

SYSTEM REQUIREMENT SPECIFICATIONS



Intranet Facility

Submitted by:

**BIVAS DAS
AMRITAM SARCAR
SOURISH SENGUPTA
ISHAN CHAKRABORTY**

Pursuing

“BACHELOR OF TECHNOLOGY”
IN
“COMPUTER SCIENCE & ENGINEERING”

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

ST. THOMAS' COLLEGE OF ENGG. & TECHNOLOGY

(Affiliated to WBUT)

KOLKATA-700023

CONTENTS AT A GLANCE

1.	Introduction	4
1.1.	For Eyes Only	4
1.2.	A New Way of Working	4
2.	System Analysis	6
2.1.	General Description	6
2.2.	Defining the Problem	6
2.3.	Points to Ponder(PTP)	7
2.4.	A Detailed Look	7
2.5.	Feasibility Analysis	8
2.6.	What the system will offer?	9
3.	Design Issues For Intranet Facility	10
4.	Data Flow Diagram	11
4.1.	Level 0	11
4.2.	Level 1	12
4.3.	Level 2	13
5.	Entity-Relationship Diagram	18
6.	Database Design Details	19
7.	Sequence Diagram for Intranet Facility	27
8.	Use Case Diagram for Intranet System	28
9.	Algorithm for Intranet Facility	29
9.1.	Procedure Library Search()	29
9.2.	Procedure Sending Messages()	29
9.3.	Procedure Receiving Messages()	29
10.	Projected Screen Shots	30
11.	Work Plan	32
12.	Restrictions, Limitations and Constraints	33
12.1.	System Context	33
12.2.	Time	33
12.3.	Fundings	33

13.	Tools	34
14.	System Requirements	35
14.1.	Hardware Requirements	35
14.2.	Operating Systems and Platform	35
14.3.	Application Software Requirements	35
14.4.	Requirements for the client.	35

INTRODUCTION

An intranet shares most of the characteristics of the Internet, but in at least one way, it's fundamentally different. And just as the Internet has had profound effect on how we communicate, intranets have transformed the **business** world as well. Both Fortune 500 corporations and small **businesses** implemented this network infrastructure, improving productivity while reducing costs.

Just what is an intranet? Think of it as a mini-Internet designed to be used within the confines of a business, university or organization. What distinguishes an intranet from the freely accessible Internet, is that intranets are private.

1.1. For Eyes Only

Traditionally, corporations relied on proprietary hardware and software **systems** to network its computers, a costly and time-consuming process made more difficult when offices are scattered around the world. Even under the best of conditions, sharing information among different hardware platforms, file formats and software is not an easy task. By using off-the-shelf Internet **technology**, intranets solve this problem, making internal communication and collaboration much easier.

Intranets use **HTML** to create documents and **TCP/IP** to transmit information across the network. Information is stored on one or more company **servers** and accessed by using a web browser, such as Netscape Navigator or Internet Explorer. This self-contained, miniature Internet can have all the same features--individual home pages, newsgroups, e-mail--but access is restricted to employees and contractors.

For employees who are already familiar with surfing the Web, learning how to navigate the company intranet requires little training. Intranet web pages have the same point-and-click interface. While it's useful for an intranet to connect to the Internet, it's certainly not essential. Even if they do connect externally, companies restrict access to their intranet from the Internet by building a **firewall**. With so much corporate information available on internal **servers**, security is essential.'

1.2. A New Way of Working

Organizations thrive on information, yet access to it is not always easy to come by. People tend to rely on informal networking--the old "who do you know" routine. With an intranet, there is an enterprise-wide repository, an easy way to consult annual reports, benefits handbooks, schedule a conference room, locate an expense

report form, and review company vacation policies. This information is available 24 hours a day, seven days a week to anyone who has access, whether on the road, working at home or in a satellite office. No more waiting for the answer to a question as it slowly moves through traditional company channels. More sophisticated intranet features let employees fill out forms online, consult visual archives and order supplies.

The benefits and implications of an intranet can be enormous. For instance, many companies spend great sums distributing printed documents-- newsletters, handbooks, reports. Think about the printing costs alone, not to mention the environmental impact of all that paper. By making these documents available electronically, expenses are dramatically reduced. Another advantage is the ease of updating information. Corporate musical chairs render internal phone directories obsolete before they go to press. Once the directories are online, phone numbers can be changed with just a few keystrokes.



Beyond the bottom line, electronic document sharing promotes new ways to collaborate. No longer is it necessary to get everyone together in one room to discuss a project. Preliminary drawings, designs and data are shared online, via virtual meetings, with participants at their own desks, looking at a document and discussing it on the phone or with online telephony. Teams of people around the world can work together without incurring a dime in travel expenses.

SYSTEM ANALYSIS

2.1. General Description:

An intranet¹ facility is to be developed for an institution² such that the different sections³ can share information in an effective manner. This requires designing an information database-system, knowing institute specific conditions (eg. are diff. Facilities, size or strength of the people who will use the facility etc.). The project must therefore consider both the strategic and specific issues centered around building and managing the Intranet. The Facility thus created must meet a number of objectives or constraints that are forced on it by internal and external issues. The most important of these is to maintain a Facility that caters to the need of sending messages and receiving them, sending diff. notices and reminders. Its goal is to deliver an Intranet Facility that is both optimized and feasible (wrt database handling). To achieve this goal, it is mandatory to maintain adequate decision systems at each step and to properly schedule and work with the Database.

2.2. Defining the problem:

The overriding goal here is to ensure that *the Facility is both feasible and optimized such that the various constraints are met*. The user requirement must be stated explicitly. The users⁴ must at all times be able to use the facility effectively independent of the load.

The different facilities are discussed below:

- **OFFICE** – In this portal office workers would be able to post different notices in the website.
- **EXAM-CELL** – Here exam-cell workers would be able to post different recruitment drives, students selected etc. Others(not restricted users) would be able to view the general pages of this section.
- **LIBRARY** – In this portal people could search books, whereas members can view their borrowed books as well as fine.

¹ An **intranet** is a private computer network that uses Internet protocols, network connectivity, and possibly the public telecommunication system to securely share part of an organization's information or operations with its employees.

² college, school or university where regular classes are held to instruct students.

³ The different facilities incl. Office, exam-cell, library, student and faculty

⁴ any person who would visit the site.

- **STUDENT** – Students are allowed to have a personal portal where they would receive messages, send messages to Faculty and an option for Reminders.
- **FACULTY** – Faculties are allowed to have a personal portal where they would receive messages, send messages to Faculty and an option for Reminders.

2.3. Points To Ponder(PTP):

Distributing the facilities amongst different users must be done in accordance to all/some of the below mentioned points:

- 1) A student can only send messages(personal) to the Faculty.
- 2) Faculty can receive as well as send messages to Faculty and Student.
- 3) Notices can be given only from the Office.
- 4) Reminders can be set for a student or a faculty.
- 5) Department specific information can be viewed only from the designated site.

2.4. A Detailed Look:

When one looks at the whole system one can see a number of activities that can be related to the goal , as well as those that are not directly related. Those that are directly related include:

- Message sending & receiving, notices and reminders for faculty and students.
- View of general information of students and faculty and other facilities.

Activities not directly related to the goal may include:

- Effective handling of database in view of time and space complexity;
 - Upload and download facility; and
 - Data Security.
-
-

2.5. Feasibility Analysis:

There are a number of possibilities for meeting the goal determined in System Analysis. Not all of them use computers. For example, we may suggest the following:

- Employ an (external) agency to structure and hence develop the Intranet;
- Single-person (coordinator) managing the database; and
- Use manual work and not develop the “web” facility at all.
- Modifying the existing website to include intranet facility.

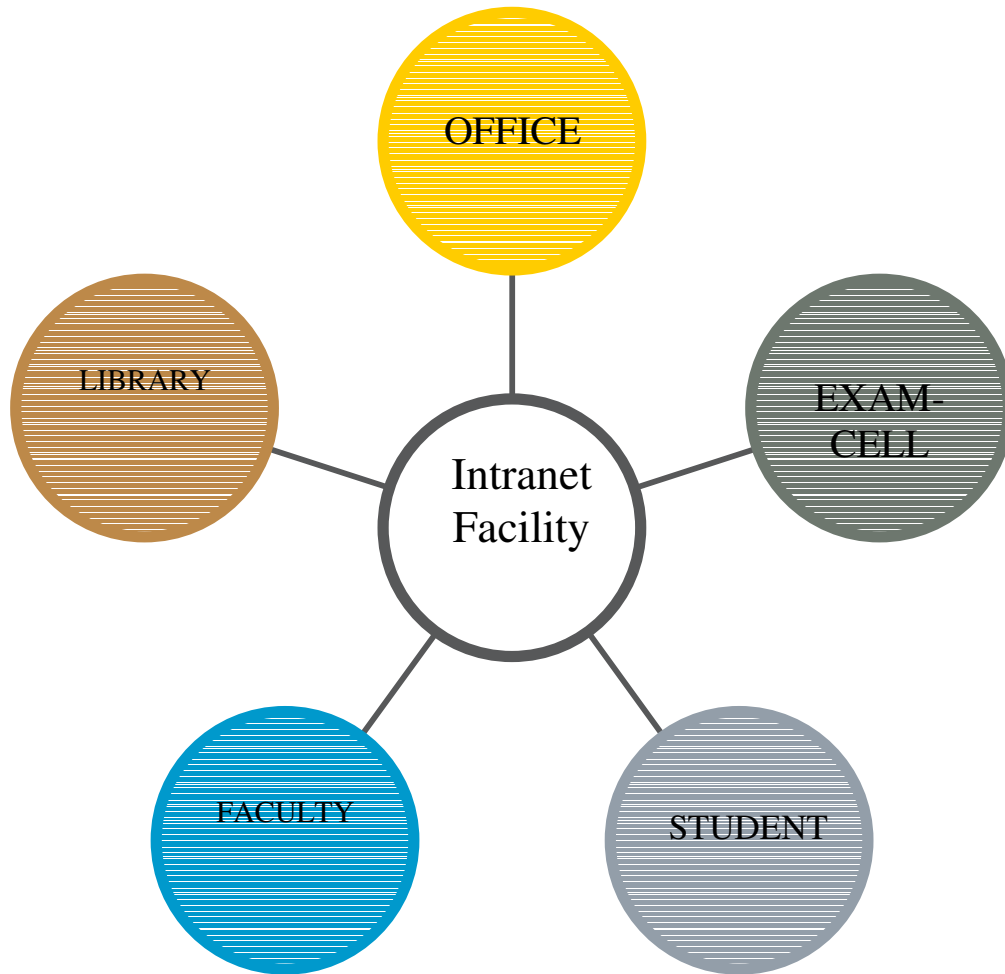
There is also, of course, a computer solution, especially that of using a standalone Software system. Here we might have a computer with a database that contains details of diff. constraints and information. Coordinator can enter information about the different specifications of the Routine. Users can browse through this database at any time to enquire about their Routine details through the computer. A more sophisticated approach would be to allow users to place different constraints(no. of messages, max. limit to notice s etc.) into the system stating their respective requirements.

Let us consider each of the possibilities in turn: The first option has an obvious financial constraint.It incurs an extra cost on a yearly basis. Only a single-person maintaining the database is obviously impractical and not feasible for a person to work with it. Modifying the Facility using an existing one is not a very practical solution. This is because the website(designed previously) will obviously fail to cater to the present need of the teachers. All of the above ways suffer from a basic problem: It is impractical for a human to work with hundreds of database information and their different constraints and then come up with a *complete working* solution.

The decision is made, in this case, to develop a web-enabled intranet facility for the above problem. The concept is then elaborated into a broad statement of user requirements, which is to support on-demand individual facilities. In detail, it requires:

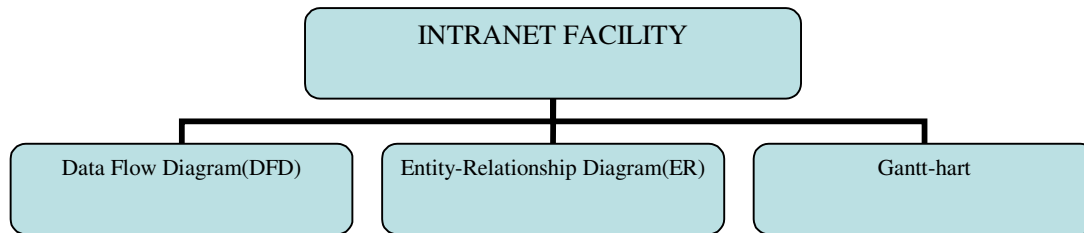
- direct entry of Personal Information of students and faculty into the database by the coordinator(or office workers);
 - users to be able to browse the database using pre-specified schemes;and
 - direct display of messages, notices and reminders for members.
-
-

2.6. What the system will offer?



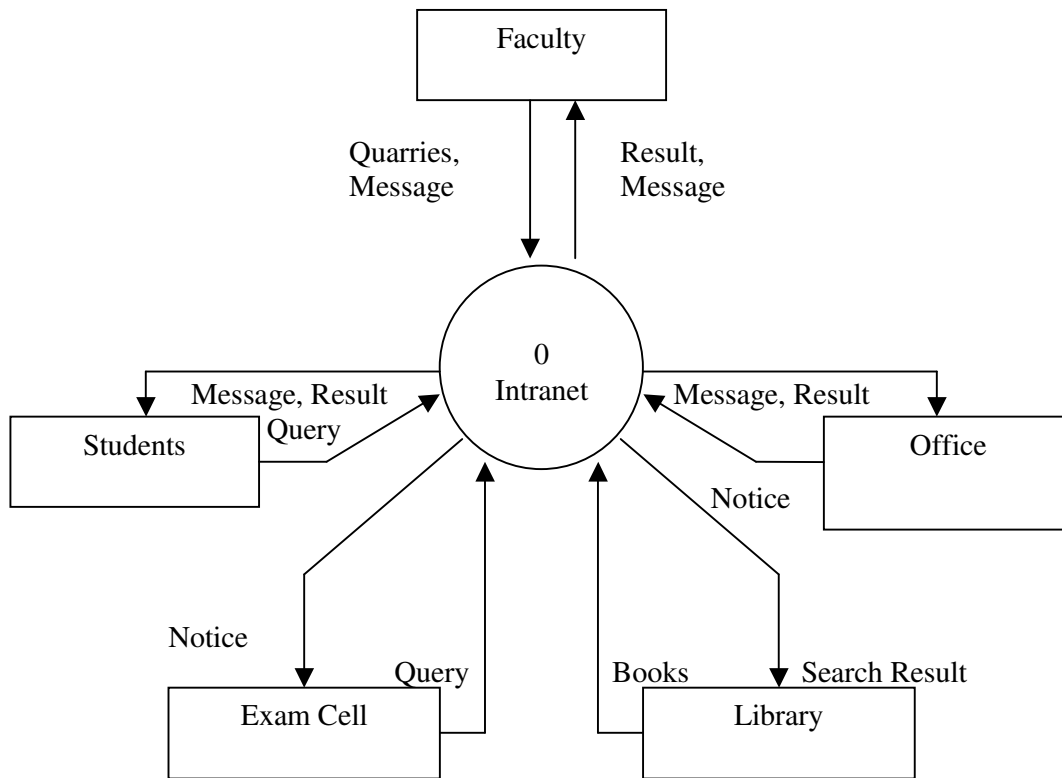
DESIGN ISSUES FOR INTRANET FACILITY

The design techniques that are used for the depicting the working of the different parts of the development can be broadly classified as per the following diagram:

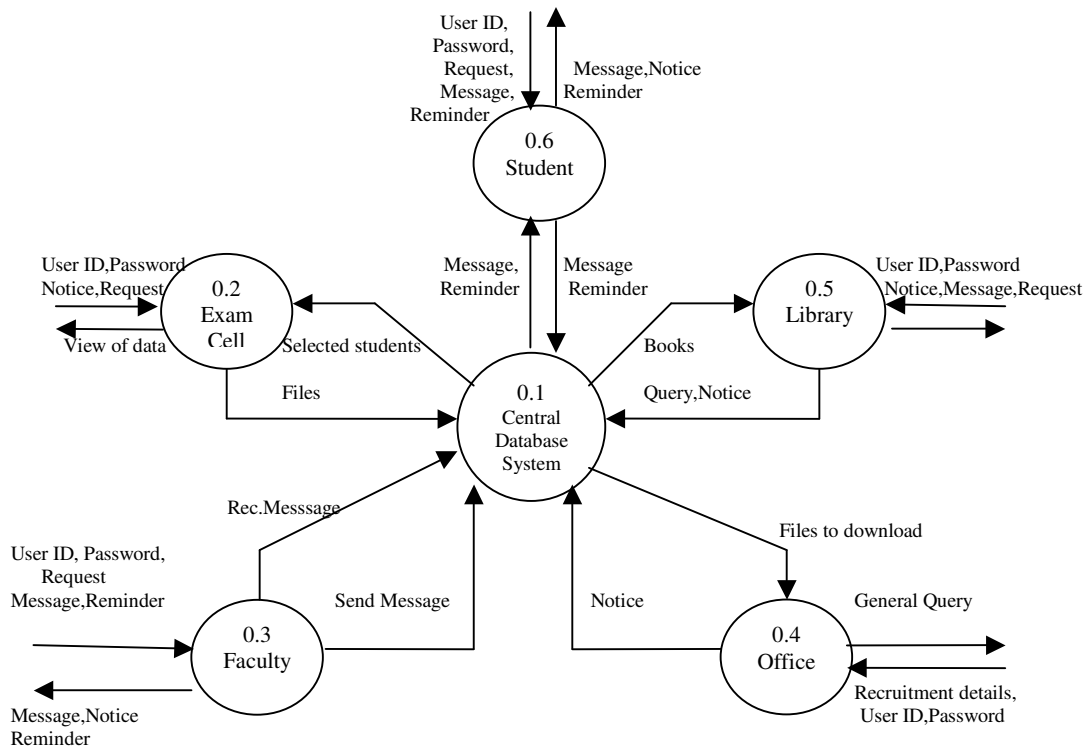


DATA FLOW DIAGRAM

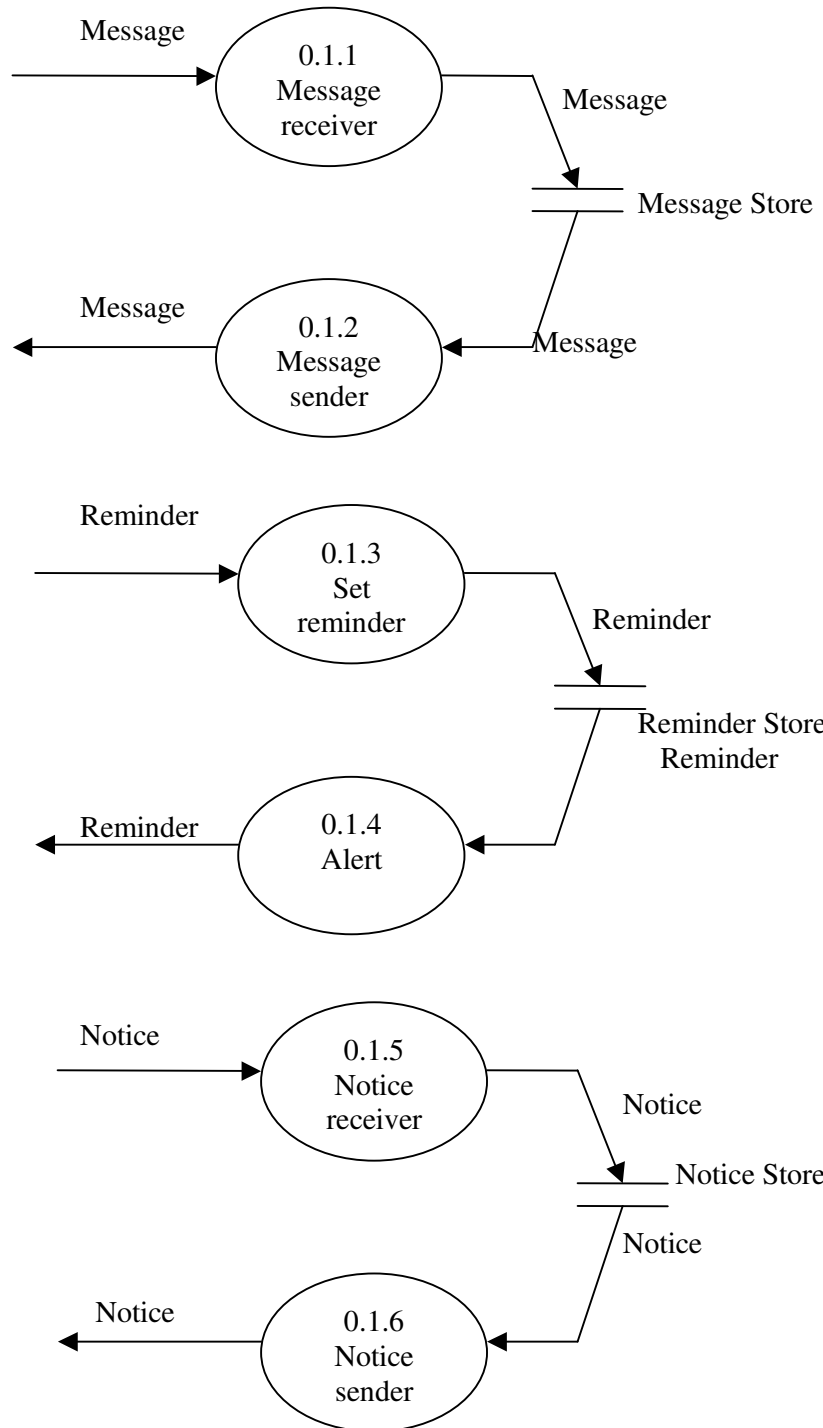
Context Free/Level-0

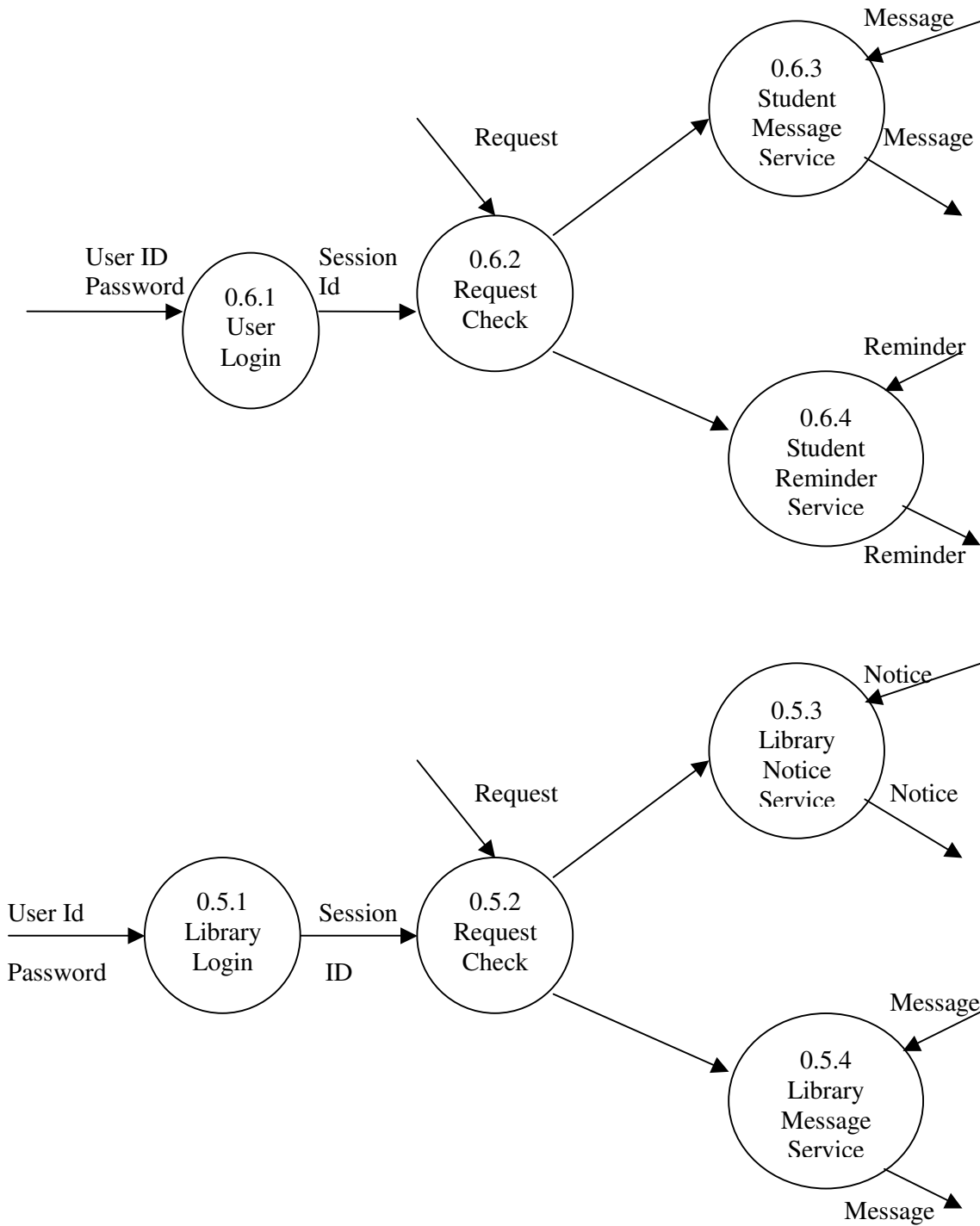


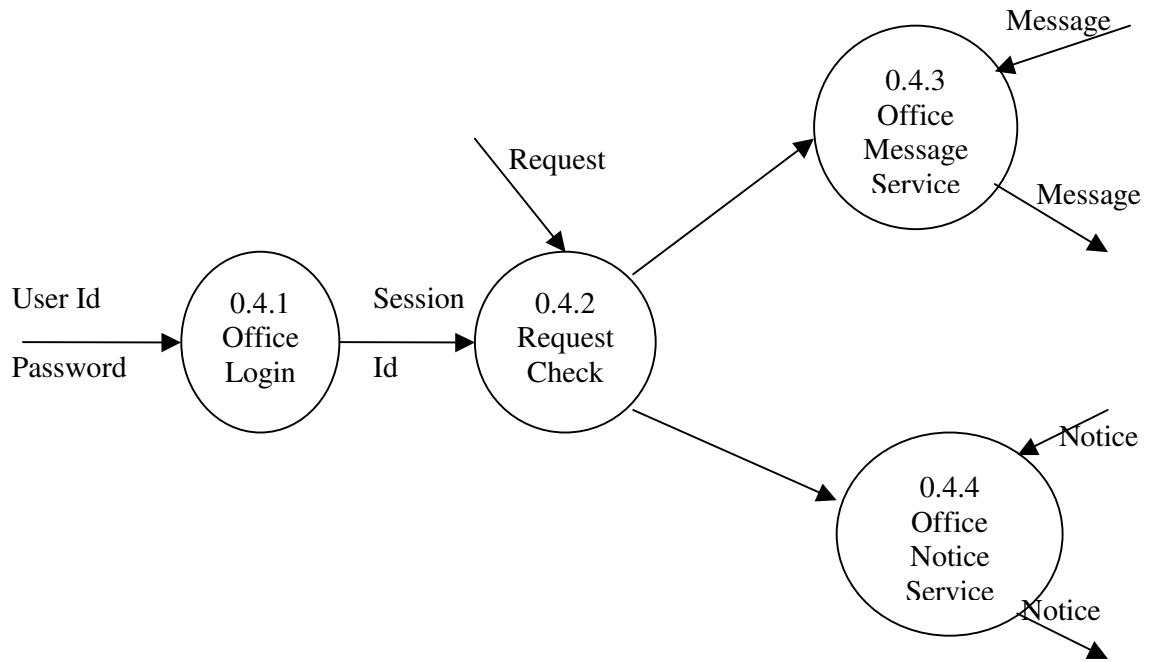
Level-1

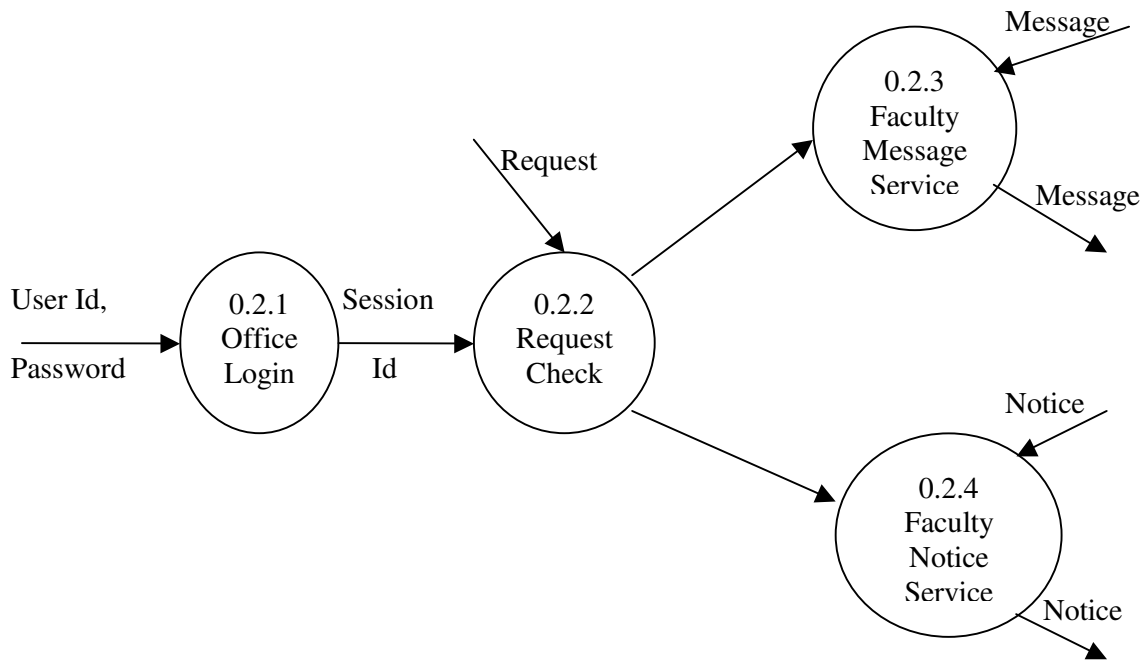


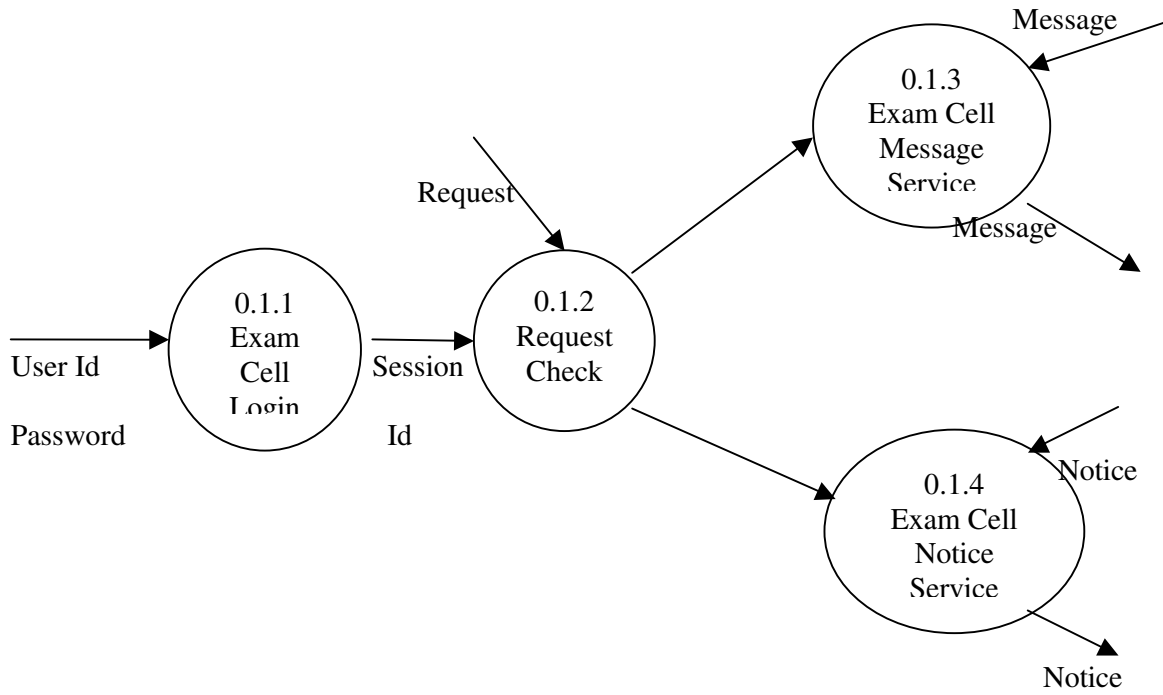
Level-2



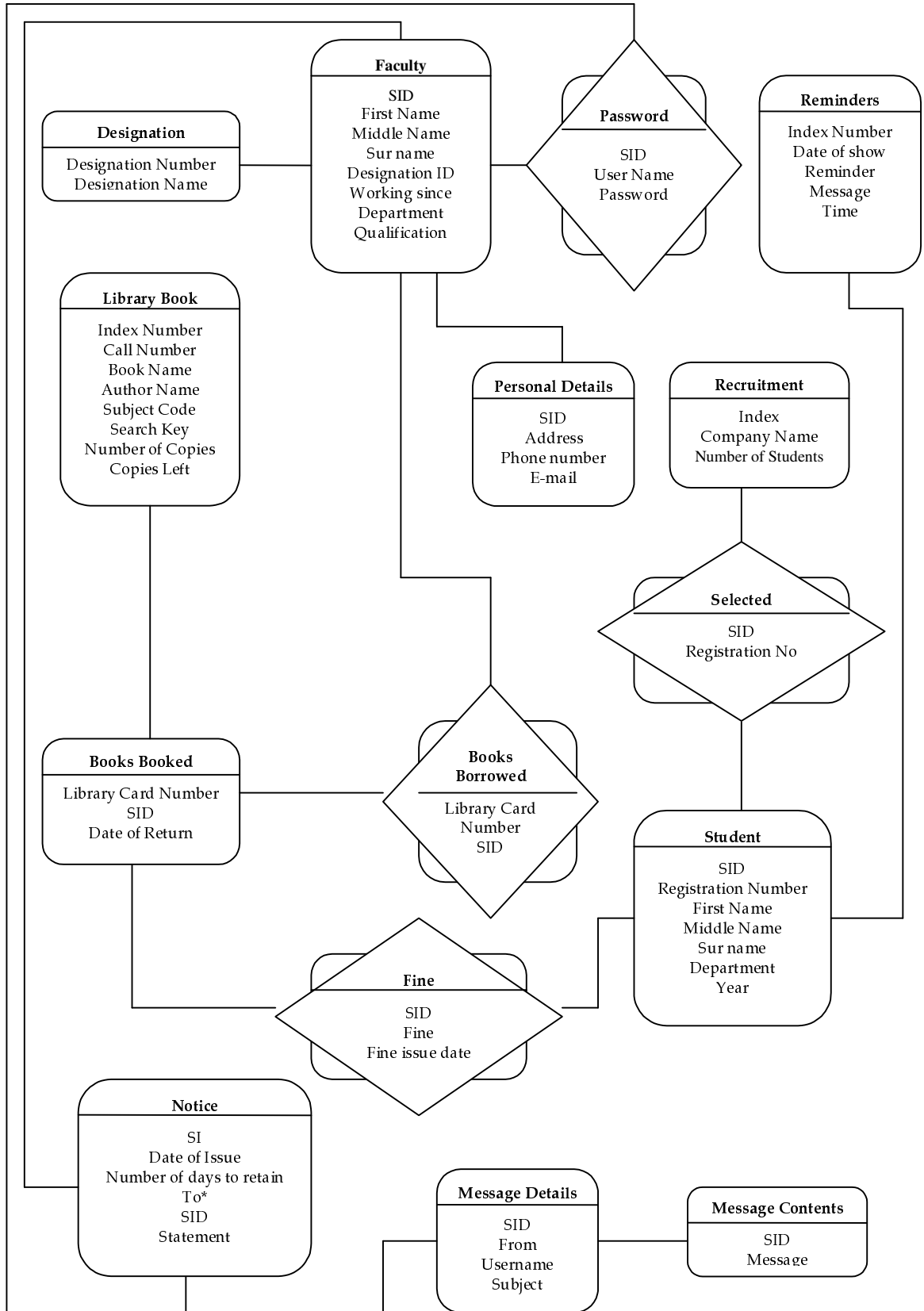








ENTITY-RELATIONSHIP DIAGRAM



DATABASE DESIGN DETAILS

FACULTY Table:

This table contain the details of the faculty.

Field Name	Field Type	Field Length	Key	Remarks
SID	Long Integer	50	Primary Key	Serial number
First Name	Text	50	-	First name of person
Middle Name	Text	50	-	Middle name of person
Sur name	Text	50	-	Sur name of person
Designation ID	Long Integer	50	Foreign key referencing to Designation table	This number is unique for every person.
Working since	Date	8 bytes	-	Day from which the faculty has joined.
Department	Text	50	-	Ending time of the institute
Qualification	Text	50	-	Enable/ Disable auto subject allocation

PASSWORD Table:

This table records the corresponding passwords with username.

Field Name	Field Type	Field Length	Key	Remarks
SID	Long Integer	50	Primary key, Foreign key referencing to Faculty table and Student table.	Serial number
Username	Text	50	Foreign key of first name of Faculty table and Student table.	The name that the user gives at the time of log-in
Password	Text	50	-	An encrypted text used for authentication.

REMINDERS Table:

This table contains the reminder details of the individuals.

Field Name	Field Type	Field Length	Key	Remarks
Index number	Long Integer	50	Primary key	Total number of reminders
SID	Long Integer	50	Primary key, Foreign key referencing to Faculty table and Student table.	Serial number
Date of show	Date	8 bytes	-	Date on which the reminder will be shown.
Reminder message	Text	50	-	The message string to be displayed.
Time	Time	8 bytes	-	Time of display of the message.

LIBRARY BOOK Table:

This table contains the book details for search facility. Every book is associated with all these facilities.

Field Name	Field Type	Field Length	Key	Remarks
Index number	Long Integer	50	Primary Key	Serial number
Call number	Long Integer	50	Primary Key	An unique number identifying the book
Book name	Text	50	-	Name of the book
Author name	Text	50	-	Name of the author
Subject code	Long Integer	50	-	Code of the subject to which the book belongs.
Search key	Text	50	-	A text used for searching the books.
Number of copies	Long Integer	50	-	Total number of copies available
Copies left	Long Integer	50	-	Copies remaining

STUDENT Table:

This table contains STUDENT information and details.

Field Name	Field Type	Field Length	Key	Remarks
SID	Long Integer	50	Primary key	Serial number
Registration number	Long Integer	50	-	This number is unique for every student.
First name	Text	50	-	First name of the person.
Middle name	Text	50	-	Middle name of the person.
Sur name	Text	50	-	Sur name of the person.
Department	Text	50	-	Department of the person.
Year	Long Integer	50	-	Year of the person.

BOOKS BOOKED Table:

This table contains the details of the various books that are allotted to the students.

Field Name	Field Type	Field Length	Key	Remarks
Library Card number	Long Integer	50	Primary key	Every person is allotted an unique library card number.
SID	Long Integer	50	Primary key, Foreign key referencing to Faculty table and Student table.	Serial number
Date of return	Date	8 bytes	-	Date on which the student is supposed to return.

BOOKS BORROWED Table:

This is a relationship table of STUDENT table and BOOKS BORROWED table. This table contains the information of student who has borrowed the book.

Field Name	Field Type	Field Length	Key	Remarks
Library Card number	Long Integer	50	Primary Key	This number is unique for every student.
SID	Long Integer	50	Foreign key referencing to Faculty table and Student table.	Serial number

FINE Table:

This table is a relationship table of STUDENT table and BOOKS BOOKED table. This table contains the fine details of the particular student.

Field Name	Field Type	Field Length	Key	Remarks
SID	Long Integer	50	Primary Key, Foreign key referencing to Faculty table and Student table.	Serial number.
Fine	Long Integer	50	-	Fine in rupees
Fine Issue date	Date	8 bytes	-	Date from which fine has incurred.

PERSONAL DETAILS Table:

This table contains the personal information of the students.

Field Name	Field Type	Field Length	Key	Remarks
SID	Long Integer	50	Primary Key, Foreign key referencing to Faculty table and Student table.	Serial number
Address	Text	50	-	Address of the person
Phone number	Long Integer	50	-	Phone number of the person
E-mail	Text	50	-	E-mail id of the person

NOTICE Table:

This table contains notice specifications.

Field Name	Field Type	Field Length	Key	Remarks
SI	Long Integer	50	Primary Key	Serial number
Date of Issue	Date	8 bytes	-	Date of issue of the book
Number of days to retain	Long Integer	50	-	Number of days that the notice will be displayed
To *	Text	50	-	To whom the notice is to be displayed
SID	Long Integer	50	Foreign key referencing to Faculty table and Student table	Serial nmbe of Student/Faculty
Statement	Text	50	-	The text or the message to be displayed

The attribute **To** contains a detailed information of where the notice would be displayed.

It is evident that the notices may be displayed in the main portal or to individual members or to a section of members. The different types are shown below :

For general notice SID is null.

Code	Purpose
GHO	General notice at home page
GFA	General notice at faculty page
GLI	General notice at library page
GST	General notice at student page
GEX	General notice at Exam Cell page

PFA	Personal message for faculty page
PLF	Personal message to faculty page from library
PLS	Personal message to student page from library
PST	Personal message to student page

This would be followed by a unique SID number.

MESSAGE DETAILS Table:

This is a relationship table that binds a teacher to the maximum classes per week he/she can take as per his/her status and designation.

Field Name	Field Type	Field Length	Key	Remarks
SID	Long Integer	50	Primary Key, Foreign Key referencing to Faculty table and Student table.	Serial number
From	Text	50	-	From which the message is send
Username	Text	50	Foreign Key referencing to First name in Faculty and Student table.	The name that the user gives at the time of log-in
Subject	Text	50	-	Subject of the message

MESSAGE CONTENTS Table:

This is a relationship table that binds the Routine no. to tacher and subject with their subject allocation for the present year.

Field Name	Field Type	Field Length	Key	Remarks
SID	Long Integer	50	Primary Key, Foreign Key referencing to Faculty Table and Student table.	Serial number
Message	Text	50	-	The text of the message

RECRUITMENT Table:

Table of information for different companies along with no. of students selected.

Field Name	Field Type	Field Length	Key	Remarks
Index	Long Integer	50	Primary key	This number is unique.
Company name	Text	50	-	Name of the company
Number of students	Long Integer	50	-	Number of students recruited in the company

SELECTED Table:

This table contains information about students who have been selected in campus interview.

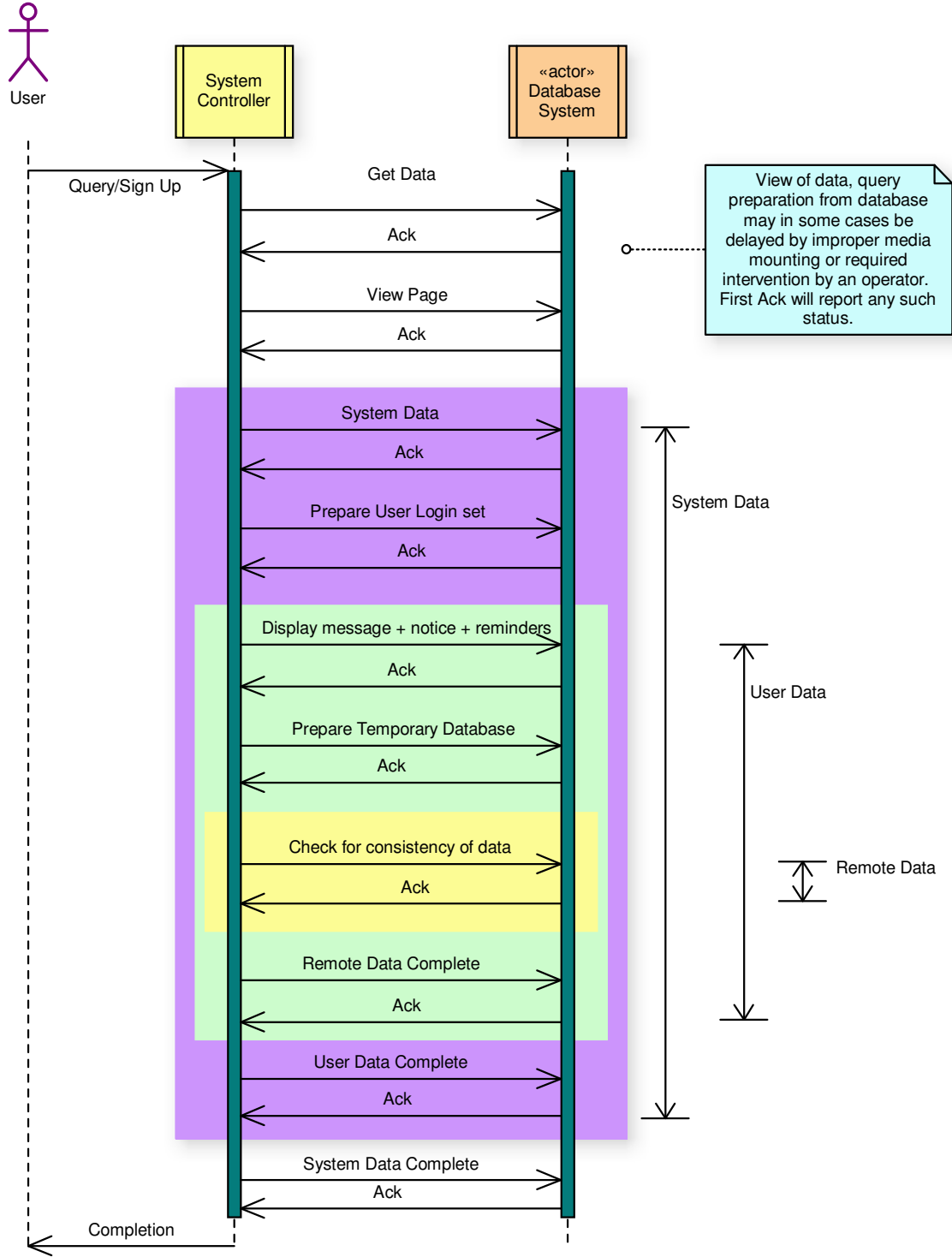
Field Name	Field Type	Field Length	Key	Remarks
SI	Long Integer	50	Primary key	Serial index
Registration number	Long Integer	50	Primary key	This number is unque for every student.

DESIGNATION Table:

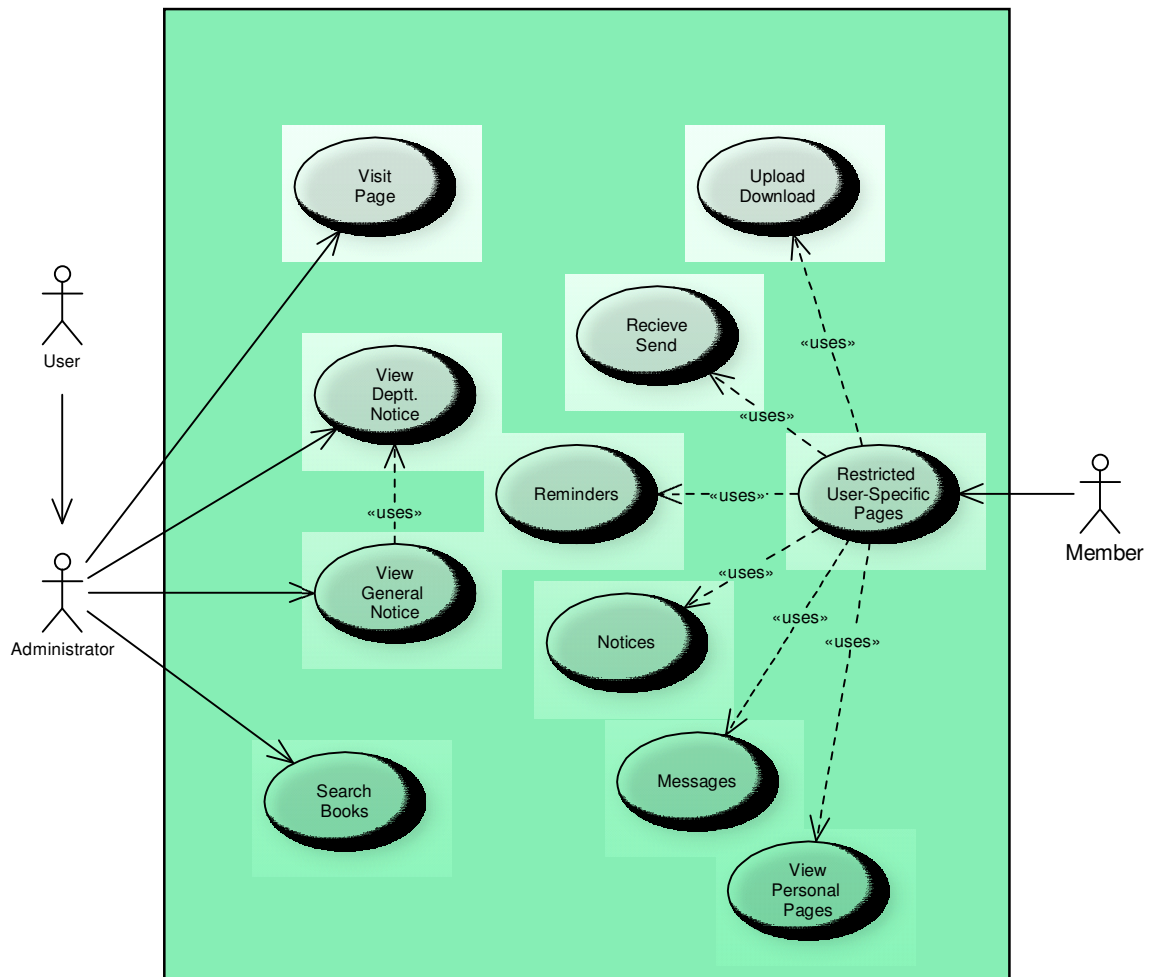
This table contains information about the various designations vis-à-vis its no.

Field Name	Field Type	Field Length	Key	Remarks
Designation number	Long Integer	50	Primary key, Foreign key referencing to Faculty table.	This number is unique for every designation
Designation name	Text	50	-	Name of the designation

Sequence Diagram Intranet Facility



Use Case Diagram Intranet System



ALGORITHM FOR INTRANET FACILITY

7.1. Procedure for Library Search():

- Step 1. Get input from user.
- Step 2. Detect whether search by name_of_book,call_no or string.
- Step 3. Retrieve information from Library Book Table.
- Step 4. Search the specified attribute corresponding to the search.
- Step 5. If found return true, Display else return false.

7.2. Procedure for Sending Messages ():

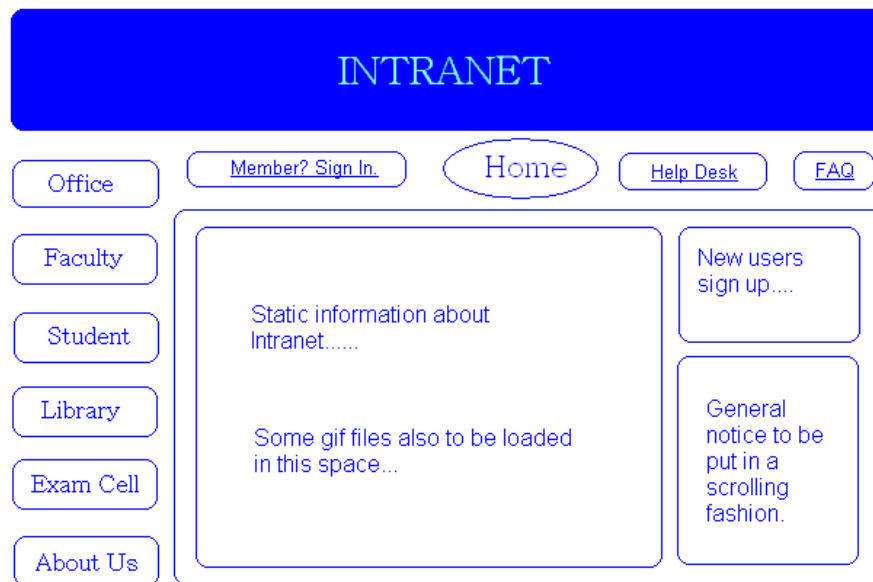
- Step 1. Check user authentication.
- Step 2. Read the message and store in the database table named Message.
- Step 3. Corresponding to the diff. Attributes save it in the database.
- Step 4. Check maximum limit if max. limit display error .

7.3. Procedure for Reciving Messages ():

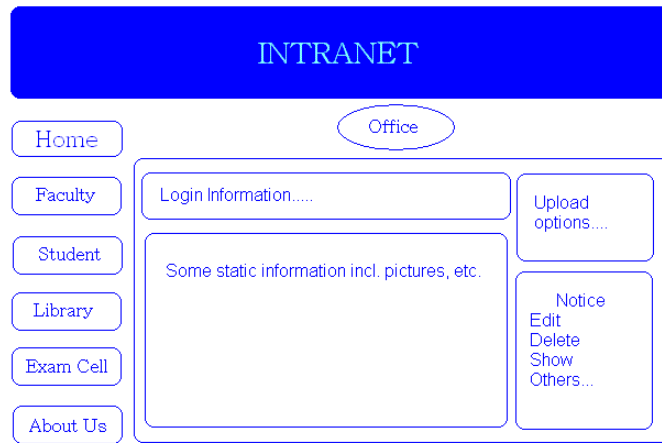
- Step 1. Check user authentication.
 - Step 2. Check for new messages. If present display else ignore.
-
-

Projected Screen-Shots

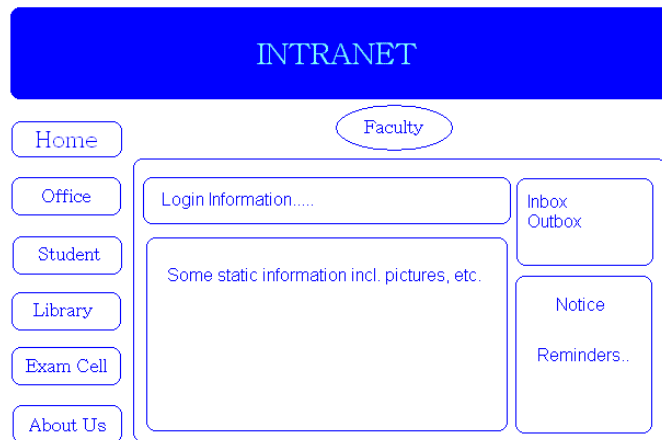
The screen shots that are being shown are not exclusive. It is just an idea of how the overall schema would look like. There is no guarantee that the same output would be shown in the final release of the software.



Main static page that is shown to all. It contains generic info



The main jsp based page that is shown only when a valid user is logged in
 The Library and Exam Cell page would look similar to the above page.



The Student page would look similar to the above page.

Restrictions, Limitations and Constraints

System Context

Eventually, multiple users will be using the product simultaneously. Therefore, concurrent connection will be an issue for implementation. In addition, this is a pilot product that hopefully, if successful, can be used in other locations as well. This leads to issues about future support for a larger user base.

Time

We only have about three months to finish all documentation, bug fixings and enhancements. We have a lot of ideas but cannot implement them due to time constraint. One of the major ones is to move the application to be completely browser-based.

Funding

To develop and implement the entire database system and set up a server, we will need funding to buy it. We will request the funding from our college should we decide to pursue this function.

Tools

We have decided upon GPL or GNU Public Licence. A legal scheme for creating more open-source software. For this *Java* Platform is chosen to be used as well as *MySQL*. MySQL and Java both are fast growing open source enterprise software development tools. More and more companies are using these as an alternative to expensive proprietary software stacks because of its lower cost and freedom from lock-in.

Java Servlet

Java Servlet technology provides Web developers with a simple, consistent mechanism for extending the functionality of a Web server and for accessing existing business systems. A servlet can almost be thought of as an applet that runs on the server side--without a face. Java servlets make many Web applications possi

Java Server Pages

It is convenient to use JavaServer Pages technology to rapidly develop and easily maintain information-rich, dynamic web pages that leverage existing business systems. The 2.0 release makes JSP technology even easier to use.

Apache Tomcat

Apache Tomcat is the servlet container that is used in the official Reference Implementation for the Java Servlet and JavaServer Pages technologies. Apache Tomcat is developed in an open and participatory environment and released under the Apache Software License. Apache Tomcat is intended to be a collaboration of the best-of-breed developers from around the world. We invite you to participate in this open development project.

MySQL

MySQL is a open source GPL based Database. It provides a "MySQL Community Edition" which is free to be used. MySQL is defining a new database standard. This is based on its dedication to providing a less complicated solution suitable for widespread application deployment. MySQL's robust database solutions embody an ingenious software architecture while delivering dramatic cost savings. With superior speed, reliability, and ease of use, MySQL has become the preferred choice of corporate IT Managers because it eliminates the major problems associated with downtime, maintenance, administration and support.

System Requirements

Hardware Requirements:

- Processor : Intel x86 or SPARC, Processing Speed 700 Mhz or higher.
- Memory : 128 Mb minimum, 256Mb or higher recommended.
- Disk Space required : 2 GB for Operating System, Application Server and Utilities. Recommended 5 GB of free Disk space.

Operating Systems and Platforms:

The Intranet Server we are developing are based on **Open Source Platform**, as well as these are also platform independent too. The Software required to prepare the server are available for any *Linux*, *Windows* or *Solaris* Platform.

Though we recommend the following operating systems to set up the server.

- Red Hat Enterprise Linux
- Solaris Enterprise System
- Windows Server System (i.e. Windows 2000 Server)

The basic reasons to recommend these systems are that they are highly flexible and secure in terms of running a server application like a Web Server.

Application Software Requirements :

To set up the Web Application Server the following applications need to be installed and configured properly.

- JRE 1.5 (or higher)
- Apache Tomcat 5.5.0 (or higher, supporting Java Server Pages 2.0 and JavaServlet 2.4)
- MySQL 5.0 (or higher)

Requirements for the Client :

There are no such specific requirements for the client except for the Internet Browser like Inter Explorer 5+ or Netscape 4.0+ The beauty of Java Server pages and Servlets is they generate static html pages. So the client can be residing on any machine using any web browser.
