ITRW 213
PROJECT 2005

LIBRA: WEB SYSTEM
by

Preface

ITRW 213
PROJECT 2005

LIBRA: WEB SYSTEM
by 3key Systems

Module	**ITRW213**	
Document Type	**Project Proposal**	
Date	**May 2005**	
Group Name	**3key Systems**	
Group Members	**RT Fitchat**	**13156128**
	F Prinsloo	**12898643**
	JHW Steffen	**13130706**

Brief Contents

1. Scope Definition

1.1 Brief Introduction

This section defines the scope of the project, including the inherent problems of the current system; those problems which sparked the initiation of this new system, and those problems which are to be solved by this system. It describes the outputs, workings and communications of the current system which must be built in to the newly developed system, the tasks to be performed in this project, the time in which these tasks must be performed, and the budget available to perform these tasks. Questionnaires, interviews and current business documentation have been used as a tool to gather the required information in order to establish the scope definition.

1.2 Contents

- 1.3.1 Identify baseline problems
  - What problems triggered this project?

- 1.3.2 Negotiate baseline scope
  - Scope in terms of knowledge, processes and communication

- 1.3.3 Develop baseline schedule and budget
  - Statement of work

1.3.1 Identify baseline problems

What problems triggered this project?

The traditional catalog system is

- Old
- Slow
- Not regularly updated
- Not backed-up - a great security risk
- Unsecured and unreliable, due to its exposed nature
- Completely manual
- Contains no built-in safety net, i.e. its lacks automated backups
- Not accessible outside the library

Furthermore, the traditional catalog system

- Is not indicative of its status. It does not present its content in an easily human-consumable manner
- There is no prompt way to examine the state of a book, which makes it hard to verify certain key aspects of a book, including:
  - ✓ Is the book currently in the library?
  - ✓ Should the book perhaps be replaced or repaired?
  - ✓ When is the return date on any given book?
  - ✓ Has a return date been breached?
- Does not provide for making reservations in a systematic way

1.3.2 Negotiate baseline scope

Scope in terms of knowledge, processes and communication

The following pertains to the current system.

Knowledge: The book information database on the current system is a hand-written black book.

Processes: Several human errors contribute to the time consuming processes usually encountered in a library. Checking books in and out, requesting reservations, searching for books and handling accounts are all prone to disorganization and impracticality – placing a book on the wrong cabinet can cause hours of wasted time and severely hamper patron satisfaction.

Communication: The communication between staff and other system users is managed through an appointment book. As it is mostly used for various reporting purposes, it keeps track of whom to contact and any accompanying information.

1.3.3 Develop baseline schedule and budget

Statement of work

1. Purpose:

This is a statement that sets out the scope of the project, and work to be performed by the project team. It also sets out the primary deliverables and conditions of satisfaction of the project. Constraints such as deadlines, budget and technology are also made clear in this statement of work. This statement is used as a documented agreement of all the conditions and work to be done between the library and the project team.

2. Background:

- Problem, opportunity or directive statement:

  The problems of the current system are set out in the baseline problem identification section of this document.

- History leading to the project:

  Repeated visits to the respective library lead to an observable redundancy of certain tasks performed by the internal system users (henceforth referred to as *librarians*). It was decided by the project leader and the head librarian that a computerized system should be built to reduce the amount of menial tasks involved in the operation of the library.

- Project goal and objectives:

  After implementing a test system to serve as basis for further development, we will begin persistent, in-depth analysis of the needs of the system, investigating the implication of every design decision, and frequent examination of the cohesion between every system module. Some initial goals include:

  - Setting up a database with relevant tables
  - Designing a computer program to interact with the database
  - Generation of information sheets with lists of checked out books, duplicate books in the system, etc.

Considerable attention will be given to the design of security measures. A low overall learning curve to begin using the system is also of cardinal importance to the designers, and efforts will be exerted to make the system as user-friendly as possible, while retaining ultimate robustness.

The project will consist of three phases, not necessarily in sequential order. They include:

- Creation of a general computerized catalog system, as outlined in this document
- The entry of book data by librarians and volunteers
- The implementation of a website, with its prime initiative being to allow book searches over the Internet

3. Scope:

- Stakeholders
- Knowledge
- Processes
- Communication

4. Project Approach

1. Scope Definition
2. Problem Analysis
3. Requirements Analysis
4. Logical Design
5. Decision Analysis

5. Constraints:

Date of commencement: 25 March 2005

Durations and deadlines:

Task name	***Duration***	***Deadline***
SCOPE DEFINITION		
Identify baseline problems	1 day	25 March 2005
Negotiate baseline scope	2 days	29 March 2005
Develop baseline schedule and budget	2 days	31 March 2005
PROBLEM ANALYSIS		
Understand the problem domain	4 days	6 April 2005
Analyze problems and opportunities	3 days	9 April 2005
Update project plan	1 day	12 April 2005
REQUIREMENTS ANALYSIS		
Functional requirements	3 days	15 April 2005
Non-functional requirements	8 days	27 April 2005
Use-Case ranking and dependencies	2 days	29 April 2005
Update project plan	1 day	30 April 2005

LOGICAL DESIGN		
Logical date models	6 days	23 April 2005
Logical process models	6 days	5 May 2005
Update project plan	1 day	11 May 2005
DECISION ANALYSIS		
Feasibility analysis	2 days	14 May 2005
System proposal	2 days	18 May 2005
Update project plan	1 day	19 May 2005

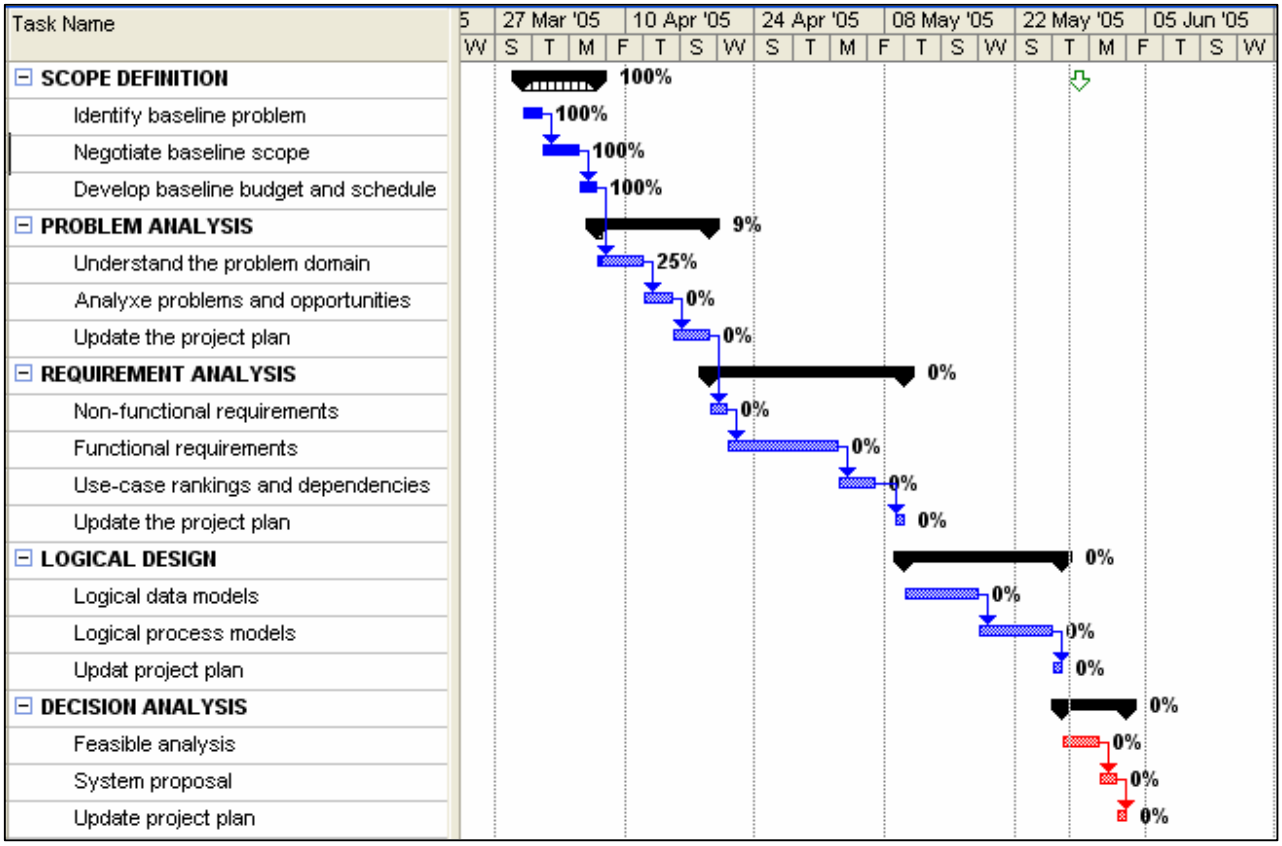
6. Budget

The accumulated cost needed to complete this project must not exceed R1000. When the estimated cost approaches the R1000 limitation, the system owner will need to be informed, and the course and the extent in which the project should head, will be disclosed by a board of stakeholders. If time and implementation costs permit, the system will have the ability to work in a LAN environment. Therefore, all the necessary equipment will need to be available to facilitate this prerequisite. The “bottom line” is that the hand system must be transformed into a computerized system. A standard printer can be used to print the documentation. These necessities will become part of our objectives.

7. Estimates

Schedule estimate:

The chart on the subsequent page illustrates the critical and non-critical tasks, as well as the slack time (in days), of the project. The whole project is planned up to the *decision analysis phase*. At this point of the documentation, 100% of the scope definition has been completed and approximately 30% of the first task of the next phase - *Understand the problem domain* - has already been completed. As estimated, according to the chart, this documentation is forecasted to be completed on May 27th, 2005.



7. Conditions and satisfactions

Success criteria
The success will be measured against the solving and completion of the identified problems.

Assumptions
No work will be done on Sundays by any member of the project team. Work will be done during the rest of the week from 17:30 in the evening.

Mr. T. Fitchat will act as the project team leader and will take full responsibility for managing the project until its completion.

All enquires, difficulties and problems whatsoever must be communicated through Mr. F. Prinsloo.

The project team is allowed to ask at any time for documentation, make observations of the current process, conduct interviews with the client staff, hand out questionnaires, and perform any other related action in order to fulfill their work.

2. Problem Analysis

2.1 Brief Introduction

This section gives a detailed description of all the current system's problems, which are to be solved by the new system. Discussions also include descriptions of how to go about obtaining solutions to the problems. This section begins by giving an understanding of the current system, and then discusses the causes, effects and improvement objectives for those problems.

2.2 Contents

- 2.3 Understand the problem domain
  - The current system in terms of knowledge, processes and communications

- 2.4 Analyze problems and opportunities
  - 2.4.1 Overview of current system operations
    - 2.4.1.1 System participants and interested parties
    - 2.4.1.2 System environment
  - 2.4.2 Analysis of the current system

- 2.5 Analysis of the current system
  - 2.5.1 Causes, effects and improvement objectives

- 2.6 Update project plan
  - Progress report

2.3 Understand the problem domain

The current system in terms of knowledge, processes and communication

KNOWLEDGE

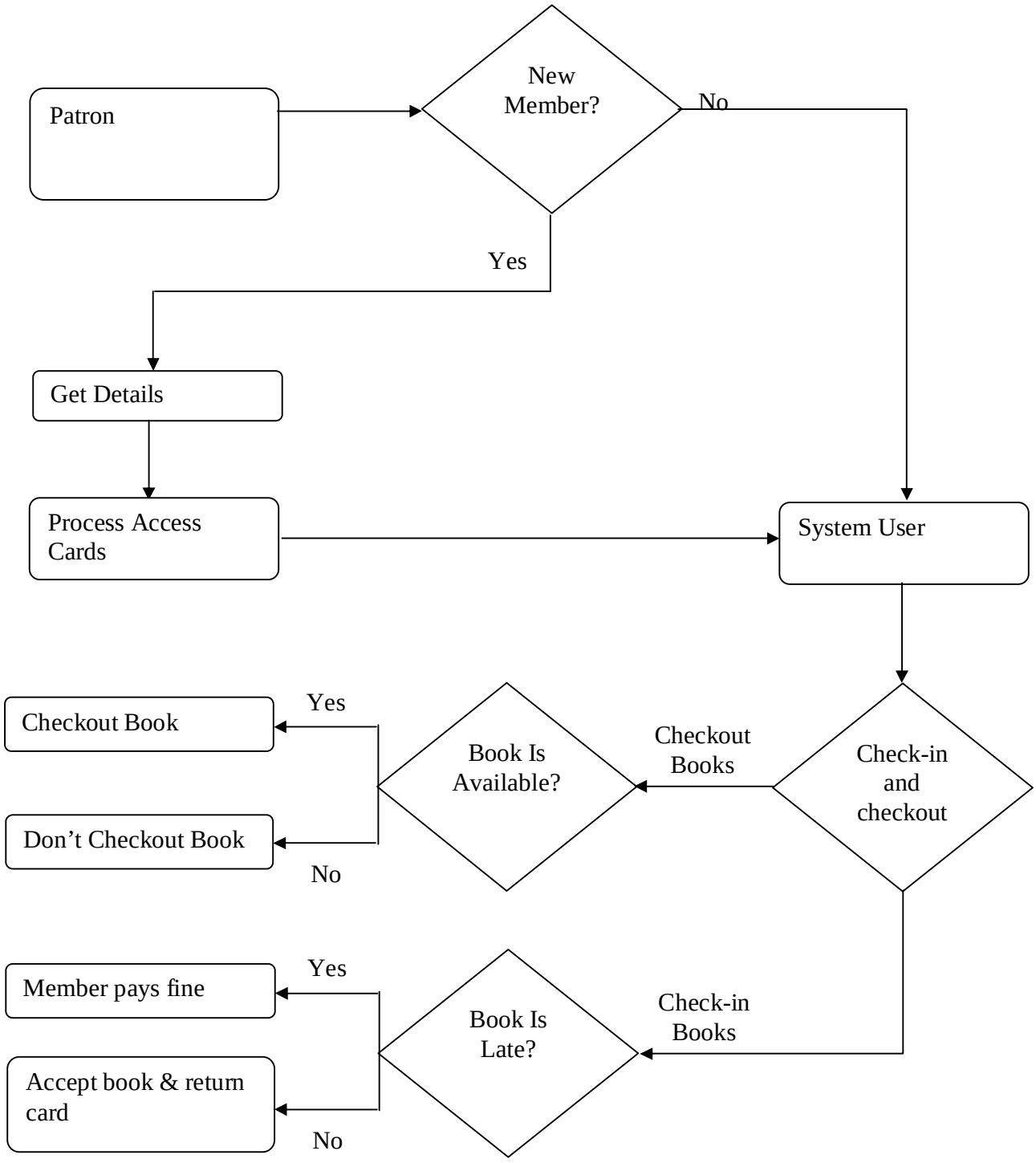


Fig 2.1 – Current system process diagram

The process diagram outlined in Fig. 2.1 illustrates the current hand-based system. This environment needs to be restructured and computerized, in order to gain increased performance, stability and integrity, and decrease those problems that hinder the flow of operations within the library.

PROCESSES

The diamond-shaped items in Fig. 2.1 describe the processes involved in the current system:

New Member?

This process determines whether a patron is already a member of the library. If not, a patron is allowed to become a member by completing the subscription process as detailed in the diagram. If a patron is a member, he/she is allowed to use the check-in and checkout services of the library.

Book Is Available?

This process, usually conducted by the head librarian, determines whether a book is available for checkout. A book is not available if it has been checked out by another member, or if the book is in some way unable to be checked out. A book is available if any member can check it out.

Book Is Late?

This process determines whether the return date of a checked-out book has expired. A member is fined a nominal fee for not being in accordance with the regulations of the library.

COMMUNICATIONS

There exists communication between the internal and external system users in the current hand system. For this project's purposes, the internal system users include the major stakeholders - the librarians - and the external system users – the library members.

The most common forms of existing communication within the current system include:

- Librarians notifying members of late books and those books whose return dates are imminently pending.
- Members inquiring whether a book is resident in the library.

It is observable that not much communication exists between the stakeholders of the current system; it is kept to the bare minimum, just to make the system functional. We refer the reader back to the baseline problems of the scope definition of this document, to review the initial problems that prompted the development of this new project.

2.4 Analyze problems and opportunities

2.4.1 Overview of current system operations

In this section of the report, we represent our understanding of the current system operations.

2.4.1.1 System participants and interested parties

To date, we have identified the following list of participants for the new system.

1. Management
   These are the direct or internal system users. They are referred to as the librarians in this document.

2. Other direct users
   These include all patrons of the library. Special privileges are given to members, such as the check-in, checkout and reservation of books. These, and other rules, will be acknowledged in the Physical Design and Integration phase of the system's development.

3. Interested parties
   People or departments affected by or interested in the system, but not necessarily a stakeholder in the system.

2.4.1.2 System Environment

The system we intend to computerize can be broken down into the following subsystems:

Member Information
Accounts
Book Information
Checkouts/check-ins
Reservations
Blacklist

Note that Accounts are not to be confused with Member Information, as not all members hold valid accounts.

2.5 Analysis of the current system

This is the most important section of this report. It analyzes the current system, describing and analyzing problems, opportunities and constraints. Problems, opportunities and constraints have been identified by all those system users who

are also stakeholders in the system. Bear in mind that we are analyzing the *system* and not the *people* in the system.
A **problem** is a situation that results in an undesirable side-effect. All problems will be defined in the following way: problem statement, cause(s) and net effect(s).

2.5.1 Causes, effects and improvement objectives

Cause and effect analysis

Project: Libra: Web System	Project Leader: Mr T Fitchat
Analysis created by: Mr F Prinsloo	Last update by: Mr F Prinsloo
Date created: April 12th, 2005	Date modified: May 20th, 2005

CAUSE AND EFFECT ANALYSIS		**SYSTEM IMPROVEMENT OBJECTIVES**	
Problem or Opportunity	**Causes and Effects**	**System Objective**	**System Constraint**
1. Hand system completely manual. 2. The computer can give the opportunity for great speed benefits. 3. Books cannot be constantly updated. 4. The system has no automatic backup feature. 5. Current system is insecure and unreliable. 6. Status of books is hard to attain. 7. Communication between the system,	Faster work throughput. Noticeable in every area of the library. Books cannot be readily added, removed and updated. Data loss occurs frequently. Appropriate security privileges are not allotted to *types* of system users, like administrators and external users. Of chief importance is the status of any book in the library, and this information is not easily collected from, and	1. We will computerize the hand system. 2. User interface must be extremely user-friendly but remain functional. 3. Regular self-updating system back-end. 4. Book entries must be easily updateable. 5. All information must easily be retrieved in a user friendly way. 6. All information that is retrieved must be in the desire for the librarian. A Automated Backed-system for the database must be in place. The system must be bug free and all information must be reliable. The status of all books in the library must be	The amount of computers in the library for the librarians' use is limited. System needs a low learning curve.

librarians and members is restricted. 8. There is no blacklist. 9. Reservations not easily made. 10. Members do not have to the catalog outside of the library.	retrieved by, a system user. Book returns: the librarian is exposed to a lot of manual paper work regarding the status of books, including information such as checked-out, checked-in and reserved books, and also the status of members' accounts. The cases of members found guilty of library violations are often overlooked. Library loses reputation for the lack of sufficient features, and gets crippled in terms of available funds. Because there is this accessibility gap, users are not able to quickly access the catalog.	recorded. A Blacklist must be in the database to keep record of people who damage or is found guilty of violations the Library's rules. Reservations must be available features for members. Users will be able to access the catalog from the comfort of their own homes via a website front-end, where users can initiate book searches, and even read up on the history of a library.	

2.6 Update project plan

Project progress report:

Summary of progress:

Scheduled analysis:
Since the completion of the previous phase, it has been found that the completion date is still expected to be June 2nd, 2005, and hence, the project is still on schedule. This phase ended on April 18th, 2005.

Budget analysis:
The project is still within budget. The total cost spent thus far is R250, which is less than the available limit of R1000.

The updated time schedule:
The schedule is shown on the next page.

3. Requirements Analysis

3.1 Brief Introduction

All the project's requirements will be analyzed in this phase.

3.2 Contents

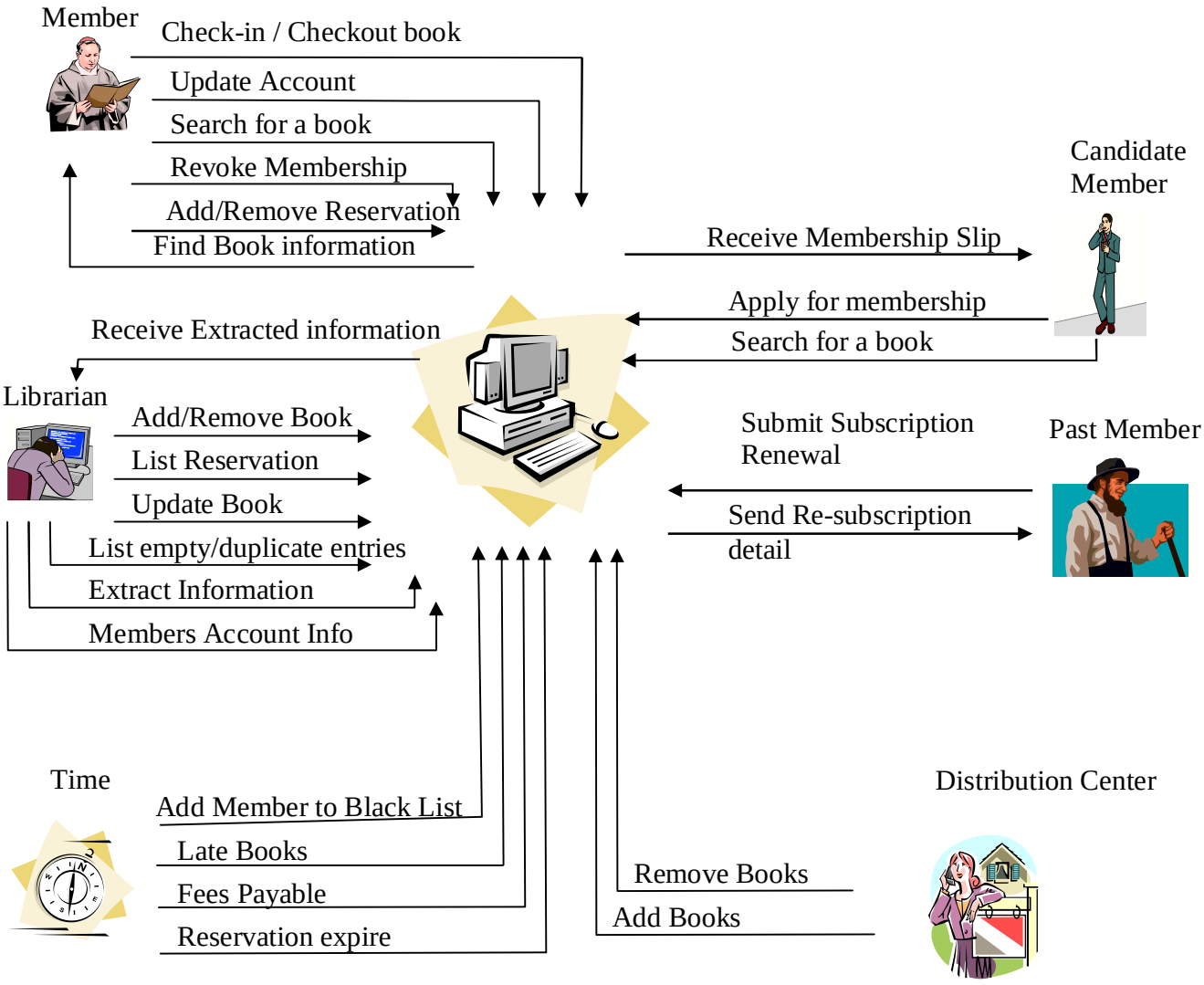
- 3.3 Functional requirements
  - 3.3.1 Actor Glossary
  - 3.3.2 Member Context Diagram
  - 3.3.3 Use-Case Glossary
  - 3.3.4 Construct Use-Case Model Diagram and Relationships
  - 3.3.5 Use-Case Descriptions
- 3.4 Use-Case ranking and dependencies
- 3.5 Update project plan

3.3 Functional requirements

3.3.1 Actor Glossary

Term	Synonym	Description
1. Candidate Member		An individual person that wants to borrow (check out) books for a period of time.
2. Past Member	Inactive Member	A member that damages books or who bring books back late.
3. Member		An individual that has joined the library and has gained permission to check out books.
4. Member Services	Librarian	Person who is responsible to help a member in the library search for, check in and check out, a book.
5. Distribution Center	Main Library or Book Agent	The place where new or “in wanting” books can be acquired to add stock to this library.
6. Time		Actor concept responsible for triggering events such as late book check-ins.

3.3.2 Member Context Diagram



3.3.3 Use-Case Glossary

Use-Case Name	Use-Case Description	Participating Actors and Roles
Submit Member Detail	This case describes a candidate who submits data to become a member.	• Candidate Member • Librarian
Reservation of Books	This case describes a member being added to a queue to be notified when a book is available, or conversely, to prevent its checkout.	• Member
Book Checkout	This case describes the event of a member checking out a book.	• Member
Book Check-in	This case describes the event of a member that brings a book back after a period of time.	• Member
Book Search	This case describes the event where a book in the database is searched for.	• Member • Candidate • Librarian • Distribution Center
Revoke Membership	This case describes the event where a member is removed from the Library's Database.	• Member
Remove Reservation	This case describes the event where a reservation that was made is being cancelled.	• Member • Time
Add Reservation	This case describes the event where a book is booked to be borrowed in the future.	• Member
Add Book	This case describes the event where a book is to be added to the Library's Database	• Distribution Center • Librarian
Remove Book	This case describes the event where a book is removed from the Library's Database	• Librarian • Distribution Center
List empty/duplicate entries	This case describes the event where there is looked if there is any duplicate or empty entries made when a book is added to the database.	• Librarian • Distribution Center

Update Book	This case describes the event where a book's detail is changed due to a spelling error or reading fault.	• Librarian • Distribution Center
Extract Information	This case describes the event where specific records (i.e. black list information) are extracted from the various tables that satisfy the query of the librarian.	• Librarian
Members Account Info	This case describes the event where member and account data can be extracted and used for statistical purposes.	• Librarian
Receive Membership Slip	This case describes the event where Candidate becomes a member, and he receives prove of it.	• Candidate • Librarian
Submit Subscription Renewal	This case describes the event where a person who is on a black list and ask permission to take his/her name of and to become an active member again.	• Inactive Member
Confirm Re-subscription	This case describes the event where the subscription renewal was approved or disapproved.	• Librarian • Inactive Member
Reservation expire	This case describes the event where a period of time has elapsed and the reservation is therefore automatically cancelled as it is not valid any longer.	• Time
Fees Payable	This case describes the event where the librarian is made aware of an account expiry due to a period of time which has elapsed.	• Time
Late Books	This case describes the event where a book has not been returned on the required return date and that the member should be notified.	• Time • Member
Add Member to Black List	This case describes the event where a member is found to continually return books late and/or damage checked out book, and as such, should be blacklisted.	• Member • Librarian
Update Account	This case describes the event where a member settles his/her feed payable.	• Member

3.3.4 Construct Use-Case Model Diagram and Relationships

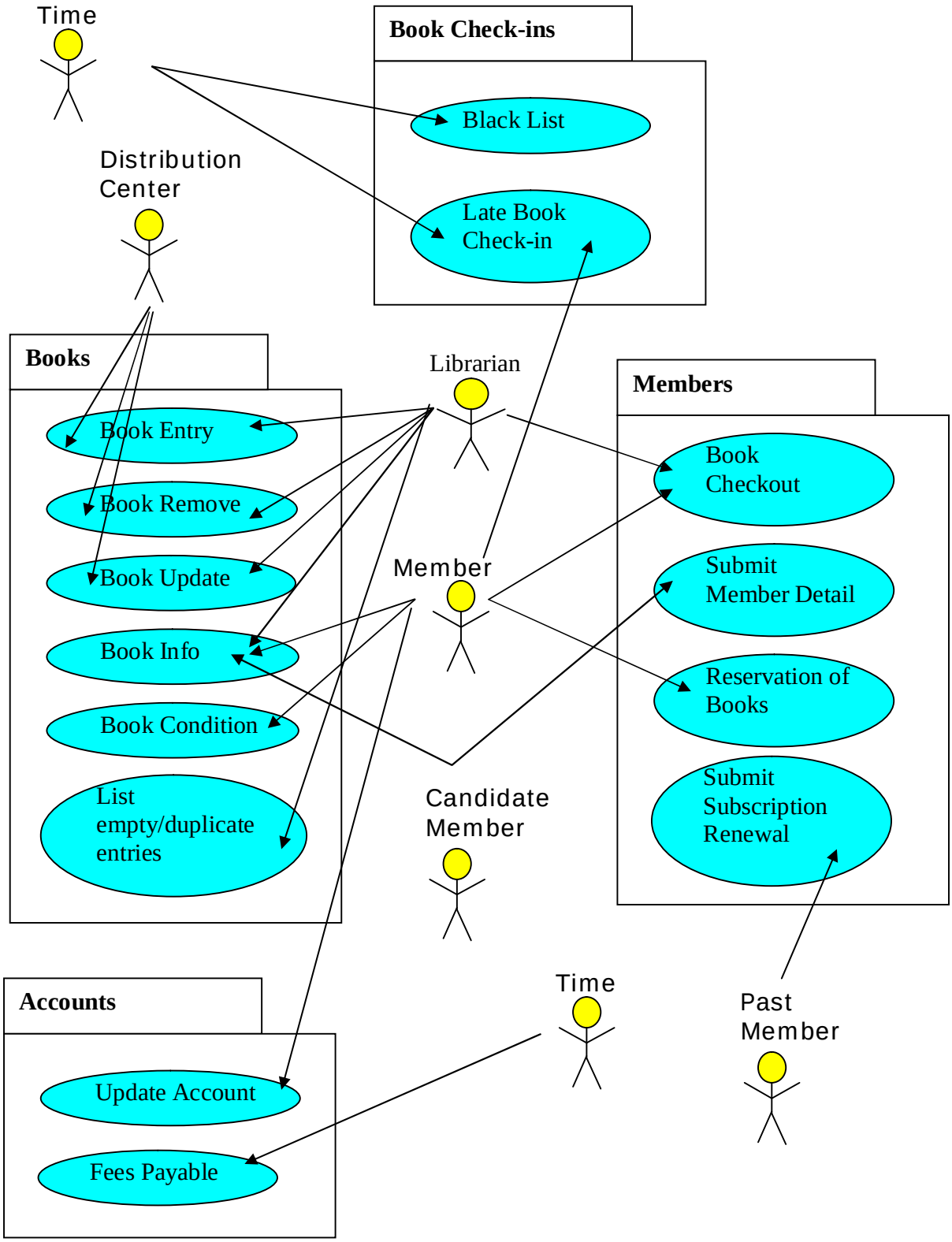
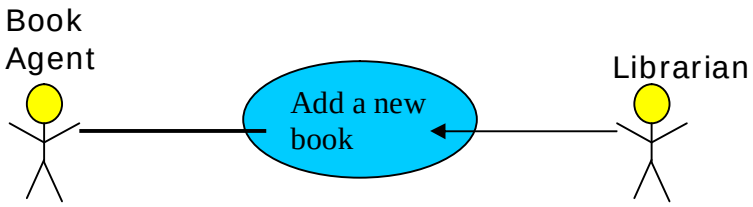


Fig 3.1 Use-Case Model Diagram

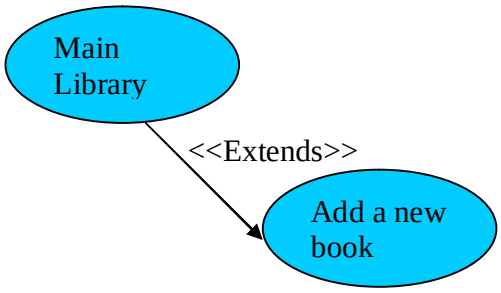
It is noticeable from Fig 3.1 that the Libra: Web System currently contains four sub-systems: Books, Members, Book Check-ins, and Accounts.

Associative relationship



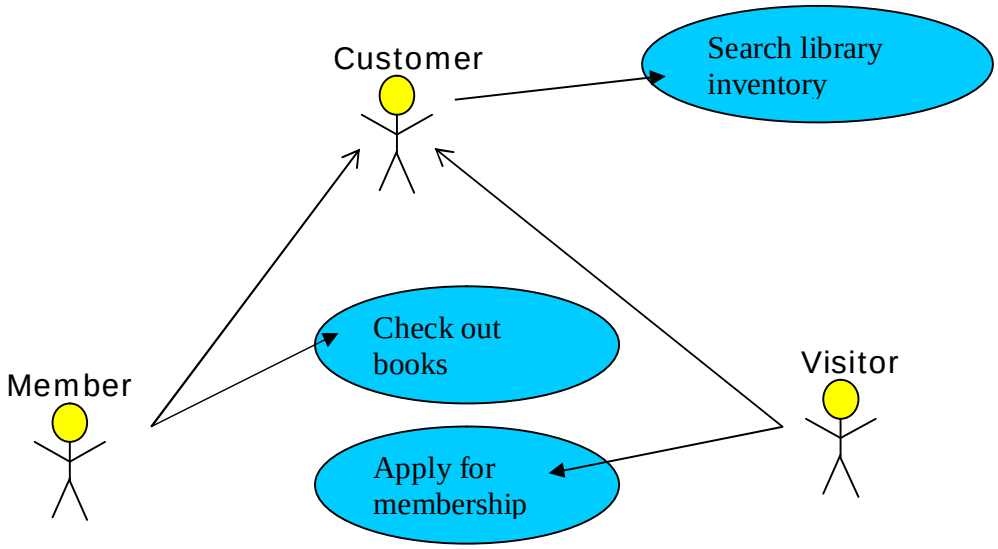
This *association diagram* describes the relationship between a book agent and the process of a librarian applying for new books.

Extension Use Case



This diagram describes the extension between the primary (supplying) library and the secondary library, where the acquisition of new books creates a supply chain from the main to the sub libraries.

Inheritance relationship



This diagram illustrates the inheritance relationship between a visitor and a customer, and between a member (patron) and a customer.

3.3.5 Use-Case Descriptions

Use-Case Name:	Submit Member Detail	**Use-Case type:**
Use-Case ID:	UC001	
Priority:	Medium	Business requirements: √
Source:	Member Form	
Primary Business Actor:	Librarian	
Other Participating Actors:	Candidate Member	
Description:	This case describes the event where a visitor to the library submits their details in order to become a member of the library.	
Precondition:	• The party shall not already be a member. • The party can not be blacklisted.	
Trigger:	This Use-Case is initiated when a new member is to be added to the member database.	
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** The member provides his or her personal information **Step 2:** The system responds that verify that all requirement information has been provided **Step 3:** The system checks whether the member is already in the database, aborts if necessary **Step 4:** The system check whether the member is black listed, aboard if necessary. **Step 5:** The system records the member data in the member database. **Step 6**: A membership slip is optionally printed to verify membership status.	
Conclusion:	A membership slip is optionally printed to verify membership status.	
Post condition:	Members can make use of onsite and offsite services provided by the system.	
Business Rules:	• Duplicate ISBNs, Book Numbers and Process Entity IDs (primary keys) are invalid. • Duplicate membership information is not allowed. • One book can not be checked out more than once. • Membership is valid for exactly one year after subscription date. • Only available books can be reserved.	

Use-Case Name:	Reservation of Books	**Use-Case type:**
Use-Case ID:	UC002	
Priority:	High	Business requirements: √
Source:	Reservation form	
Primary Business Actor:	Member	
Other Participating Actors:	Librarian	
Description:	This case describes a member being added to a queue to be notified when a book is available, or conversely, to prevent its checkout.	

Precondition:	Patron must be a member
Trigger:	A reservation form is submitted for processing.
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** Member fills in reservation form. **Step 2:** Reservation information is inserted into reservation table. **Step 3:** System confirms that the information has been successfully inserted into the table.
Post condition:	The information was recorded, and the user will be notified when the book is available for checkout.

Use-Case Name:	Book Checkout	**Use-Case type:**
Use-Case ID:	UC003	
Priority:	High	Business requirements: √
Source:	Member	
Primary Business Actor:	Member	
Other Participating Actors:	Librarian	
Description:	This case describes the event of a member checking out a book.	
Precondition:	The member initiating a book checkout must have a valid account. The book must be available.	
Trigger:	This use case is activated when a member checks out a book.	
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** Member presents his membership card. **Step 2:** System verifies member account details by ensuring member is not on blacklist and that account fee is not in arrears. **Step 3:** System verifies that book is available for checkout, i.e. it is not reserved by another member. **Step 4:** Member supplies his membership card (library card) as collateral to be able to checkout the book, thereby enforcing the integrity of the system. **Step 5:** Relevant checkout information, including book and member information, and book return date, is recorded into database.	
Post condition:	A book is checked out and made unavailable until returned by member.	

Use-Case Name:	Book Check-in	**Use-Case type:**
Use-Case ID:	UC004	
Priority:	High	Business requirements: √
Source:	Patron	
Primary Business Actor:	Member	
Other Participating Actors:	Librarian	
Description:	This case describes the event of a member that brings a book back after a period of time.	

Precondition:	The book must be checked out.
Trigger:	A patron returns a book.
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** Patron returns a checked out book to the library. **Step 2:** System updates checkout table's *actual return date* column with the current date. **Step 3:** System Verifies that book is available for other members.
Post condition:	Book is available again to be checked out. The first member on the reservation list is notified of this availability.

Use-Case Name:	Book Search	**Use-Case type:**
Use-Case ID:	UC005	
Priority:	High	Business requirements: √
Source:	Patron Librarian Distribution Center Member	
Primary Business Actor:	Patron	
Other Participating Actors:	None	
Description:	This case describes the event where a book in the database is searched for.	
Precondition:	None	
Trigger:	Book search is lunched	
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** Patron logs into search screen. **Step 2:** System provides requested book information.	
Post condition:	None	

Use-Case Name:	Revoke Membership	**Use-Case type:**
Use-Case ID:	UC006	
Priority:	Low	Business requirements: √
Source:	Librarian	
Primary Business Actor:	Not Applicable	
Other Participating Actors:	None	
Description:	This case describes the event where a member is removed from the Library's Database.	
Precondition:	Member ask for removal of membership Or Member damage book Or Member Check-in books late sequently	
Trigger:	Request from librarian	
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** Librarian or member request for membership account removal. **Step 2:** Membership of member is removed from database. **Step 3:**	

		System verifies removal by a massage.
Post condition:	None	

Use-Case Name:	Remove Reservation	**Use-Case type:**
Use-Case ID:	UC007	
Priority:	Medium	Business requirements: √
Source:	Time	
Primary Business Actor:	Member	
Other Participating Actors:	None	
Description:	This case describes the event where a reservation that was made is being cancelled.	
Precondition:	None	
Trigger:	Time or Librarian request for removal	
Typical course of events:	**Actor Action:** / **Step 1:** Removal is requested.	**System Response:** / **Step 2:** Reservation is removed. **Step 3:** System verifies removal by a message.
Post condition:	None	

Use-Case Name:	Add Book	**Use-Case type:**
Use-Case ID:	UC008	
Priority:	Low	Business requirements: √
Source:	Book invoice	
Primary Business Actor:	Librarian	
Other Participating Actors:	Distribution Center	
Description:	This case describes the event where a book is to be added to the Library's Database	
Precondition:	Book must be paid for in full.	
Trigger:	New books invoice number	
Typical course of events:	**Actor Action:** / **Step 1:** New books detail is submitted	**System Response:** / **Step 2:** System response that all information is submitted into the database. **Step3:** System Verifies that book is available for other members.
Post condition:	Book is available to be checked out. The first member on the reservation list is notified of this availability if this book was reserved.	

Use-Case Name:	Remove Book	**Use-Case type:**
Use-Case ID:	UC009	
Priority:	Low	Business requirements: √
Source:	Bad book rank	
Primary	Librarian	

Business Actor:	
Other Participating Actors:	None
Description:	This case describes the event where a book is removed from the Library's Database
Precondition:	The book that needs to be removed must be in a bad condition.
Trigger:	Librarian request for book removal
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** Book is removed from library **Step 2:** Book information to be removed is submitted into the system. **Step 3:** System verifies the removal of the book by a massage.
Post condition:	None

Use-Case Name:	List empty/duplicate entries	**Use-Case type:**
Use-Case ID:	UC010	
Priority:	Medium	Business requirements: √
Source:	Book Reports	
Primary Business Actor:	Librarian	
Other Participating Actors:	Distribution Center	
Description:	This case describes the event where there is looked if there is any duplicate or empty entries made when a book is added to the database.	
Precondition:	A book field in database is empty or there are duplicates.	
Trigger:	The request for a empty/duplicate document	
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** Request for empty/duplicate list **Step 2:** System response to give a list of all empty fields or duplicate entries of books.	
Post condition:	None	

Use-Case Name:	Update Book	**Use-Case type:**
Use-Case ID:	UC011	
Priority:	Medium	Business requirements: √
Source:	Wrong information book document	
Primary Business Actor:	Librarian	
Other Participating Actors:	Distribution Center	
Description:	This case describes the event where a book's detail is changed due to a spelling error or reading fault.	
Precondition:	Book information must be wrong on the system.	
Trigger:	Request to correct mistake	
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** / **Step 2:**	

	Submit correct book information	System response by verifying book information.
Post condition:	None	

Use-Case Name:	Extract Information	**Use-Case type:**
Use-Case ID:	UC012	
Priority:	Medium	Business requirements: √
Source:	Request from patron	
Primary Business Actor:	Librarian	
Other Participating Actors:	None	
Description:	This case describes the event where specific records (i.e. black list information) are extracted from the various tables that satisfy the query of the librarian.	
Precondition:	None	
Trigger:	There is requested for information about user or accounts or books	
Typical course of events:	**Actor Action:** / **Step 1:** Type of information required is submitted	**System Response:** / **Step 2:** Information is gathered from the database to give the required information
Post condition:	None	

Use-Case Name:	Members Account Info	**Use-Case type:**
Use-Case ID:	UC013	
Priority:	Medium	Business requirements: √
Source:	Request for a membership account detail	
Primary Business Actor:	Member	
Other Participating Actors:	Librarian	
Description:	This case describes the event where member and account data can be extracted and used for statistical purposes.	
Precondition:	none	
Trigger:	Time	
Typical course of events:	**Actor Action:** / **Step 1:** Librarian request members information is a statistic form	**System Response:** / **Step 2:** System Response by printing statistics of members.
Post condition:	none	

Use-Case Name:	Receive Membership Slip	**Use-Case type:**
Use-Case ID:	UC014	
Priority:	High	Business requirements: √
Source:	Membership subscription form.	
Primary Business Actor:	Patron	
Other Participating Actors:	Librarian	

Description:	This case describes the event where Candidate becomes a member, and he receives prove of it.
Precondition:	Patron in not already a member Patron must not be on the blacklist
Trigger:	Membership form
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** Patron detail is submitted **Step 2:** System responds by printing a membership slip.
Post condition:	Patron became a member.

Use-Case Name:	Submit Subscription Renewal	**Use-Case type:**
Use-Case ID:	UC015	
Priority:	Medium	Business requirements: √
Source:	Renewal form	
Primary Business Actor:	Member	
Other Participating Actors:	Librarian	
Description:	This case describes the event where a person pays their annual subscription fee. A member who is on a black list hereby asks for permission to take his/her name off and to become an active member again.	
Precondition:	Member has an invalid account, due to subscription fee outstanding, or from having their name on the black list.	
Trigger:	Member who submits a subscription renewal form.	
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** Member fills in and submits appropriate form. **Step 2:** If member is not on the black list, their subscription fee is accepted, and their membership is renewed.	
Alternate course of events:	If member is on the blacklist, their subscription renewal form will be added to a cache of renewal forms to be approved by a library panel that has the authority to grant or deny this member the right to have a valid account.	
Post condition:	The member's invalid account is renewed, thereby granting them access to privileged library services once more.	

Use-Case Name:	Reservation expire	**Use-Case type:**
Use-Case ID:	UC016	
Priority:	Medium	Business requirements: √
Source:	Time	
Primary Business Actor:	None	
Other Participating Actors:	Other members in reservation queue	
Description:	This case describes the event where a period of time has elapsed and the reservation is therefore automatically cancelled as it is not valid any longer.	
Precondition:	Reservation has expired and book has not been collected by member who initiated the reservation.	
Trigger:	Time	
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** The amount of time for which a reservation is valid, has expired. **Step 2:** System removes the reservation information from the reservation table.	

Post condition:	The member's invalid account is renewed, thereby granting them access to privileged library services once more.

Use-Case Name:	Fees Payable	**Use-Case type:**
Use-Case ID:	UC017	
Priority:	Low	Business requirements: √
Source:	Time	
Primary Business Actor:	Librarian	
Other Participating Actors:	None	
Description:	This case describes the event where a member's account has expired due to a period of time which has elapsed, and therefore, the librarian has to be made aware of this.	
Precondition:	A member's account has expired	
Trigger:	A period of time has elapsed, thereby rendering a valid member account invalid.	
Typical course of events:	**Actor Action:** / **Step 1:** The amount of time for which an account is valid (by default, 1 year), has expired.	**System Response:** / **Step 2:** System invalidates member account. **Step 3:** System informs librarian by means of a message box or window that an account has become invalid.
Post condition:	The member's valid account is now invalid.	

Use-Case Name:	Late Books	**Use-Case type:**
Use-Case ID:	UC018	
Priority:	High	Business requirements: √
Source:	Time	
Primary Business Actor:	Librarian	
Other Participating Actors:	None	
Description:	This case describes the event where a book has not been returned on the required return date, and therefore the member should be notified.	
Precondition:	A checked-out book has not been returned on or before the required return date.	
Trigger:	A period of time has elapsed, and a book has not yet been returned.	
Typical course of events:	**Actor Action:** / **Step 1:** The amount of time for which a book can be checked-out has expired.	**System Response:** / **Step 2:** System informs librarian by means of a message box or window that an expiry has occurred. The librarian must now take the appropriate steps.
Post condition:	A return date has been breached, and the librarian has been notified.	

Use-Case Name:	Add Member to Black List	**Use-Case type:**
Use-Case ID:	UC019	
Priority:	High	Business requirements: √
Source:	Time	

Primary Business Actor:	Librarian
Other Participating Actors:	None
Description:	This case describes the event where a member is found to continually return books late and/or damage checked out books, and as such, should be blacklisted.
Precondition:	A member's account has been declared invalid by the library board.
Trigger:	A librarian adds a member to the black list.
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** Librarian adds member to black list. **Step 2:** System adds member information to black list database table. **Step 3:** The system informs the librarian that the blacklist is updated.
Post condition:	A member is now on the blacklist.

Use-Case Name:	Update Account	**Use-Case type:**
Use-Case ID:	UC020	
Priority:	Medium	Business requirements: √
Source:	Payment	
Primary Business Actor:	Member	
Other Participating Actors:	Librarian	
Description:	This case describes the event where a member settles his/her fees payable.	
Precondition:	Fees payable must be sufficient.	
Trigger:	Member settles their account.	
Typical course of events:	**Actor Action:** / **System Response:** **Step 1:** Member supplies some form of payment (either cash or cheque). **Step 2:** System updates the member's account information. **Step 3:** System prints a physical proof for payment for the library and the member.	
Post condition:	A member now has a valid account for the relevant period.	

3.4 Use-Case ranking and dependencies

The Use-Cases matrix is used to show the rankings of each individual Use-Case against the six following criteria items:

1) Significant impact on the architectural design
2) Easy to implement but contains significant functionality
3) Includes risky, time-critical, or complex functions
4) Involves significant research or new or risky technology
5) Includes primary business functions
6) Will increase revenue or decrease costs

Use-Case Name	**Ranking Criteria, 1 to 5**						**Total Score**	**Priority**	**Build Cycle**
	1	2	3	4	5	6			
Submit Member Detail	4	5	3	3	3	1	19	Medium	2
Reservation of Books	4	4	3	3	4	3	21	High	2
Book Checkout	4	2	3	3	5	3	20	High	1
Book Check-in	5	5	5	4	5	5	29	High	1
Book Search	4	4	3	4	4	4	23	High	3
Revoke Membership	3	3	3	2	1	3	15	Low	3
Remove Reservation	5	4	3	3	4	2	21	Medium	3
Add Book	4	4	2	3	3	2	17	Medium	1
Remove Book	3	3	4	3	3	2	18	Low	1
List empty/duplicate entries	4	2	3	3	2	3	17	Medium	2
Update Book	3	3	2	2	4	2	16	Medium	1
Extract Information	2	5	4	1	1	3	16	Medium	2
Members Account Info	4	3	3	1	2	1	14	Medium	3
Receive Membership Slip	3	3	2	2	4	2	16	High	3
Submit Subscription Renewal	3	3	4	3	3	2	18	Medium	3
Reservation expire	2	2	2	2	2	3	13	Medium	3
Fees Payable	2	1	3	4	2	2	14	Medium	3
Late Books	4	1	1	2	3	2	13	Low	2
Add Member to Black List	4	5	5	3	4	4	25	High	2
Update Account	3	3	3	3	3	1	16	Medium	2

3.5 Update project plan

Project progress report:

Summary of progress:

Scheduled analysis:
Since the completion of the previous phase, it has been found that the completion date is still expected to be June 2nd, 2005, and hence, the project is still on schedule. This phase ended on May 10th, 2005.

Budget analysis:
The project is still within budget. The total cost spent thus far is R380, which is less than the available limit of R1000.

The updated time schedule:
The schedule is shown on the next page.

4. Logical Design

4.1 Brief Introduction

In this phase, use-cases will be modeled and brought into perspective with regards to their sub-processes and the entities on which they operate. Initiating events, actors and data flows will be identified, and will be coerced into logical units of the system.

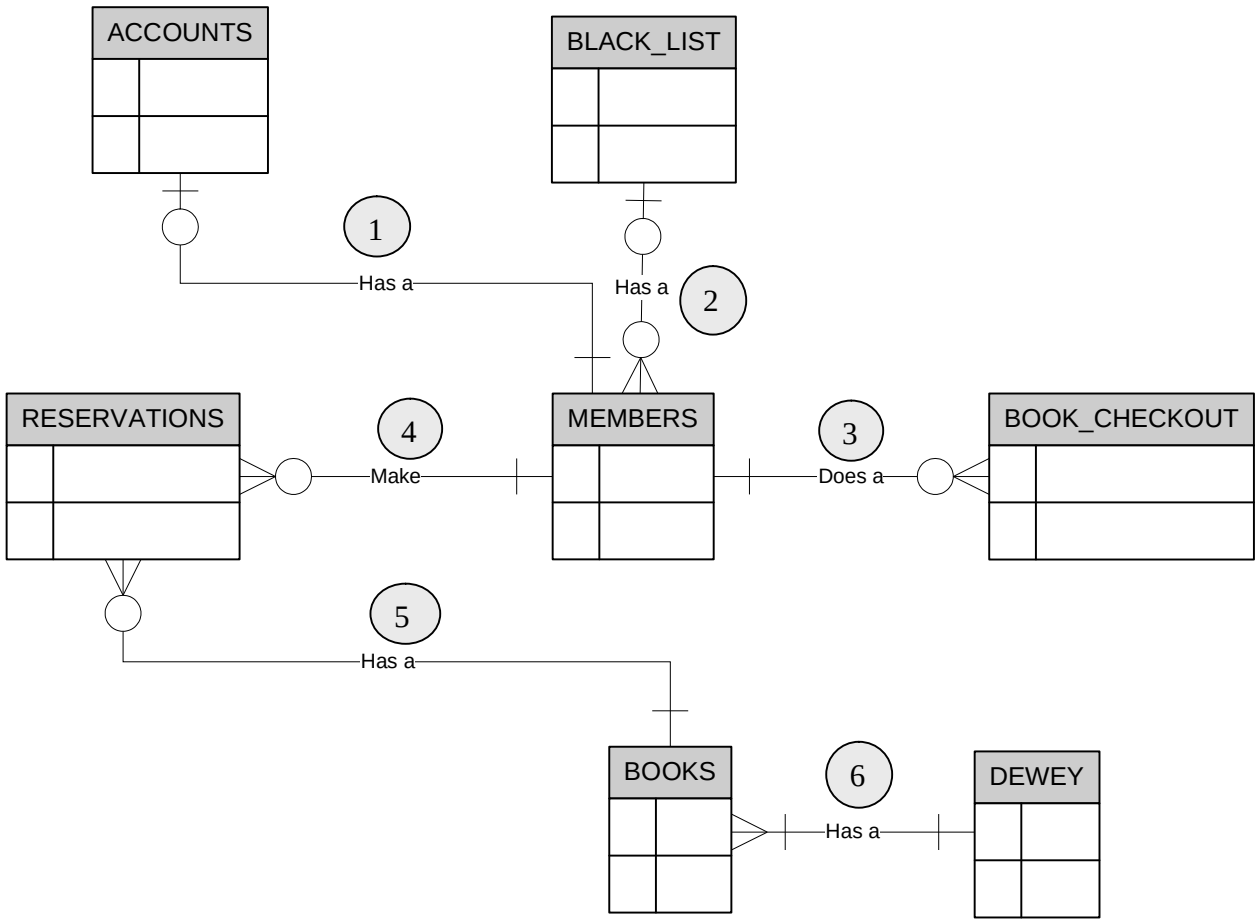
4.2 Contents

4.3 Logical Data Models

4.3.1 Entity Discovery

Book Entry	The descriptive information of a book will be stored in this entity.
Dewey	Driehoek Library books are cataloged according to their Dewey decimal codes, and as such, all the types will be stored in this entity.
Reservations	Book reservations will be stored in this entity.
Checkouts	The information pertaining to book checkouts will be kept in this entity.
Members	All the necessary member details will be recorded in this entity.
Accounts	Every Member must have an account in order to be able to check out a book.
Blacklist	Records patrons who have a history of behaving outside the accordance of the library regulations. Such actions include damaging or destroying library property.

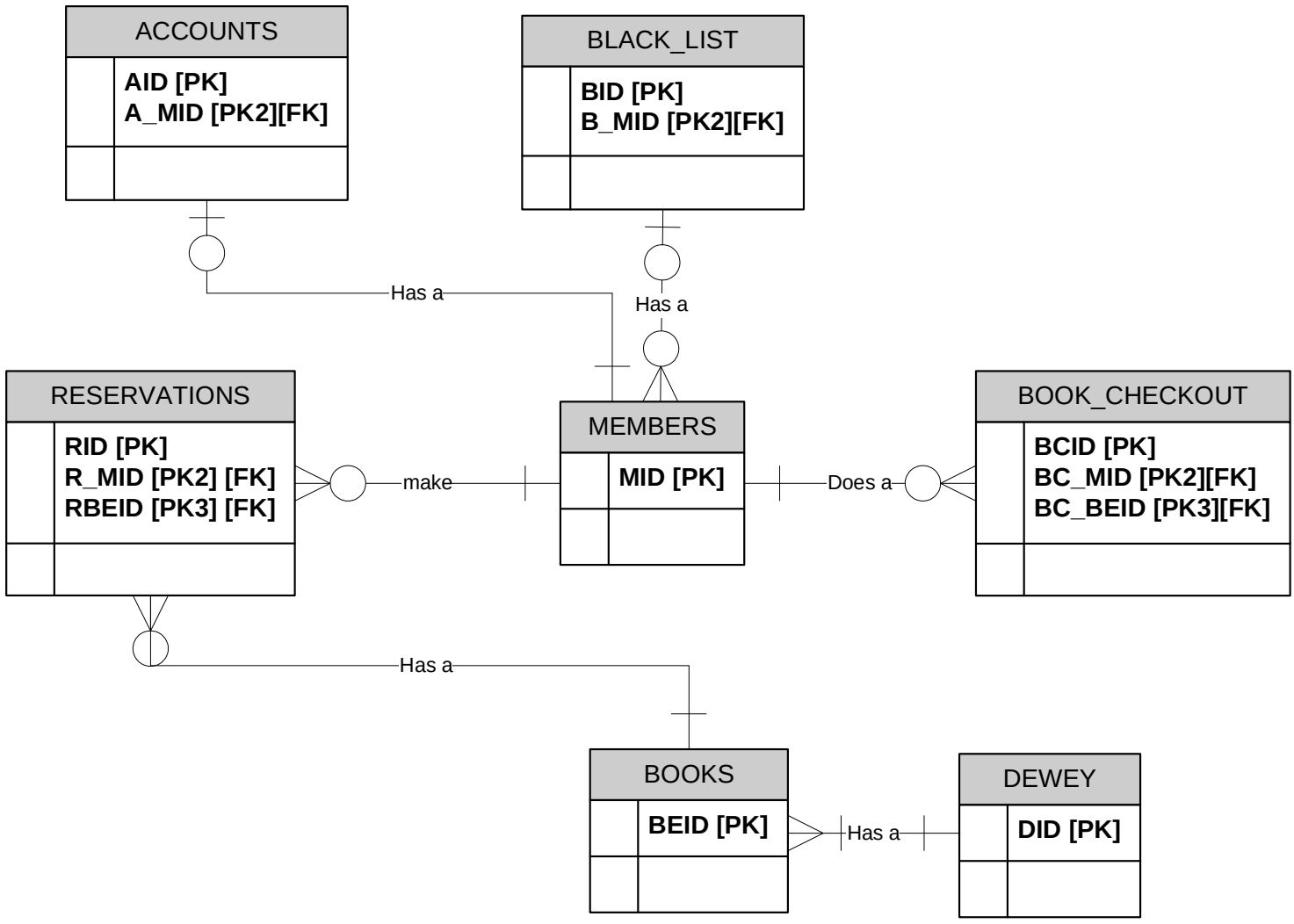
4.3.1 The Context Data Model



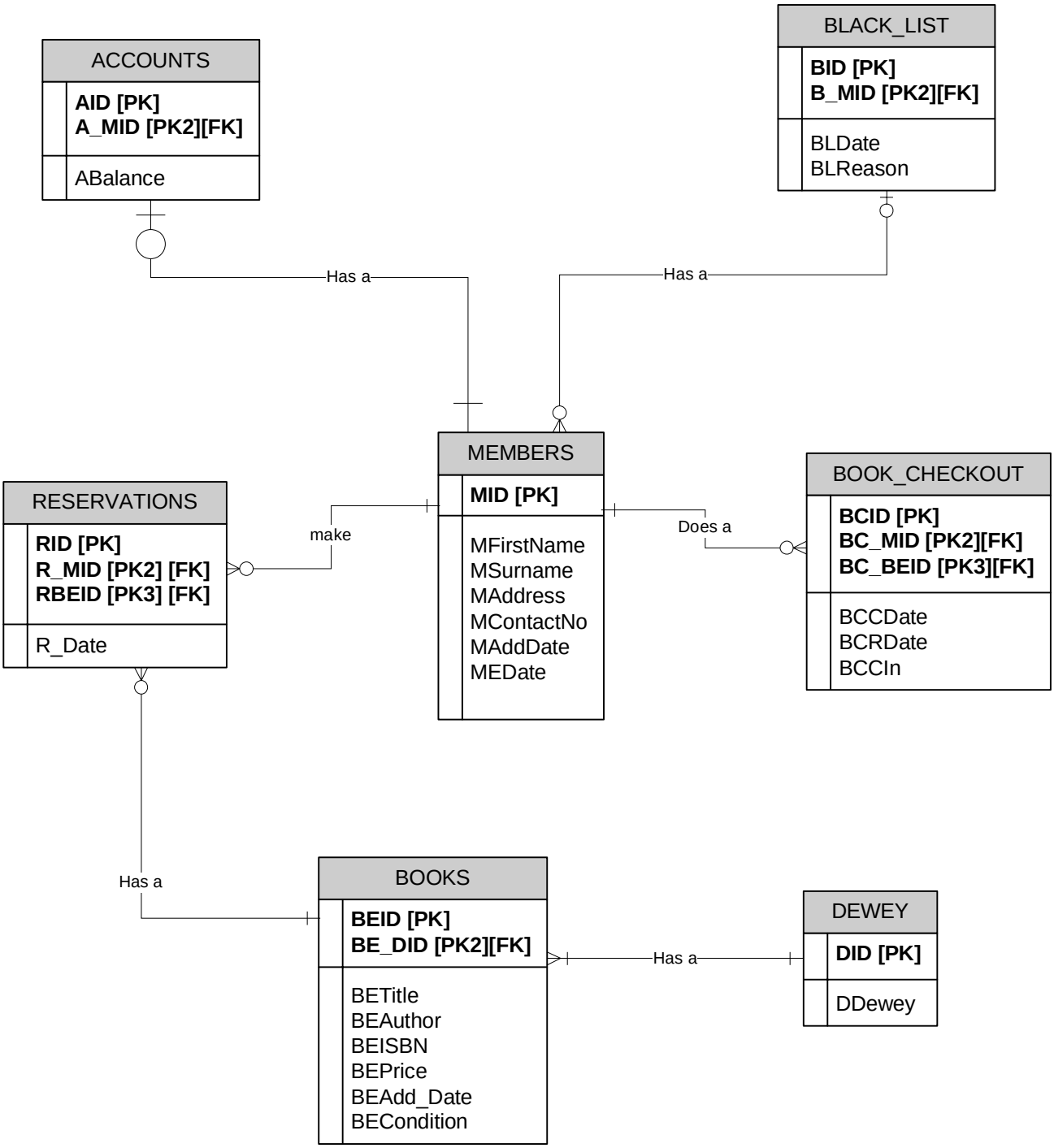
Business Rules

1. An account belongs to a member where a member has zero to one account(s). If a member is on a blacklist, his or her details as a member will still exists but he/she will have no account.
2. A blacklist has zero to one member(s) for there exists a case where there are no members on the blacklist. A member either is or is not on a blacklist.
3. A member does a checkout. A checkout has only one member.
4. A member can make one reservation per book. A reservation is made by one member.
5. A Book has zero to many reservations (reservations on a book). A reservation has a book.
6. A book has a Dewey decimal code.

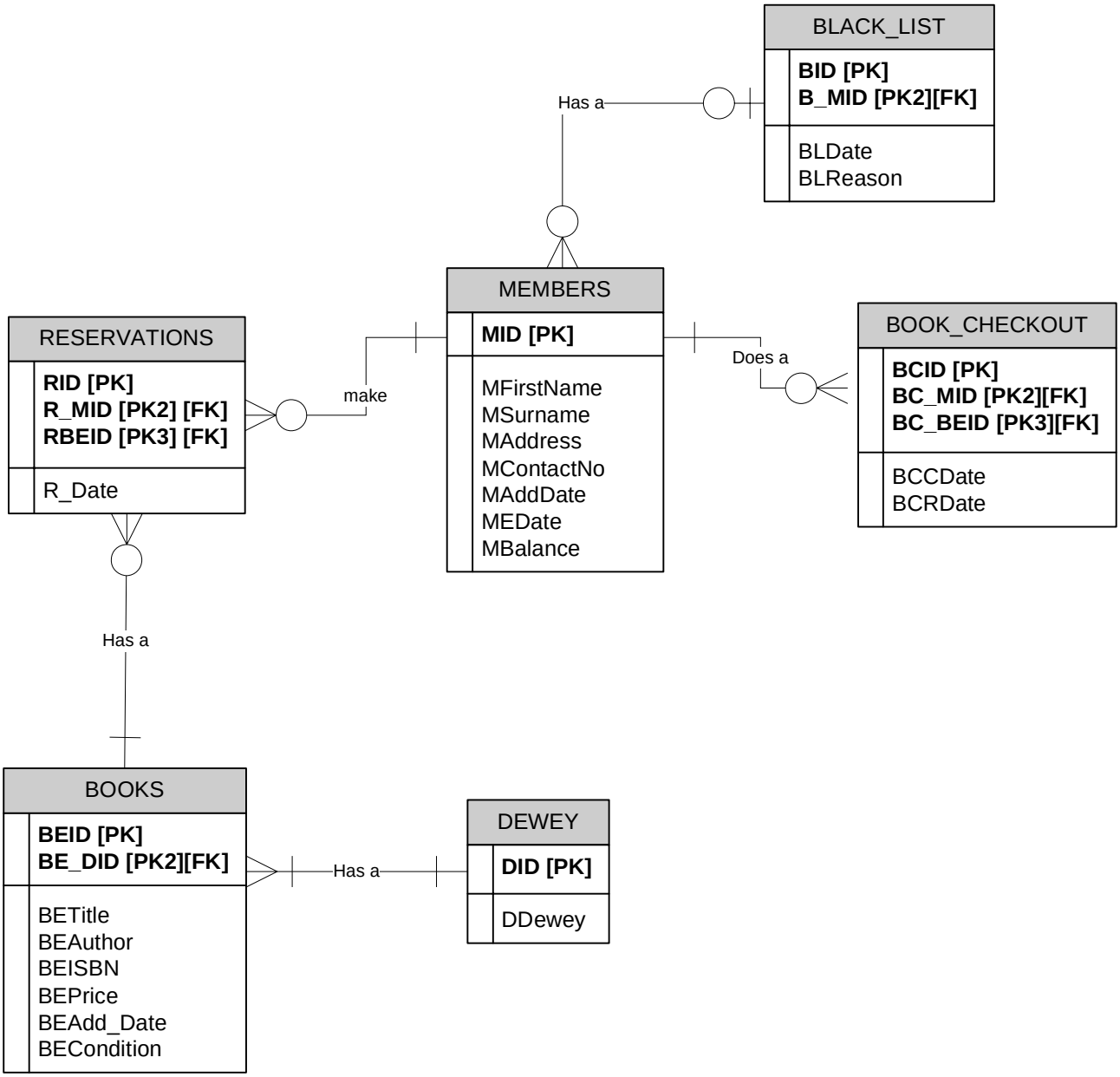
4.3.1 Key-Based Data Model



4.3.1 Fully Attributed Data Model

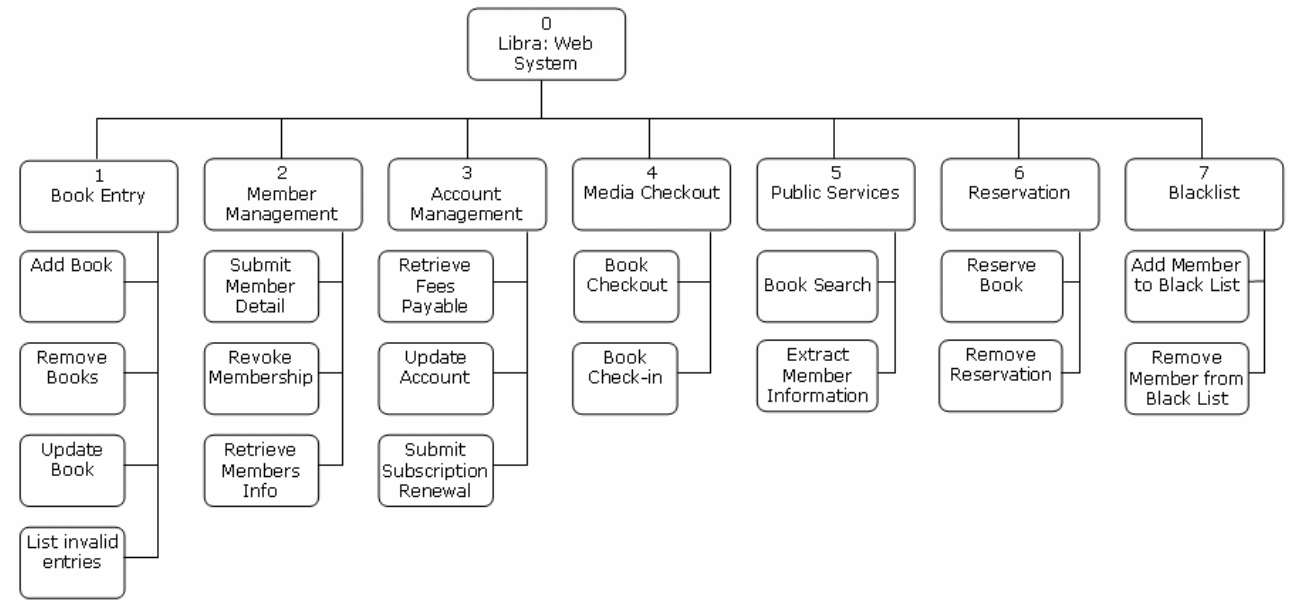


4.3.1 Normalized Data Model

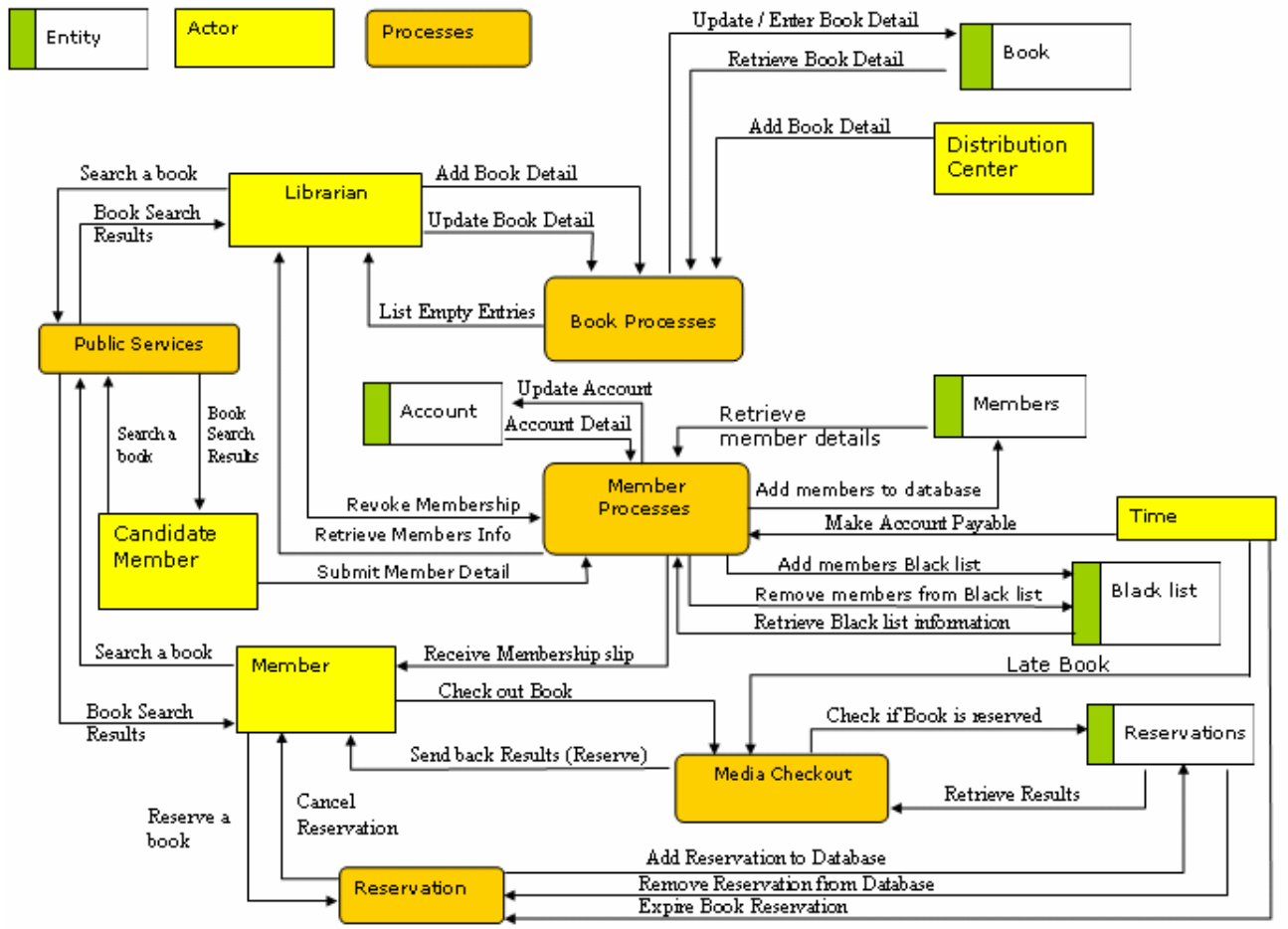


4.4 Logical process models

4.4.1 Functional Decomposition Diagram



4.4.2 System Diagram



4.5 Update project plan

Project progress report:

Summary of progress:

Scheduled analysis:
Since the completion of the previous phase, it has been found that the completion date has shifted to the 30th of May, and hence, the project is still on schedule. This phase ended on May 26th, 2005.

Budget analysis:
The project is still within budget. The total cost spent thus far is R600, which is less than the available limit of R1000.

The updated time schedule:
The schedule is shown on the next page.

5. Decision Analysis

5.1 Brief Introduction

During this phase, we will briefly evaluate the decisions prior to this section of the document. The reasoning behind the development of the new system will be examined, as well as the eventual feasibility of starting production of the new system.

5.2 Contents

5.3 The candidate solutions

Out of the many possible candidate solutions, the following were considered:

- A fully computerized system that handles all functions, sub-functions and sub-divisions of the library.
- A partially computerized solution that takes care of most of the information technology aspects.
- Keep the current system but add improvements to arrive at an optimal system.

5.4 Analysis and comparison of candidate solutions

The first solution was considered, and initially thought of as the ideal. This first solution ultimately failed, as a result of a number of constraints that were strictly monitored by the Library Committee. For example, the system may have cost four times more than the second solution, and even six times more than the third solution.

The third solution was immediately declined, because the current system can be considered only a stagnant remain of old technology, and as such, cannot adapt to the growing expectancies that modern technology demands.

The second solution, as was outlined and proposed in this document, was accepted and will be implemented into the following divisions of the library:

- Member division: this division takes care of the membership and account data, generally pertaining to the contact details and financial status of the library members.
- Book division: This division takes care of the book details and book types, for example, research books, children's books, fiction and non-fiction books, and so forth.
- Notifications department: This department takes care of the notifications to the system users.

This solution will need to make use of a database with entities as required.

5.5 Recommended solution

The recommended solution is the Partially Computerized System. It will cover the major percentage of the library system.

5.6 The next phase

The next phase of the project is the Physical Design phase. This phase will implement the logical models introduced in the Logical Design phase.

It will construct Physical Models to prepare for the actual design of the system in the later phases.

5.7 Conclusion

This phase has correctly identified the optimal solution for the proposed problem. The original objective, as stated in the Problem Analysis phase of this project, was to arrive at a system that automatically handles library functions, has thus been reached, and construction of the system can hereby begin. It has been decided to create the system from scratch, and not to implement any existing external programs.

5.8 Update project plan

Project progress report:

Summary of progress:

Scheduled analysis:
Since the project documentation has been completed within the projected time frame, a slack time of 3 days exists, and hence, the project is on schedule. This phase ended on May 30th, 2005.

Budget analysis:
The project is still within budget. The total cost spent thus far is R800, which is less than the available limit of R1000.

The updated time schedule:
The schedule is shown on the next page.