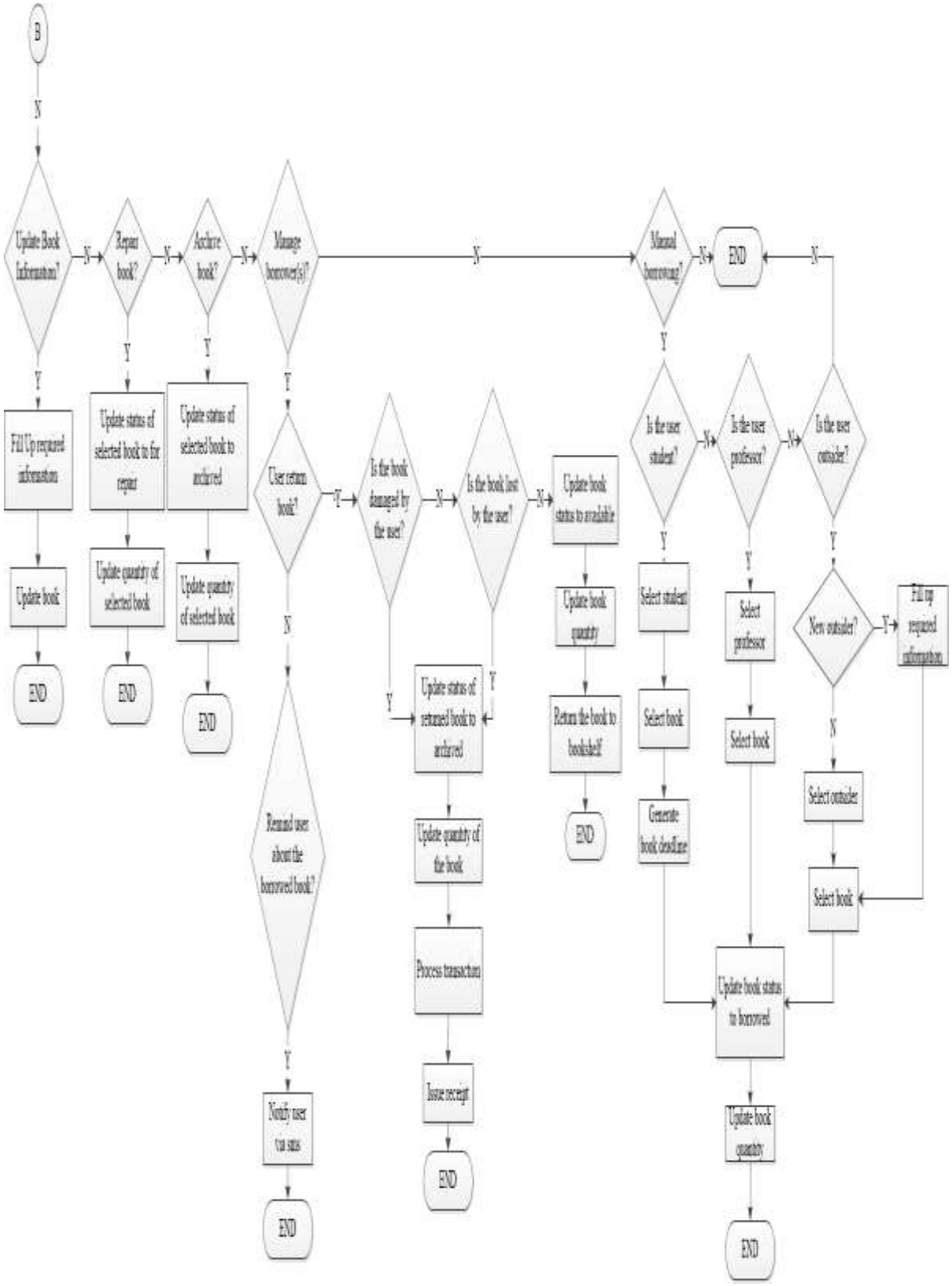

Figure 13. Administrator System Flow Chart (continuation)

Object modeling. Approach for software modeling and designing. It is a method to develop object-oriented system and to support object-oriented programming. It was developed as an approach to software development.

Use case diagram. Is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved.

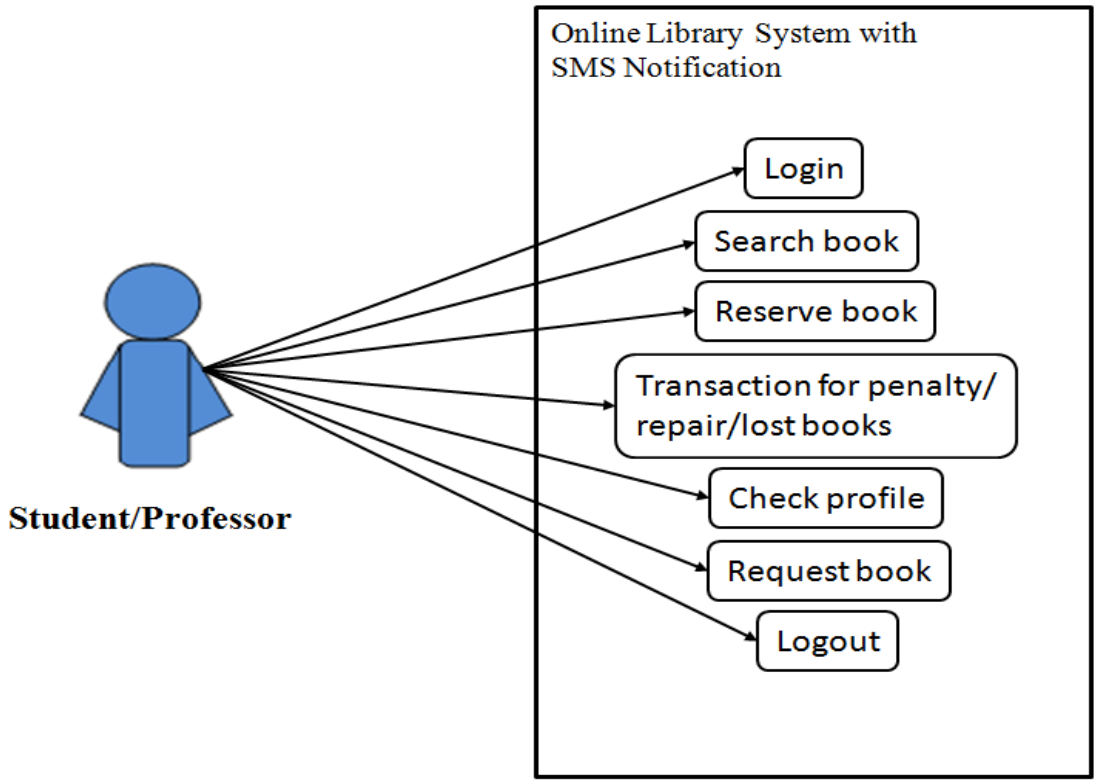

Figure 14.The System's Use Case Diagram for Student

Figure 14 illustrates and elaborated system flow of the user's account. If the user's account is logged on, the user homepage will prompt. The user can search, borrow, and reserved books through this system. The user can also check his/her profile if they have

penalty or they have no slot for the reservation of the books they want to borrow. The user can free for feedback.

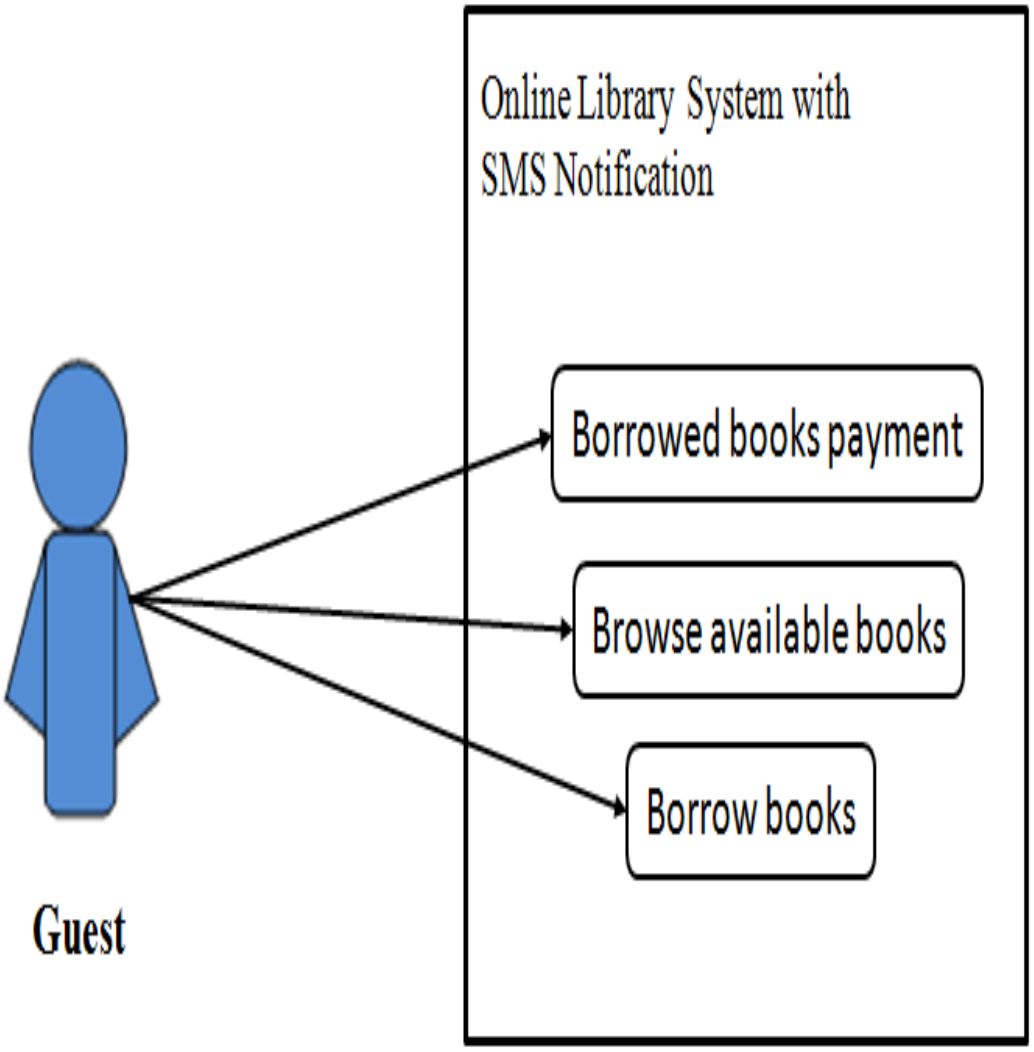

Figure 15. The System's Use Case Diagram for Guest

Figure 15 illustrates an elaborated system flow for the guest account. This figure provides form options for available books, borrow books, and transact payment. The guest can only see the available books in the home of the website. They can reserve books by fill up the form for the outsider only. The guest can also transact payment to the library before

they borrow the book they reserve online. They only used the books they borrow inside the library. They are not allowed to get the book outside the library.

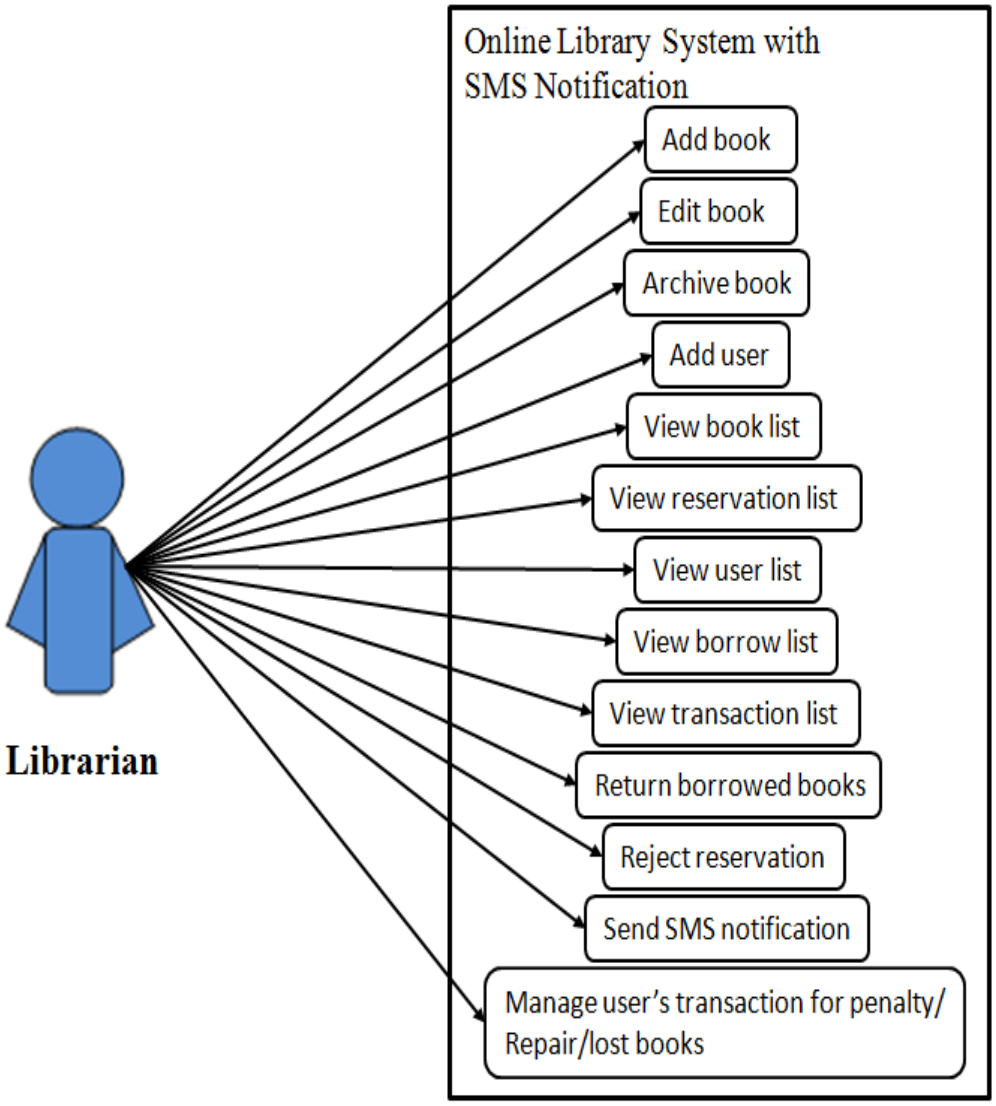

Figure 16.The System's Use Case Diagram for Librarian

Figure 16 illustrates an elaborated system flow for the librarian account. This figure provides form options to add, edit, or delete books, and accept or delete the reservation of the student. The librarian can view the list of the books, reservation, user, borrowed books, and transaction. If the librarian account is logged on, the user can see the number of

request, books, and students. The form provides option on accessing the users, the items, the transactions, the requests, the reports, and sending message.

The user form provides options to view the list of users, to create user and to view the profile of the admin. Changes will be updated to the list of the user when the librarian create new user.

The items form provides options to view the books and other school items. Inside the book form are the lists of the books, archived book, the holder's of the book, waiting to be claimed book, and add new book. Changes will be updated in the book form.

The transaction form provides options to view the list of the transaction and the list of penalty payment. The librarian can take an action when the users pay the penalty. Changes will be updated in the list of the transaction and penalty payment.

The request form provides options to view the list of the borrow request, cancelation request, book request, account request, and account update request. The action will take when the librarian confirm or reject the book request, the cancelation request, the account request, or the account update request. Changes will be updated to the account of the user.

The message form provides option when the user will have to notify for the responsibility for the books. The librarian notify the user through SMS if the borrowed books are about to expire. The reports form provides options to book list report, borrowed books report, user list report, and transaction report. All the changes will be updated in the reports.

Design of Software

This section discusses the design and implementation of the data structures and algorithms used in the software. It included a discussion on the major issues and problems encountered, and the corresponding solutions and alternatives employed by proponent. Part of the design tools in the technical manual may be lifted as figures in this section.

Data design. Is a process of producing a detailed data model of database. This data model contains all the needed logical and physical design choices and physical storage parameters needed to generate a design in a data definition language, which can then be used to create a database.

Entity relationship diagram. Is a data modeling technique that graphically illustrates an information system's entities and the relationships between those entities.

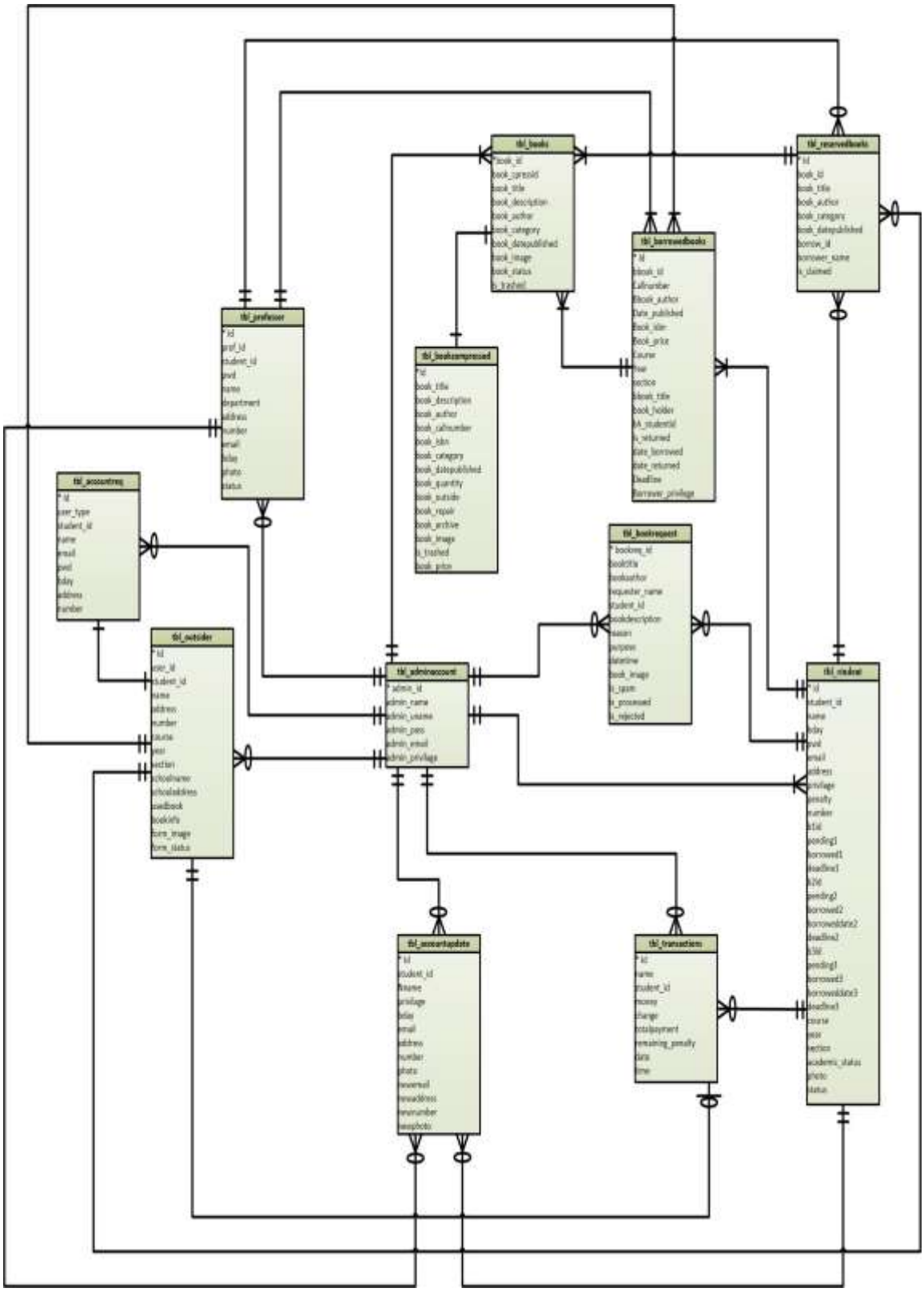

Figure 17. Entity Relationship Diagram

Data dictionary. Defines the structure of the database itself and is used in control and maintenance of large databases. It helps various users to know all the objects which exists in database.

Table 9.

Data Dictionary – tbl_accountupdate

Column	Type	Comment
Id	int(11) *Auto Increment*	Unique ID of the current table
student_id	varchar(255)	ID number of the person which is displayed on a person's school ID
Name	varchar(255)	Fullname of the person
Privilege	varchar(255)	User level of the user
Bday	varchar(255)	Date of birth of the person
Email	varchar(255)	Email address of the person
Address	varchar(255)	Current home address of the person
Number	varchar(255)	Active mobile number of the person which will be used by the system for notification features
Photo	varchar(255)	Actual image of the person for additional identification
Newemail	varchar(255)	An Updated email address of the person
Newaddress	varchar(255)	An updated home address of the person
Newnumber	varchar(255)	A new mobile number of the person
Newphoto	varchar(255)	An updated image of the person

Table 10.

Data Dictionary – tbl_adminaccount

Column	Type	Comment
admin_id	int(10) unsigned *Auto Increment*	Unique ID of admin account
admin_name	varchar(255)	Fullname of the admin
admin_uname	varchar(255)	Username of the admin for authentication
admin_pass	varchar(255)	Password of the admin for authentication
admin_email	varchar(255)	Email address of the admin
admin_privilage	varchar(255)	User level of the admin

Table 11.

Data Dictionary – tbl_bookrequest

Column	Type	Comment
bookreq_id	int(10) unsigned *Auto Increment*	Unique ID of the current table
Booktitle	varchar(255)	Title of the requested book
Bookauthor	varchar(255)	Author of the requested book
requester_name	varchar(255)	Fullname of the person that suggests the book
student_id	varchar(255)	ID number of the requester which is displayed on a requester's school ID
bookdescription	Text	Description of the requested book
Reason	varchar(255)	Reason of the requester for suggesting the book
Datetime	Datetime	The date and time of the sent request
book_image	varchar(255)	The cover image of the requested book
is_processed	varchar(255) [**no**]	Specifies the request if its processed by the admin or not
is_rejected	varchar(255) [**undecided**]	Specifies the request if the admin rejected the request

Table 12.

Data Dictionary – tbl_books

Column	Type	Comment
book_id	int(10) unsigned *Auto Increment*	Unique ID of the Book
book_cpressid	int(10) unsigned	Unique ID of the book that is compressed to store and count the quantity of the book with the same information
book_callnumber	varchar(255)	Call number of the book
book_isbn	varchar(255)	The ISBN of the book
book_title	varchar(255)	Title of the book
book_description	Text	Description of the book
book_author	varchar(255)	Author of the book
book_category	varchar(255)	Category of the book
book_datepublished	varchar(255)	The year when the book is published
book_image	varchar(255) [**images/books/empty_book.jpg**]	Cover image of the book
book_status	varchar(255) [**Available**]	Status of the book
is_trashed	varchar(255) [**No**]	Specify if the book is archived
book_price	decimal(10,0)	

Table 13.

Data Dictionary – tbl_bookscompressed

Column	Type	Comment
Id	int(11) *Auto Increment*	Unique ID of the current table
book_title	varchar(255)	The title of the book
book_description	Text	Description of the book
book_author	varchar(255)	Author of the book
book_callnumber	varchar(255)	Call Number of the book
book_isbn	varchar(255)	ISBN of the book
book_category	varchar(255)	Category of the book
book_datepublished	varchar(255)	The year when the book is published
book_quantity	Float	Quantity of the book
book_outside	float [**0**]	Number of books currently borrowed
book_repair	float [**0**]	Number of for repaired books
book_archive	float [**0**]	Number of archived books
book_image	varchar(255) [**images/books/empty_book.jpg**]	Cover image of the book
is_trashed	varchar(255) [**No**]	Specify if the book is archived
book_price	decimal(10,0)	Books_price

Table 14.

Data Dictionary – tbl_borrowedbooks

Column	Type	Comment
Id	int(11) *Auto Increment*	Unique ID of the current table
bbook_id	int(10) unsigned	Unique ID of the borrowed book
Callnumber	varchar(255)	Call number of the book
bbook_author	varchar(255)	Author of the book
date_published	varchar(255)	Book date published
book_isbn	varchar(255)	International Standard Book Number
book_price	varchar(255)	Price of the book
Course	varchar(255) *NULL*	Course of the student and school name if borrower is an outsider
Year	varchar(255) *NULL*	Year of the student
Section	varchar(255) *NULL*	Section of the student
bbook_title	varchar(255)	Title of the borrowed book
book_holder	varchar(255)	Fullname of the borrower
bh_studentid	varchar(255)	ID number of the borrower
is_returned	varchar(255) [**no**]	Specifies if the book is returned or not
date_borrowed	Date	The date when the user borrowed the book
date_returned	Date	The date when the user returned the book
Deadline	date *NULL*	The deadline given by the system
borrower_privilege	varchar(255) [**Student**]	Level of the user

Table 15.

Data Dictionary – tbl_carousel

Column	Type	Comment
Id	int(11) *Auto Increment*	Image ID
img1	varchar(255)	Image number 1 for home carousel
img2	varchar(255)	Image number 2 for home carousel
img3	varchar(255)	Image number 3 for home carousel
img4	varchar(255)	Image number 4 for home carousel

Table 16.

Data Dictionary – tbl_categories

Column	Type	Comment
Id	int(11) *Auto Increment*	ID number of category
Category_name	varchar(255)	Type of the category
status	varchar(255) [**available**]	Status of the Category

Table 17.

Data Dictionary – tbl_chat

Column	Type	Comment
id	int(10) unsigned *Auto Increment*	Unique ID of the chat
message	varchar(255)	Message content of the chat
timedate	Datetime	Time and Date of the sent message
sender	varchar(255)	Fullname of the sender

Table 18.

Data Dictionary – tbl_course

Column	Type	Comment
id	int(11) *Auto Increment*	ID number of the course
course	varchar(255)	Course of the user

Table 19.

Data Dictionary – tbl_libraryinfo

Column	Type	Comment
id	int(11) *Auto Increment*	Unique ID of Library Information
title	varchar(255)	Specify title of content
content	Text	Definition of specified title

Table 20.

Data Dictionary – tbl_outsider

Column	Type	Comment
id	int(11) *Auto Increment*	Unique ID of the current table
user_id	varchar(255)	Unique ID of the guest
user_type	varchar(255)	User Level of the user
name	varchar(255)	Fullname of the person
address	varchar(255)	Current home address of the person
number	varchar(255)	Active mobile number of the person which will be used by the system for notification features
course	varchar(255)	Current course of the user
year	varchar(255)	Current year of user
section	varchar(255)	Current section of the user
schoolname	varchar(255)	Name of the user's school
schooladdress	varchar(255)	Address of the user's school
usedbook	varchar(255)	Books A.N that is used by the outsider
bookinfo	varchar(255)	Book info that the user needs to research
form_image	varchar(255)	Image of the form
form_status	varchar(255) [**Unprocessed**]	Indicates if form is unprocessed, ready or has been used

Table 21.

Data Dictionary – tbl_professor

Column	Type	Comment
id	int(11) *Auto Increment*	Unique id of the table
prof_id	varchar(255)	Unique ID of the professor
pwd	varchar(255)	Password of the Professor
name	varchar(255)	Full name of professor
department	varchar(255)	Depart of the professor
address	varchar(255)	Home address of the user
number	varchar(255)	Contact number of the user which will receive the sms notification of the system
email	varchar(255)	Email address of the user for future feature that acts as contact number when the user have no contact number
bday	varchar(255)	Date of birth of the user
photo	varchar(255) [**images/defaultimg.png**]	A 2x2 image of the user for additional identity
status	varchar(255) [**Not Validated**]	Status of the user which determine if the user is officially enrolled or not

Table 22.

Data Dictionary – tbl_reservation

Column	Type	Comment
request_id	int(10) unsigned *Auto Increment*	Unique ID of reservation
request_bookid	int(10) unsigned	Unique ID of the selected book
request_booktitle	varchar(255)	Title of the selected book
request_timesent	Datetime	Date and Time of the reservation
request_sender	varchar(255)	Fullname of the person that sent the reservation
request_senderid	varchar(255)	ID number of the person that sent the reservation
bookslot	varchar(255)	Indicates which slot is used to place the information of the selected book
request_purpose	varchar(255)	Indicates if the selected book is to be reserved or if the person wants to cancel his/her reservation
is_processed	varchar(255) [**no**]	Indicates if the admin has processed the reservation or not
request_sendernumber	varchar(255)	Mobile number of the borrower
book_cover	varchar(255)	An image which display's the cover of the book.

Table 23.

Data Dictionary – tbl_reservedbooks

Column	Type	Comment
id	int(11) *Auto Increment*	Unique ID of the reserved books
book_id	int(11)	Unique ID of the reserved book
book_title	varchar(255)	Title of the reserved book
book_author	varchar(255)	Author of the reserved book
book_category	varchar(255)	Category of the reserved book
book_datepublished	varchar(255)	Publication year of the reserved book
borrower_id	varchar(255)	ID number of the borrower
borrower_name	varchar(255)	Fullname of the borrower
is_claimed	varchar(255) [**No**]	Indicates if the borrower has claimed the book or not
book_cover	varchar(255)	An image which display's the cover of the book.

Table 24.

Data Dictionary – tbl_textsetting

Column	Type	Comment
id	int(11) *Auto Increment*	Unique ID of the text settings
purpose	varchar(255)	Indicates the purpose of the sms
content	varchar(255)	Indicates the message of the sms which will be sent to the users

Table 25.

Data Dictionary – tbl_transactions

Column	Type	Comment
receiptnumber	int(11) *Auto Increment*	Unique ID of the transaction
name	varchar(255)	Fullname of the transacting person
student_id	varchar(255)	ID number of the transacting person
money	decimal(10,0)	Given money of the transacting person
change	decimal(10,0)	Change of the transacting person
totalpayment	decimal(10,0)	Total payment of the transacting person
remaining_penalty	decimal(10,0)	Remaining Penalty of the transacting person
transaction_reason	varchar(255) [**Did not meet deadline**]	Reason why the user had a transaction
date	Date	Date of transaction
time	varchar(255)	Time of transaction

Table 26.

Data Dictionary – tbl_users

Column	Type	Comment
id	int(10) unsigned *Auto Increment*	Unique ID of the users
student_id	varchar(255)	ID number of the user which can be found on their school ID
name	varchar(255)	Fullname of the user
bday	varchar(255)	Date of birth of the user
pwd	varchar(255) *NULL*	Password of the user
email	varchar(255)	Email address of the user
address	varchar(255)	Current home address of the user
privilage	varchar(255) *NULL* [**student**]	User level of the user
penalty	float *NULL* [**0**]	Total Penalty of the user
number	varchar(255)	Mobile number of the user
b1id	varchar(255) *NULL* [**0**]	Unique ID of the borrowed book for slot1
b1idcpress	varchar(255) *NULL*	Unique ID of the borrowed book but in the tbl_bookscompressed for slot1
pending1	varchar(255) *NULL*	Indicates the status of the book if its unprocessed by the admin, reserved for the user or if the book is claimed by the user for slot1
borrowed1	varchar(255) *NULL* [**none**]	The title of the borrowed book for slot1
b1img	varchar(255) *NULL* [**images/books/empty_book.jpg**]	Cover image of the borrowed book for slot1
borroweddate1	date *NULL*	Indicates the date of borrowing for slot1
deadline1	date *NULL*	Indicates the deadline given by the system for slot1
day_unreturned1	float *NULL* [**0**]	Counts the days if the book exceeds the given deadline for slot1
raw_date1	date *NULL*	Indicates the date today and this is used to increase the penalty of the user for slot1
b2id	varchar(255) *NULL* [**0**]	Unique ID of the borrowed book for slot2
b2idcpress	varchar(255) *NULL*	Unique ID of the borrowed book but in the tbl_bookscompressed for slot2
pending2	varchar(255) *NULL*	Indicates the status of the book if its unprocessed by the admin, reserved for the user or if the book is claimed by the user for slot2
borrowed2	varchar(255) *NULL* [**none**]	The title of the borrowed book for slot2
b2img	varchar(255) *NULL* [**images/books/empty_book.jpg**]	Cover image of the borrowed book for slot2
borroweddate2	date *NULL*	Indicates the date of borrowing for slot2
deadline2	date *NULL*	Indicates the deadline given by the system for slot2
day_unreturned2	float *NULL* [**0**]	Counts the days if the book exceeds the given deadline for slot2

Continuation of table 26

Column	Type	Comment
raw_date2	date *NULL*	Indicates the date today and this is used to increase the penalty of the user for slot2
b3id	varchar(255) *NULL* [**0**]	Unique ID of the borrowed book for slot3
b3idcpress	varchar(255) *NULL*	Unique ID of the borrowed book but in the tbl_bookscompressed for slot3
pending3	varchar(255) *NULL*	Indicates the status of the book if its unprocessed by the admin, reserved for the user or if the book is claimed by the user for slot3
borrowed3	varchar(255) *NULL* [**none**]	The title of the borrowed book for slot3
b3img	varchar(255) *NULL* [**images/books/empty_book.jpg**]	Cover image of the borrowed book for slot3
borroweddate3	date *NULL*	Indicates the date of borrowing for slot3
deadline3	date *NULL*	Indicates the deadline given by the system for slot3
day_unreturned3	float *NULL* [**0**]	Counts the days if the book exceeds the given deadline for slot3
raw_date3	date *NULL*	Indicates the date today and this is used to increase the penalty of the user for slot3
course	varchar(255)	Course of the user
year	varchar(255)	Current year of the user
section	varchar(255)	Current section of the user
academic_status	varchar(255)	Current academic status of the user
photo	varchar(255) [**images/defaultimg.png**]	Actual image of the user
status	varchar(255) [**Not Validated**]	Status of the user if validated or not validated

Table 27.

Weighted Mean and Description of the Respondents' Response on the System Functionality Test

Indicators	Weighted Mean	Description
1 All buttons in the system are working	3.40	Very Good
2 All pages in the system are working	3.80	Very Good
3 Printing is working	3.40	Very Good
4 Overall, the system is usable	3.60	Very Good
General Weighted Mean	**3.55**	**Very Good**

Table 27 exhibits the weighted mean and descriptive interpretation of the respondents' in terms of system functionality. Four questions had been answered to evaluate the functionality of the system. Based on the computation, the weighted means were: 3.40, 3.80, 3.40 and 3.60 respectively. The general weighted mean of the system functionality was 3.55 describe as "Very Good".

Table 28.

Weighted Mean and Description of the Respondents' Response on the System Usability Test

Indicators	Weighted Mean	Description
1 The system is easy to use	3.60	Very Good
2 The system has all the functions I expect it to have	3.60	Very Good
3 I am satisfied with how the system works	3.60	Very Good
4 The interface of the system is pleasant	3.80	Very Good
5 Overall, the system is user friendly	3.40	Very Good
General Weighted Mean	**3.60**	**Very Good**

Table 28 presents the weighted mean descriptive interpretation of the respondents' according to system usability. Five questions had been answered to evaluate the usability of the system. Based on the computation, the weighted means were: 3.60, 3.60, 3.60, 3.80and 3.40 respectively. The general weighted mean of the system functionality was 3.60 describe as "Very Good ".

Table 29.

Weighted Mean and Description of the Respondents' Response on the System Reliability Test

	Indicators	Weighted Mean	Description
1	Text is clear and printed suitable for target audience	3.80	Very Good
2	The system gives accurate information	4.00	Very Good
3	The flow of the system is easy to understand	3.60	Very Good
4	User can navigate throughout the program without difficulties	3.20	Very Good
5	Overall, the system provides reliable information	3.80	Very Good
General Weighted Mean		**3.68**	**Very Good**

Table 29 reveals the weighted mean and description of the respondents' response in terms of system reliability. Five questions had been answered to evaluate the reliability of the system. Based on the computation, the weighted means were: 3.80, 4.00, 3.60, 3.20 and 3.80 respectively. The general weighted mean of the system functionality was 3.68 describe as "Very Good".

Table 30.

Weighted Mean and Description of the Respondents' Response on the System Performance Test

	Indicators	Weighted Mean	Description
1	The system loads faster	4.00	Very Good
2	I feel comfortable using the system	3.60	Very Good
3	The information provided is easy to understand	4.00	Very Good
4	Overall, I am satisfied with the performance of the system	3.80	Very Good
	General Weighted Mean	**3.85**	**Very Good**

Table 30 exhibits the weighted mean and description of the respondents' response in terms of system performance. Four questions had been answered to evaluate the usability of the system. Based on the computation, the weighted means were: 4.00, 3.60, 4.00 and 3.80 respectively. The general weighted mean of the system functionality was 3.85 describe as "Very Good".

Table 31.

Weighted Mean and Description of the Respondents' Response on the System Security Test

	Indicators	Weighted Mean	Description
1	The system has a page strictly for administrator only	4.00	Very Good
2	The system has a page strictly for staff/ client only	4.20	Very Good
3	Password is encrypted for security purposes	4.00	Very Good
4	Overall, the system is secured	4.20	Very Good
	General Weighted Mean	**4.10**	**Very Good**

Table 31 presents the weighted mean and description of the respondents' response in terms of system security. Four questions had been answered to evaluate the security of the system. Based on the computation, the weighted means were: 4.00, 4.20, 4.00, and 4.20. The general weighted mean of the system functionality was 3.80 describe as "Very Good".

Table 32.

Summary of the Weighted Mean and description of the Five (5) Indicators for the "Online Library System with SMS Notification"

	Indicators	Weighted Mean	Description
1	System Functionality Test	3.55	Very Good
2	System Usability Test	3.60	Very Good
3	System Reliability Test	3.68	Very Good
4	System Performance Test	3.85	Excellent
5.	System Security Test	4.10	Excellent
	General Weighted Mean	**3.76**	**Very Good**

Tables 32 illustrate the results of the Program Evaluation Test. It shows the summary of the weighted mean of the Five (5) Indicators. As gleaned in the table, the weighted mean of the respondents' ranged from 4.10 to 3.55. The weighted mean of 4.10 is registered as the highest by the System Security Test, followed by 3.85 of System Performance Test, 3.68 of System Reliability Test, 3.60 of System Usability Test and the lowest 3.55 of System Functionality Test. Overall, the general weighted mean of system evaluation is equal to 3.76 presented as "Very Good". The result of the evaluation shows that the system is functional.