

References

- [1] Sommerville, Ian (2006), Software Engineering, ISBN 81-7758-530-4, 7th Edition, pp 86.
- [2] Sommerville, Ian (2006), Software Engineering, ISBN 81-7758-530-4, 7th Edition, pp 89-90.
- [3] Sommerville, Ian (2006), Software Engineering, ISBN 81-7758-530-4, 7th Edition, pp 140.
- [4] www.en.wikipedia.org/wiki/Object-oriented_analysis_and_design
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Appendix A

Feasibility study

A.1 Economic feasibility

System requirements and cost of resources needed for development for the software product.

- Since the proposed system is planned to be developed using web technology, following types of web tools & scripts are used for this project.

Apache 2.2 web server

PHP 5.2.5 sever side scripting language

JavaScript – client side scripting language

HTML / DHTML / CSS technology

Those are open source and available under General Public License (GPL). Hence SLSI does not need to be spent on purchasing licenses for the development of the proposed computer software.

- MySQL 5.1 which is open source software is to be used as the database management system tool. SLSIS does not need to be spent on purchasing this tool.
- The proposed system needs at least 11 workstations (Three for administration division, ten for each division etc) and one server machine to provide required functionalities. All these computers are already available.
- This server machine is expected to be configured as Apache web server, My SQL database server, enabled to support PHP as a server side script. One dedicated machine required to carryout software development activities. As SLSI already holds these machineries, there is no need to spend on purchasing of these machines.

- All these workstations and server machines must be linked together through a computer network. A Local Area Network is already established by the organization.
- Internet & email facilities are required. The proposed system will utilize email facilities & to used as a learning facility to acquire necessary development knowledge, experience, and free version updates of Apache, PHP, MySQL etc. These email and internet facilities are already available.
- The whole system is expected to be developed by a single person. Hence the number of expected man days is calculated approximately as follows:

$$\begin{aligned}
 \text{No of Man days} &= \text{No of days per week} \times \text{No of weeks expected to spend} \\
 &= 5 \times (4 \times 6) \\
 &= 120 \text{ days}
 \end{aligned}$$



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- Training and awareness programs will be given at no cost before acceptance test is carried out. Before acceptance test is carried out, training & awareness program will be given to the end users. This training & awareness program will be arranged at SLSI premise and it will expected to be scheduled the awareness program for all end users and training will be given separately for each employee. There will be a 45 minute awareness program in common and the training program will be limited to 2 hrs. This time may be subjected to change as and when needed.
- Given the consideration for above systems requirements, the proposed software system will be developed and deployed without any cost to SLSI

A.2 Technical feasibility

A.2.1 Development risk

The development risks with respect to this software development project will be addressed under the following types of risks with describing ways of reducing or eliminating those risks.

Project risks

1. Schedule slips

The reason for not meeting the due project completion date is the under estimation of project completion. This will largely depend on the developers experience and skill.

Another reason that would lead to this type of risk may also be the learning curve in technological aspects of MySQL, PHP, Apache etc.

The way of reducing the risk: The total software can be released as small cycles. That is large project is split into manageable small cycles. In each cycle something that is of value to the SLSI is implemented. SLSI is allowed to decide which features are to be implemented first and which all are to be postponed to the end. Thus even if the project is getting late, the most important and valuable parts would be working.

The developer will learn more about the technical aspects of MySQL, PHP, and Apache etc with the help of Internet and from the industrial experts who have connection with SLSI. The top management of SLSI has already decided to provide free technical assistant to the developer through industrial expert if such assistant is needed.

2. Hardware / Software failures

There is a possibility that the computer hardware / software used for the software development project may be damaged or corrupted or rendered unusable at any given time due to any reason.

The way of reducing the risk: In a case of application software or open source software tool failure or corruption, it can be recovered by re-setting or re-installing. In a case of computer hardware failure, it can be rectified by the help of IT Unit of SLSI. If a serious hardware issue is found, a lone computer may be requested from SLSI side until the original one gets ready for use.

Product risks

3. Size underestimation

The size of the system to be developed has been underestimated due to lack of experience.



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The way of reducing the risk: This can be overcome with having consultation with an expert in the area of software development.

Organizational risks

4. Unacceptability of the software product by the employee of SLSI

Here we consider the risk that may arise from SLSI work environment with introducing of the proposed software system. Some employees may feel that they will be badly affected by the proposed system. They may feel uncertainty of their jobs. Therefore they may organize to refuse or roll back the system. . .

The way of reducing the risk: therefore employee awareness program can be organized at SLSI premise to educate and convince the importance and the use of the software product.

A.2.2 Resource availability

Hardware & software

Software: following types of software tools and languages are available with SLSI.

<i>Software Item</i>	<i>Remarks</i>
Apache 2.2 branch web server	Open Source
MySQL 5.1 database management system software	Open Source
PHP 5.2.5 server side scripting	Open Source
JavaScript client side scripting	Open Source
HTML / DHTML / CSS	-
Supporting software	
MS Windows server 2003	Licensed
MS Windows XP professional 5.1 for the clients	Licensed
Rational Rose software for design activities	Not License
MS word for preparing documents	Not License
MS Power point for presentation	Not License
Adobe photo shop CS 2 for graphic preparation	Not License
Macromedia Flash for animation	Not License

Hardware: SLSI currently has the following computer hardware.

Division	Computers	Operating System
Administration Division	06	Win XP
Systems Certification Division	10	Win XP
Other divisions	120	Win XP

Server: Two IBM Netfinity 3000 servers – Primary Domain Controller and Backup server.

Computer dedicated to development purpose:

- Intel Pentium 4 CPU – 3 GHz

- 512 MB RAM
- 80 GB

A.2.3 Technical know-how

The developer has theoretically sound knowledge related to software development process, and practical experience in developing real systems using the technologies such as MS Access, SQL Server like database management software and Visual Basic, Java like programming languages. The developer has already showed his ability to the SLSI by developing and implementing a software system for Inventory Control & Purchase Order System for SLSI. So, this exposure will be definitely helpful to developer to proceed the development activities with confidence even though the developer is new to web technology. Following types of technical knowledge has been obtained by the developer in the MSc in Information Technology in IT Faculty of University of Moratuwa.

Technical know-how

Apache 2.2 web server

MySQL 5.1 database management software

PHP 5.2.5 server side scripting

JavaScript client side scripting

Rational Rose software for design activities

Adobe photo shop CS 2 for graphic preparation

Macromedia Flash for animation

HTML / DHTML / CSS

Object oriented analysis & design

Software project management

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A.2.4 Technology use

Today there are so many sophisticated software systems have been developed based on web technology all over the world. The technology we use here are falls under open source software. We can get new updates freely on internet and also possible to get technical support easily. The proposed system would be developed according to the user requirements and to the given time constraints with the following development environment.

- **Development environment**

Apache 2.2 web server

MySQL 5.1 database management software

PHP 5.2.5 server side scripting

- **Operating systems**

Windows 2003 server, Windows XP professional

- **Designing tools - UML, Object oriented analysis and design**

A.3 Legal feasibility

A.3.1 License

Since the open source software which comes under general product license category are planned to be used for the development of the software product as well as software deployment, there is no need to spend on purchasing licenses from the vendors. The new updates and technical support are also free and available in web.

A.3.2 Agreement

The proposed system will be developed as per the mutual understanding between developer and SLSI.



A.3.3 Confidential documents

All the confidential documents owed to the SLSI will not be disclosed without getting prior approval from SLSI and those documents will be securely kept under controlled environment. These documents may include followings:

- ❖ Company procedures
- ❖ Company manuals
- ❖ Forms, formats
- ❖ Check lists
- ❖ Test results and test data
- ❖ Process flow charts
- ❖ Report formats
- ❖ Etc.

These confidential documents and data owed to SLSI will be handed over at the movement of the sign-off the project.

A.4 Cost benefit analysis

No any cost to develop the proposed software system.

Intangible benefits

1 Reduced manual intervention, save time, increase effectiveness and efficiency

It saves lot of man-hours and this can be used for other productive activities. There is a big opportunity to reduce unnecessary work flows and save time with the introduction of computerized Personnel Information. Thus managing of its personnel information is easy, effective and efficient.

2. Unnecessary information redundancy and data inconsistency

Since there is a central data repository and other systems can share these data then the information redundancy and inconsistency can be over come.

3. Support for fast and reliable decision making

Since it is easy to find and monitor the activities and information regarding personnel records in the proposed system, decision making process is fast, short and realistic as

the system ensures the security of the information. For example, SLSI provides its employees internal and external training / foreign scholarships. When selecting suitable candidates it is needed to have all the past records regarding trainings/scholarships provided to employees. This information can be accessed very few second by the proposed system.

4. Fast and easy access and retrieving to employees' past data

In the proposed system, it is easy to access and retrieving past/history information when management requests. So it will save unnecessary time to preparing reports etc.

Since all the information is kept in a central place and data is saved and maintained in a proper manner, searching information is very fast as the required searching facilities have been built into the proposed system.

5. Reduced lots of paper works and file storage.

By introducing the proposed system, lot of manual paper works are reduced. Only few required forms and formats are kept within the files. So the file storage is heavily reduced. This is considered as a tangible benefit also.

A.5 Alternative systems



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A.5.1 Alternative systems options

The following types of alternative systems can be proposed.

Option 1 – Multi user environment using web technology

In a Multi user environment using web technology, any authorized users can access and use the system simultaneously via the local Area Network which has already been established. High security of the system is a distinct advantage over a web base system since there is no connection with out side world. It is not connected to internet. Therefore there are no threads from intruders via internet. Another advantage is the easy maintenance and scalability.

Option 2 Web based system

Among the advantages, multiple users can log-in to the system at the same time via internet. Scalability and maintainability are also easy. Since a web site for SLSI has already been established, the proposed system can be developed with connecting to that web site.

The biggest disadvantage is the high risk of security threads. Introducers would try to breathe the security measures of the system.

Option 3 – Multi user environment without using web technology

In a Multi user environment without using web technology, any authorized users can access and use the system simultaneously via the local Area Network which has already been established. Security measures can be taken since there is no connection with out side world. It is not connected to internet. Therefore there are no threads from intruders via internet. But the disadvantage is not easy maintenance and scalability with compared to other options mentioned above.

A.5.1 Selected alternative system

Having considering the need to access the software system by any user at the same time at different locations in the same land, easy maintainability and scalability capabilities of the software system, and specially the security concerns, I recommend selecting the *option 1*.

Option 1 – Multi user environment using web technology

Activity diagrams and use case descriptions for the existing system

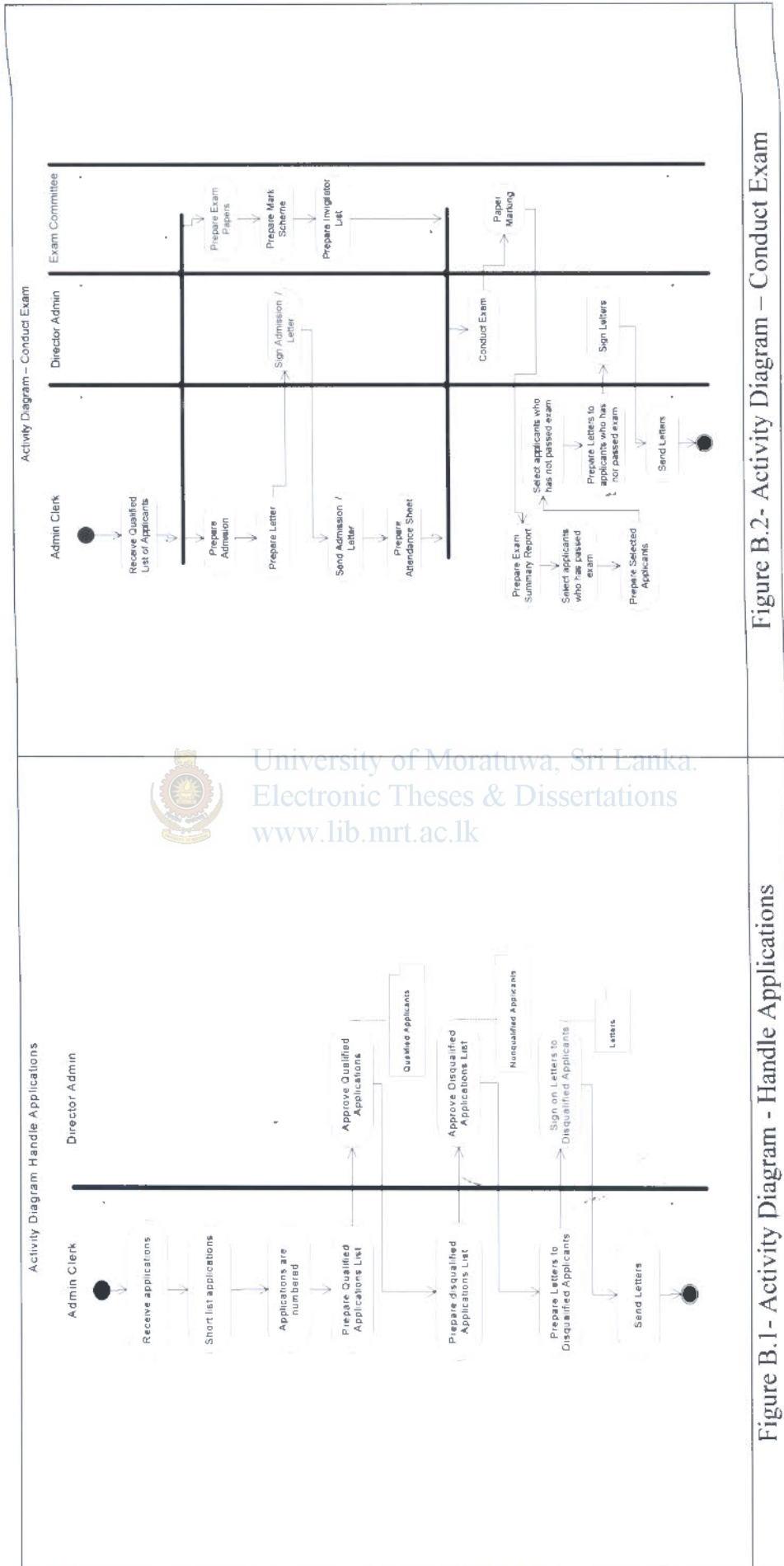


Figure B.2- Activity Diagram – Conduct Exam

Figure B.1- Activity Diagram - Handle Applications

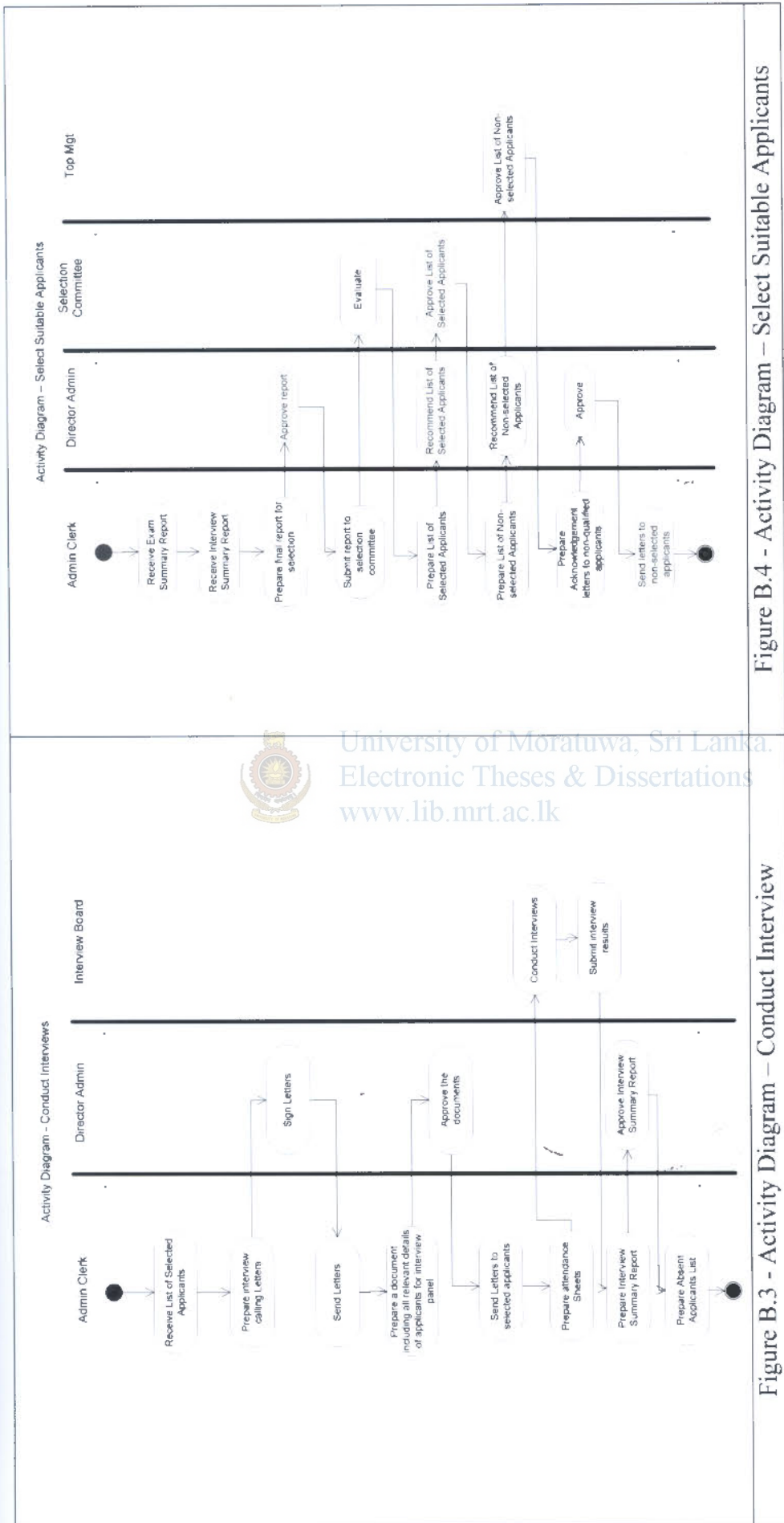


Figure B.3 - Activity Diagram – Conduct Interview

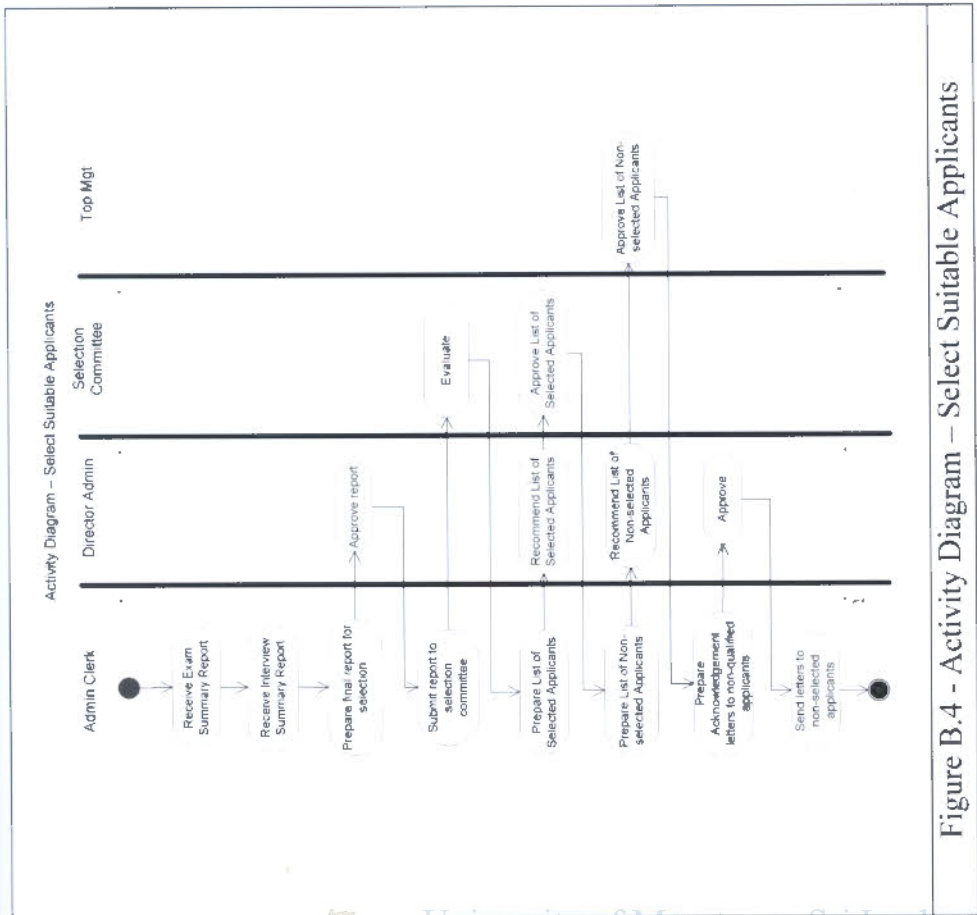


Figure B.4 - Activity Diagram – Select Suitable Applicants



Activity Diagram – Handle New Appointments

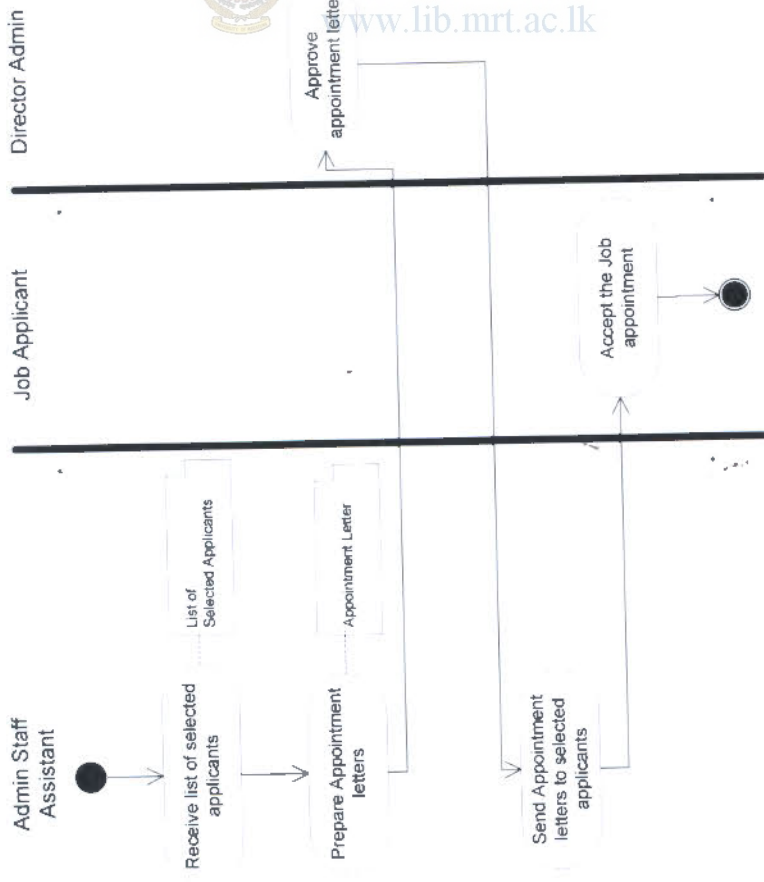


Figure B.5 - Activity Diagram – Handle New Appointments

Activity Diagram – Keep Personnel Information

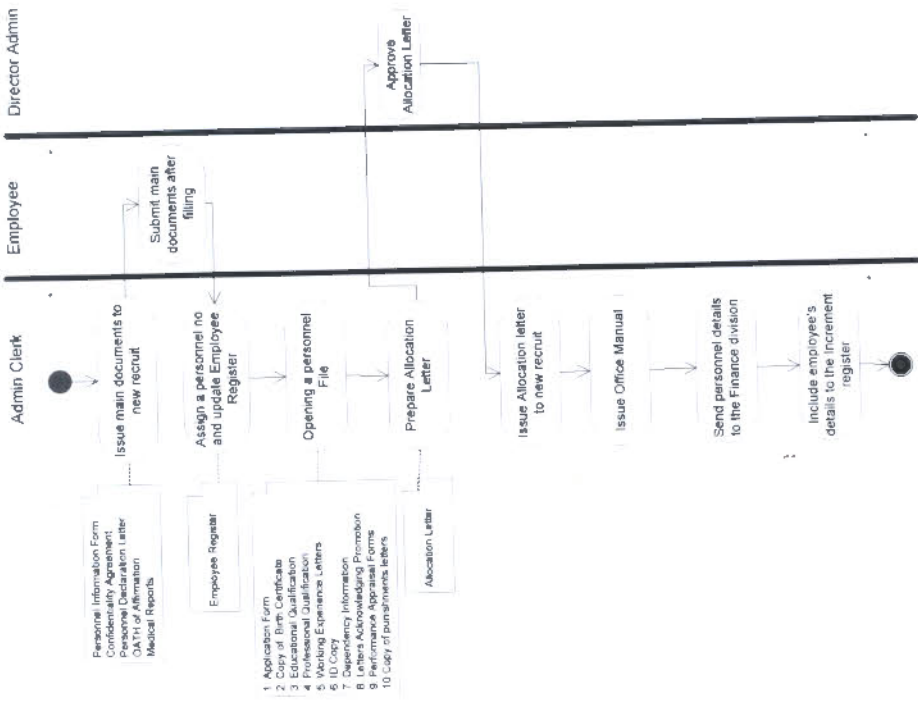


Figure B.6 - Activity Diagram – Keep Personnel Information

Activity Diagram – Assign EPF No

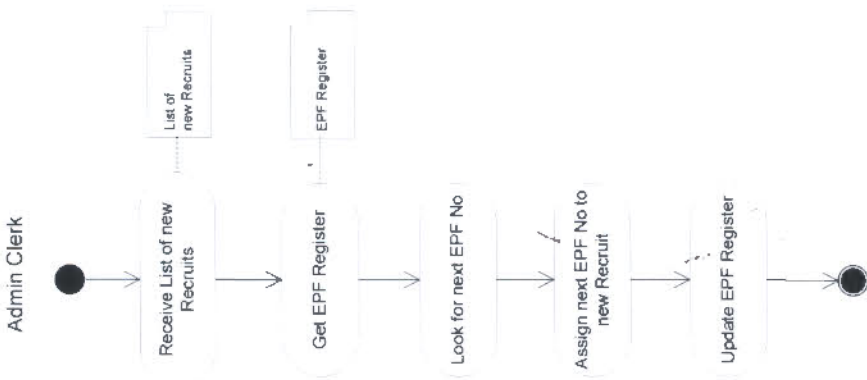


Figure B.7 - Activity Diagram – Assign EPF No

Activity Diagram 3 – Complete EPF Forms

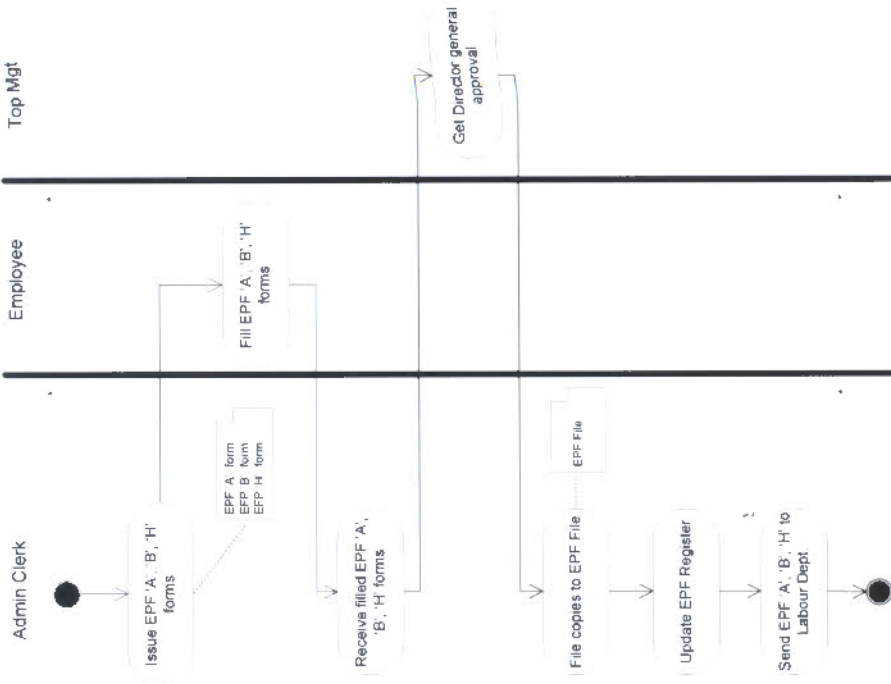


Figure B.8 - Activity Diagram – Complete EPF Forms



Use Case Description - Advertise Vacancies

Use Case Name	Advertise Vacancies
Description	This use case details the steps required up to advertising of vacancies once vacancies have been identified.
Actors	Admin Secretary, Top Mgt, Director Admin, Admin Clerk
Pre-Conditions	The Man Power Plan is available.
Post-Conditions	Relevant paper advertisement has been published in News Papers.
Flow of Events	<ul style="list-style-type: none"> ✓ Identify Vacancies from Man Power Plan ✓ Prepare a document including Vacancy details ✓ Decide whether a new Recruitment or Promotion ✓ If the vacancies can not be filled by internal promotion, Decision is made on to have new recruits. ✓ Prepare a request letter to have ministry approval ✓ Letter is signed and forward to Ministry ✓ Receive Approved Letter ✓ Request to prepare relevant Advertisement ✓ Prepare Advertisement ✓ Approve Advertisement ✓ Send for paper advertisement
Exceptions	<ul style="list-style-type: none"> ✓ If the vacancies can be filled by internal promotion then promotion activities are carried out.



Table B.1 - Existing System - Advertise Vacancies Use Case Description

Use Case Description - Handle Applications

Use Case Name	Handle Applications
Description	This use case details the steps of selecting suitable qualified applicants who have applied for the job vacancies and informing for disqualified applicants.
Actors	Admin Clerk, Director Admin
Pre-Conditions	Relevant paper advertisement has been published in News Papers.
Post-Conditions	To have a list of qualified applicants and disqualified applicants have been informed.
Flow of Events	<ul style="list-style-type: none"> ✓ Receive applications ✓ Short list applications ✓ Applications are numbered ✓ Prepare Qualified Applications List ✓ Approve Qualified Applications ✓ Prepare disqualified Applications List ✓ Approve Disqualified Applications List ✓ Prepare Letters to Disqualified Applicants

	<ul style="list-style-type: none"> ✓ Sign on Letters to Disqualified Applicants ✓ Send Letters
Exceptions	None

Table B.2 - Existing System – Handle Applications Use Case Description

Use Case Description - Conduct Exam

Use Case Name	Conduct Exam
Description	This use case details the process of conducting exam.
Actors	Admin Clerk, Director Admin, Top Mgt, Exam Committee
Pre-Conditions	A list of qualified applicants has been prepared.
Post-Conditions	A list of applicants who have passed the exam/test has been prepared and applicants who do not pass exam have been informed officially.
Flow of Events	<ul style="list-style-type: none"> ✓ Receive Qualified List of Applicants Parallel activities ✓ Prepare Admission ✓ Prepare Letter ✓ Sign Admission /Letter ✓ Send Admission /Letter ✓ Prepare Attendance Sheet Parallel activities ✓ Prepare Exam Papers ✓ Prepare Mark Scheme ✓ Prepare Invigilator List ✓ Conduct Exam ✓ Paper Marking ✓ Prepare Exam Summary Report ✓ Select applicants who has passed exam ✓ Prepare Selected Applicants ✓ Select applicants who has not passed exam ✓ Prepare Letters to applicants who has nor passed exam ✓ Sign Letters ✓ Send Letters
Exceptions	None

Table B.3 - Existing System – Conduct Exam Use Case Description

Use Case Description – Conduct Interviews

Use Case Name	Conduct interviews
Description	This use case details the process of conducting interviews and handling of related records
Actors	Admin Clerk, Director Admin, Interview Board
Pre-Conditions	List of Selected Applicants should be available.
Post-Conditions	Interview summary report and list of absent applicants have been prepared.
Flow of Events	<ul style="list-style-type: none"> ✓ Receive List of Selected Applicants ✓ Prepare interview calling Letters ✓ Sign Letters ✓ Send Letters ✓ Prepare a document including all relevant details of applicants for interview panel ✓ Approve the documents ✓ Send Letters to selected applicants ✓ Prepare attendance Sheets ✓ Conduct Interviews ✓ Submit interview results ✓ Prepare Interview Summary Report ✓ Approve Interview Summary Report ✓ Prepare Absent Applicants List
Exceptions	None

Table B.4 - Existing System – Conduct Interview Use Case Description

Use Case Description – Select Suitable Applicants

Use Case Name	Select Suitable Applicants
Description	This use case details the process of evaluating exam/test and interview marks of applicants and selecting suitable applicants. Non-selected applicants will be officially informed.
Actors	Admin Clerk, Director Admin, Selection Committee, Top Mgt
Pre-Conditions	Exam/Test and Interview summary reports should be available.
Post-Conditions	List of Selected Applicants has been prepared and non-selected applicants have been officially informed.
Flow of Events	<ul style="list-style-type: none"> ✓ Receive Exam Summary Report ✓ Receive Interview Summary Report ✓ Prepare final report for selection ✓ Approve report

	<ul style="list-style-type: none"> ✓ Submit report to selection committee ✓ Evaluate ✓ Prepare List of Selected Applicants ✓ Recommend List of Selected Applicants ✓ Approve List of Selected Applicants ✓ Prepare List of Non-selected Applicants ✓ Recommend List of Non-selected Applicants ✓ Approve List of Non-selected Applicants ✓ Prepare Acknowledgement letters to non-qualified applicants ✓ Approve ✓ Send letters to non-selected applicants
Exceptions	None

Table B.5 - Existing System – Select Suitable Applicant Use Case Description

Use Case Description - Handle New Appointments

Use Case Name	Handle New Appointments.
Description	This use case details how the Administration division handles the records once the list of selected applicants has been prepared up to job acceptance by the applicants.
Actors	Admin Staff Assistant, Job Applicant, Director Admin
Pre-Conditions	List of selected applicants should be available.
Post-Conditions	Relevant selected applicant has accepted the job offering.
Flow of Events	<ul style="list-style-type: none"> ✓ Receive list of selected applicants. ✓ Prepare Appointment letters. ✓ Approve appointment letter ✓ Send Appointment letters to selected applicants. ✓ Accept the Job appointment by the applicant.
Exceptions	None.

Table B.6 - Existing System – Handle New Appointment Use Case Description

Use Case Description - Keep Personnel Information

Use Case Name	Keep Personnel Information.
Description	This use case details the steps of keeping records of new recruit who has accepted job offering.
Actors	Admin Clerk, Employee, Director Admin
Pre-Conditions	Relevant selected applicant has accepted the job offering.
Post-Conditions	A personnel file is opened, Personnel details have been send to Finance division.

Flow of Events	<ul style="list-style-type: none"> ✓ Administration division issues main documents to the new recruit. ✓ New recruit submits main documents after filling. ✓ Assign a personnel no and update Employee Register. ✓ Opening a personnel File for the new recruit ✓ Prepare Allocation letter. ✓ Approve Allocation Letter. ✓ Issue Allocation letter to new recruit. ✓ Issue Office Manual. ✓ Send personnel details to the Finance division. ✓ Include employee's details to the Increment register.
Exceptions	None.

Table B.7 - Existing System – Keep Personnel Information Use Case Description

Use Case Description - Assign EPF No

Use Case Name	Assign EPF No.
Description	This use case details the steps of assign an EPF no to a new recruit.
Actors	Admin Clerk
Pre-Conditions	A personnel file has been opened.
Post-Conditions	New Recruit has been given the EPF No.
Flow of Events	<ul style="list-style-type: none"> ✓ Receive List of new Recruits. ✓ Get EPF Register. ✓ Look for next EPF No. ✓ Assign next EPF No to new Recruit. ✓ Update EPF Register.
Exceptions	None.

Table B.8 - Existing System – Assign EPF No Use Case Description

Use Case Description - Complete EPF Forms

Use Case Name	Complete EPF Forms.
Description	This use case describes how relevant EPF forms are made ready so that those can be sent to Labor Department.
Actors	Admin Clerk, Employee, Top Mgt.
Pre-Conditions	An EPF No has been assigned to new recruit.
Post-Conditions	EPF 'A', 'B', 'H' forms have been sent to Labor Department.
Flow of Events	<ul style="list-style-type: none"> ✓ Issue EPF 'A', 'B', 'H' forms to new Recruit. ✓ EPF 'A', 'B', 'H' forms are filled by new Recruit and submit to Administration division. ✓ Receive filled EPF 'A', 'B', 'H' forms. ✓ Get Director General Approval.

	<ul style="list-style-type: none"> ✓ File copies to EPF File. ✓ Update EPF Register. ✓ Send EPF 'A', 'B', 'H' to Labour Dept.
Exceptions	None.

Table B.9 - Existing System – Complete EPF Forms Use Case Description

Use Case Description - Handle Receiving EPF/ETF Forms

Use Case Name	Handle Receiving EPF/ETF Forms
Description	This use case details the records keeping when EPF 'B' form is received from labor Department and ETF 'K' form is submitted by retired / terminated employee.
Actors	Admin Clerk, Employee.
Pre-Conditions	EPF 'A', 'B', 'H' forms have been sent to Labor Department.
Post-Conditions	Employee who has retired or terminated service has received ETF 'K' form certified by SLSI.
Flow of Events	<ul style="list-style-type: none"> ✓ Check whether EPF 'B' form received from Labor Department. ✓ If not received Inform to Labor Dept. that EPF 'B' card have not been received ✓ Receive EPF 'B' card ✓ Insert it to the Personnel File ✓ Employee submit ETF 'K' form to be certified by SLSI when retired / terminated service ✓ Certify ETF 'K' form ✓ Issue the certified ETF 'K' form retired/terminated employee
Exceptions	<ul style="list-style-type: none"> ✓ If EPF 'B' form has been already received to SLSI, no need to inform to labor Department and it can be directly put into the relevant personnel file of the employee.

Table B.10 - Existing System – Handle Receiving EEPF/ETF Forms Use Case Description

Use case diagram, activity diagrams and use case descriptions for the proposed system

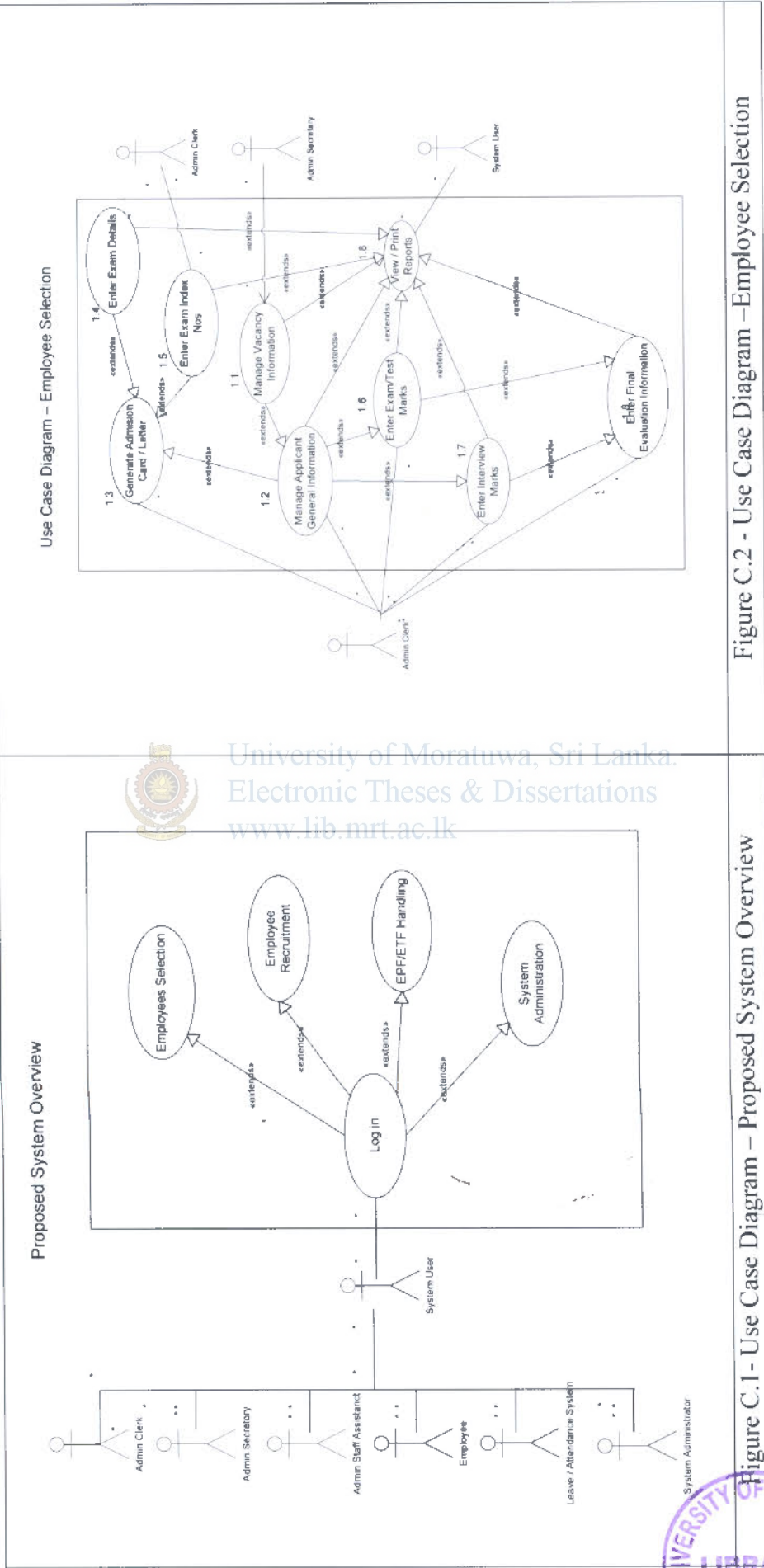


Figure C.1 - Use Case Diagram - Proposed System Overview

Use Case Diagram - Employee Selection

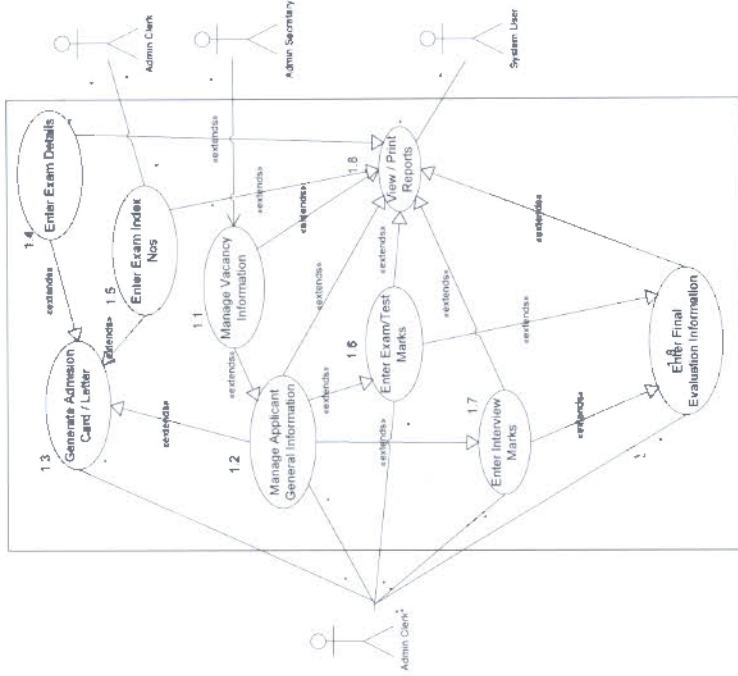
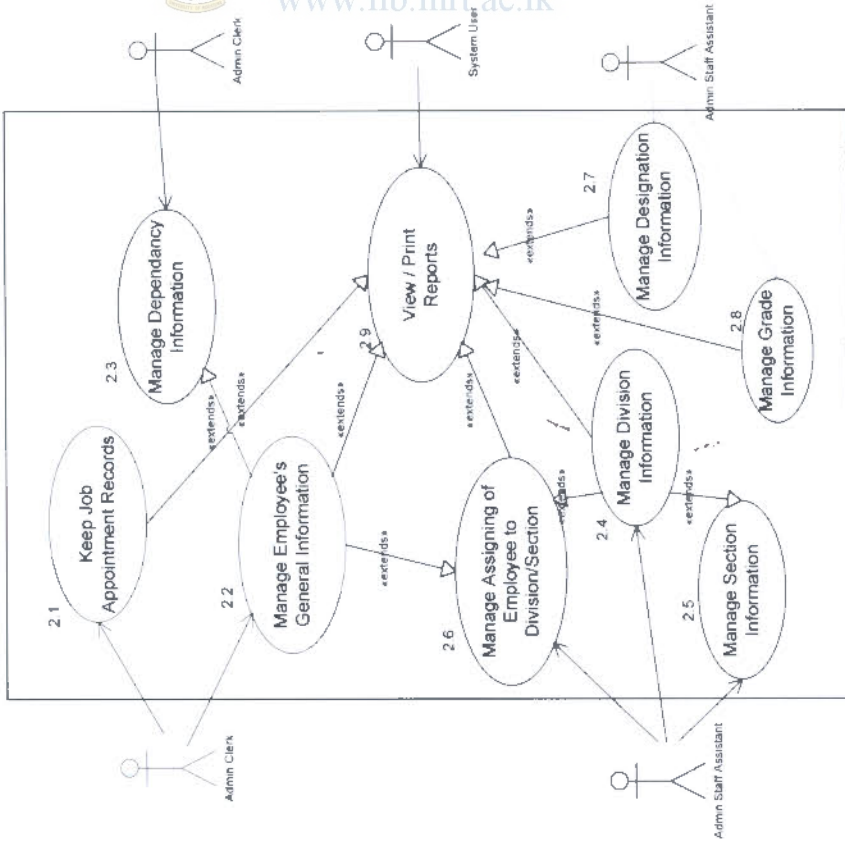


Figure C.2 - Use Case Diagram - Employee Selection



Use Case Diagram – Employee Recruitment



Use Case Diagram 3.0 – EPF/ETF Handling

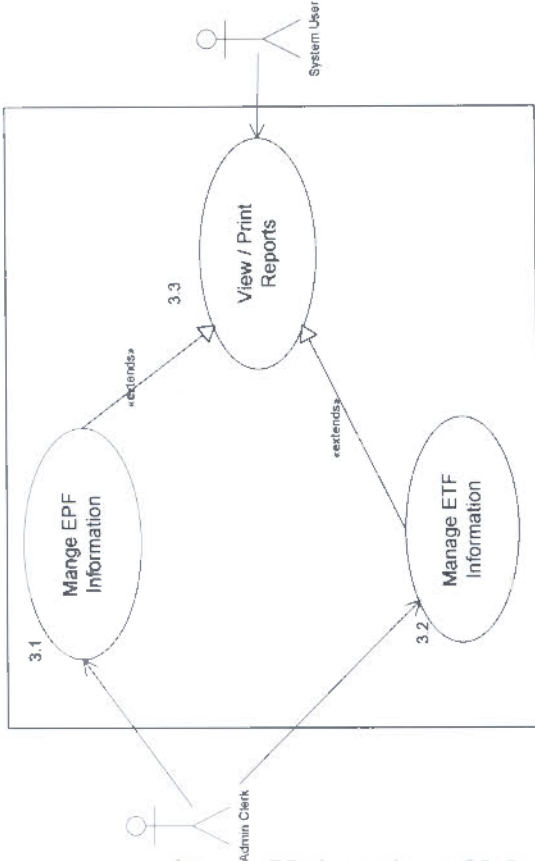
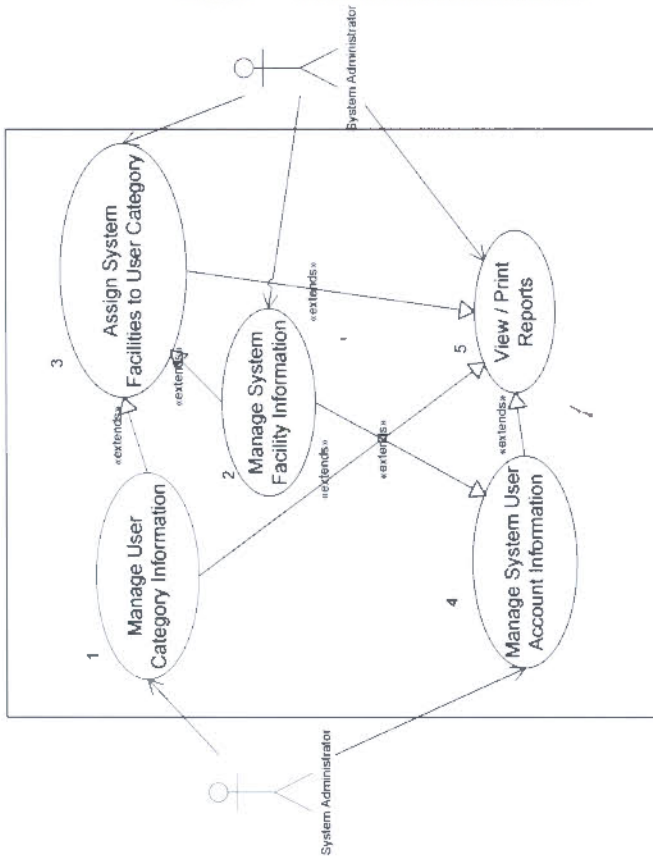


Figure C.3 - Use Case Diagram – Employee Recruitment

Figure C.4 - Use Case Diagram – EPF/ETF Handling

Use Case Diagram – System Administration



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Activity Diagram – Log in to the System

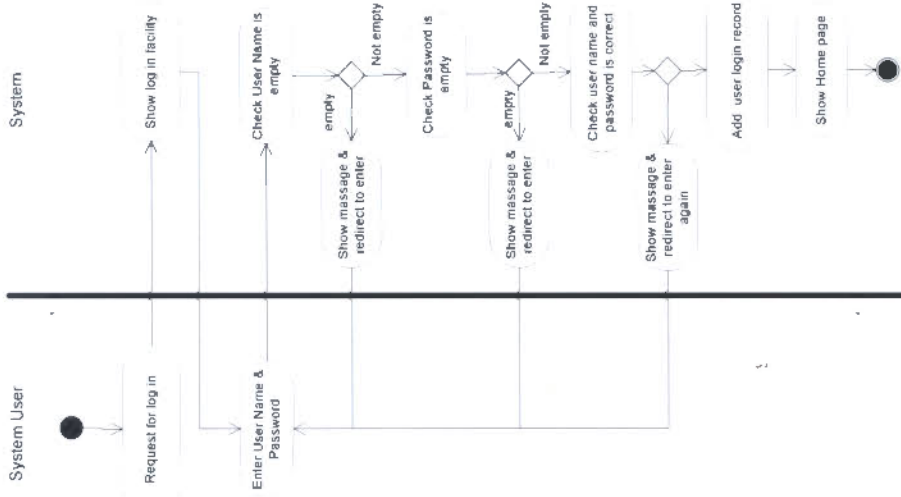
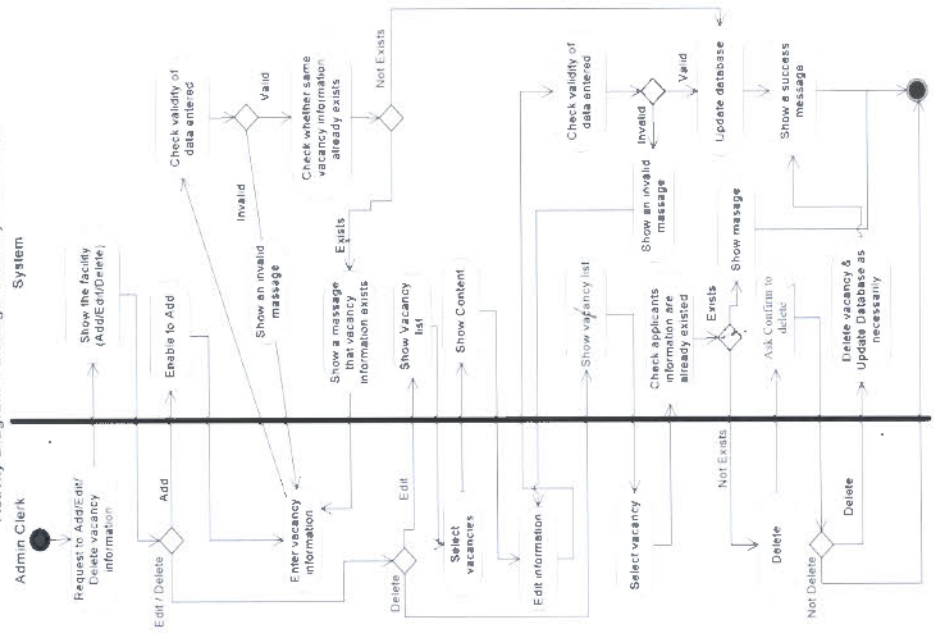


Figure C.6 - Activity Diagram – Log in to the System

Figure C.5 - Use Case Diagram – System Administration



Activity Diagram – Manage Vacancy Information System



Activity Diagram – Manage Applicant General Information System

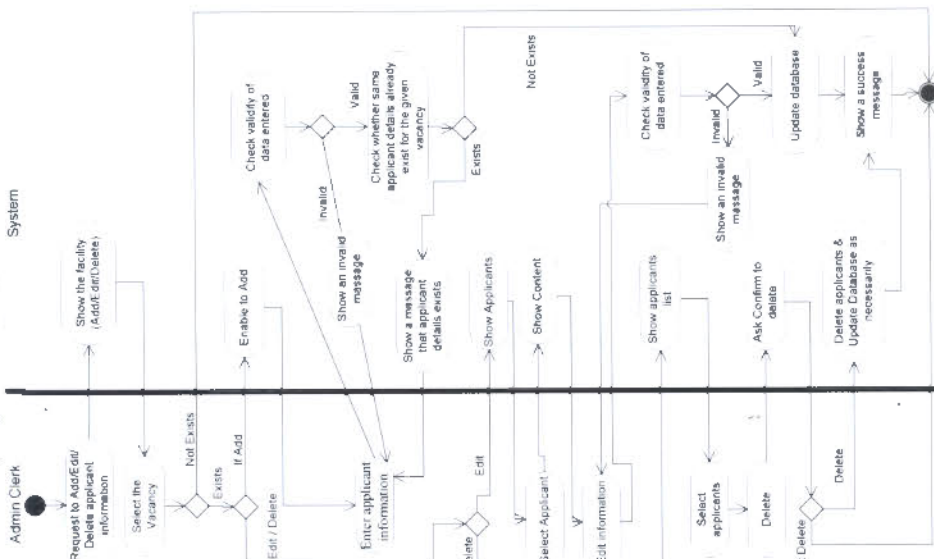


Figure C.7 - Activity Diagram – Manage Vacancy Information

Figure C.8 - Activity Diagram–Manage Applicant general Information



Activity Diagram – Generate Admission Cards

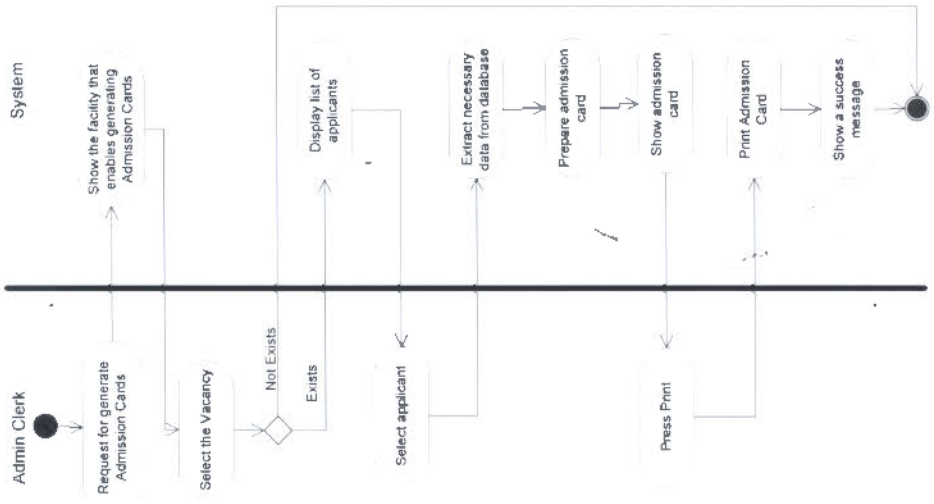


Figure C.9 - Activity Diagram – Generate Admission Cards

Activity Diagram – Enter Exam Details

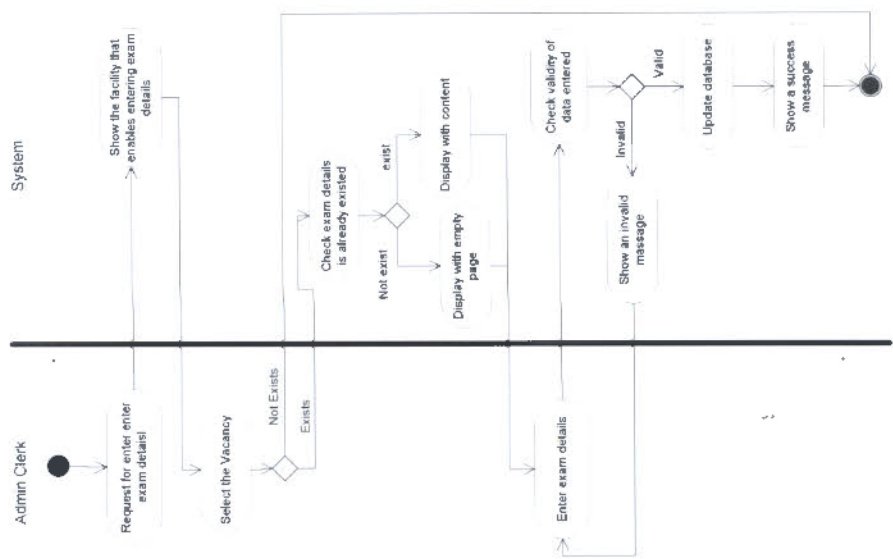


Figure C.10 - Activity Diagram – Enter Exam Details

Activity Diagram – Enter Exam/Test Marks

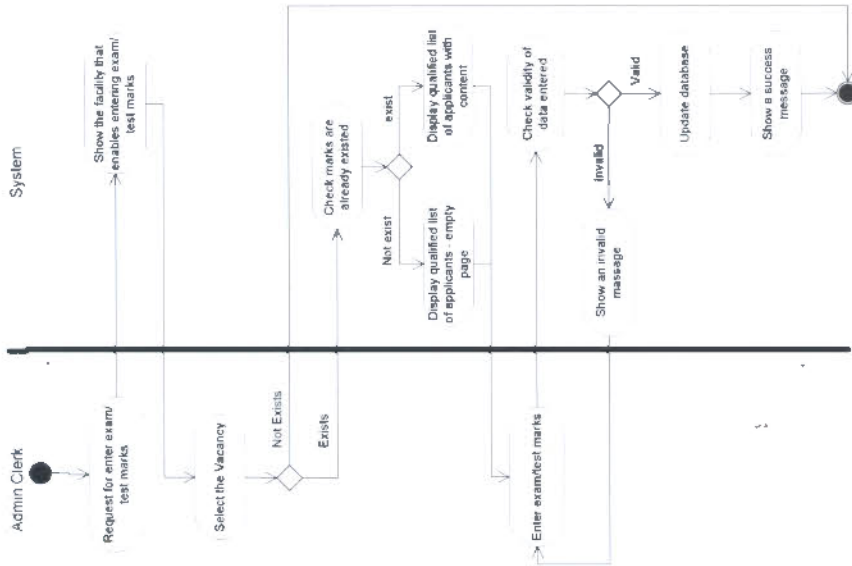


Figure C.12 - Activity Diagram – Enter Exam/Test Marks

Activity Diagram – Enter Exam Index Nos

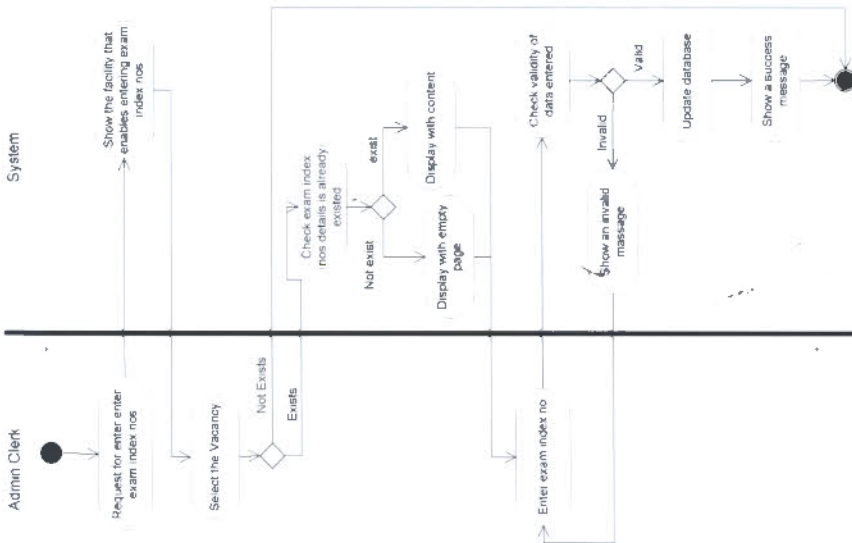
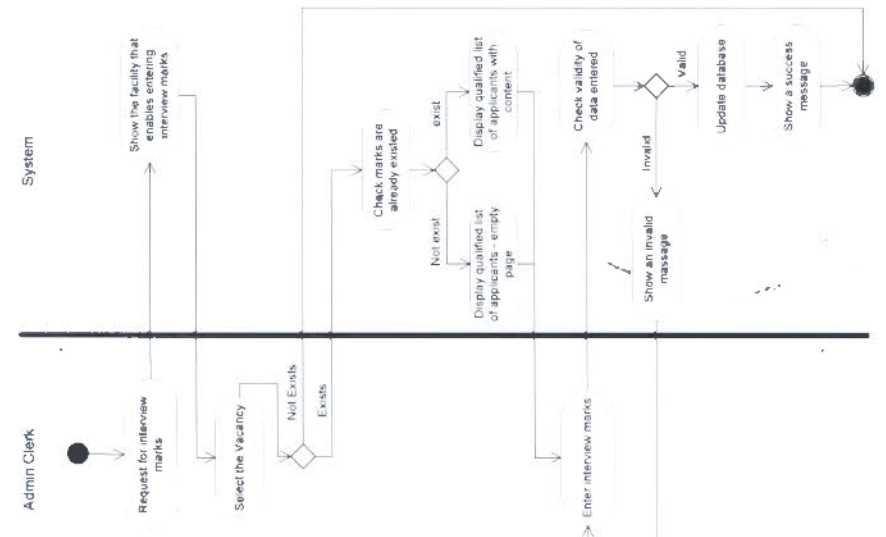


Figure C.11 - Activity Diagram – Enter Exam Index Nos





Activity Diagram – Enter Interview Marks



Activity Diagram – Enter Final Evaluation Records

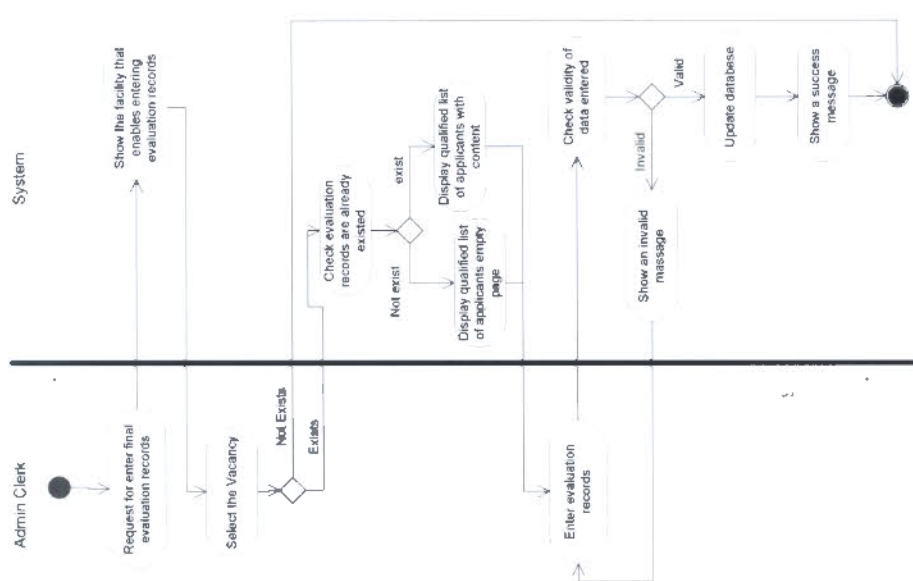
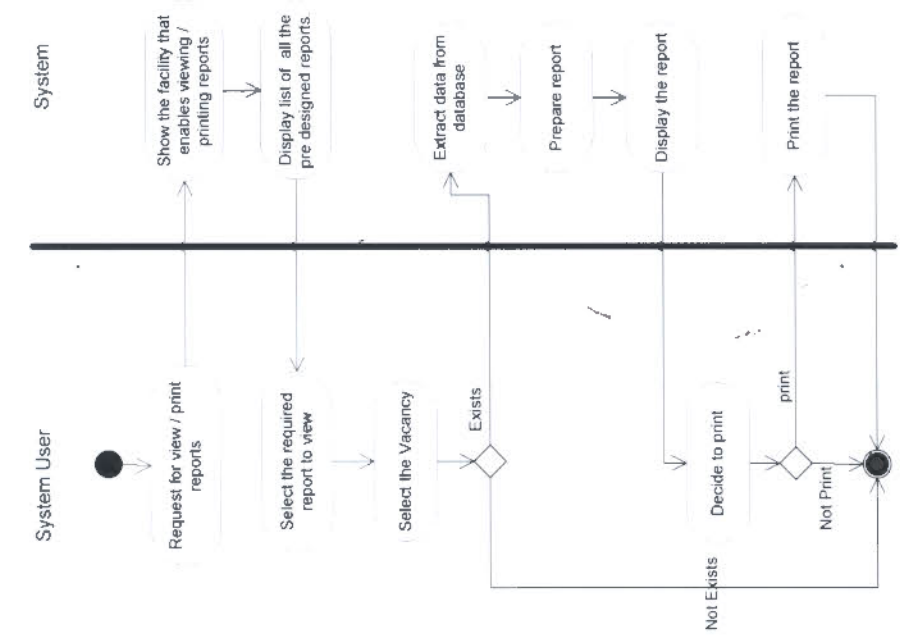


Figure C.13 - Activity Diagram – Enter Interview Marks

Figure C.14 - Activity Diagram – Enter Final Evaluation Records



Activity Diagram - View / Print Reports



Activity Diagram - Keep Job Appointment Records

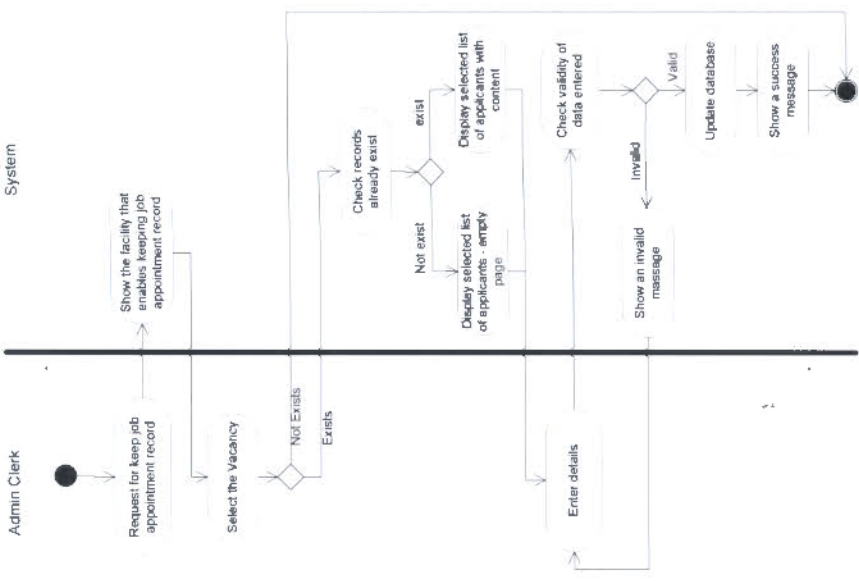


Figure C.15 - Activity Diagram - View/Print Reports of Employee Selection

Figure C.16 - Activity Diagram - Keep Job Appointment Records

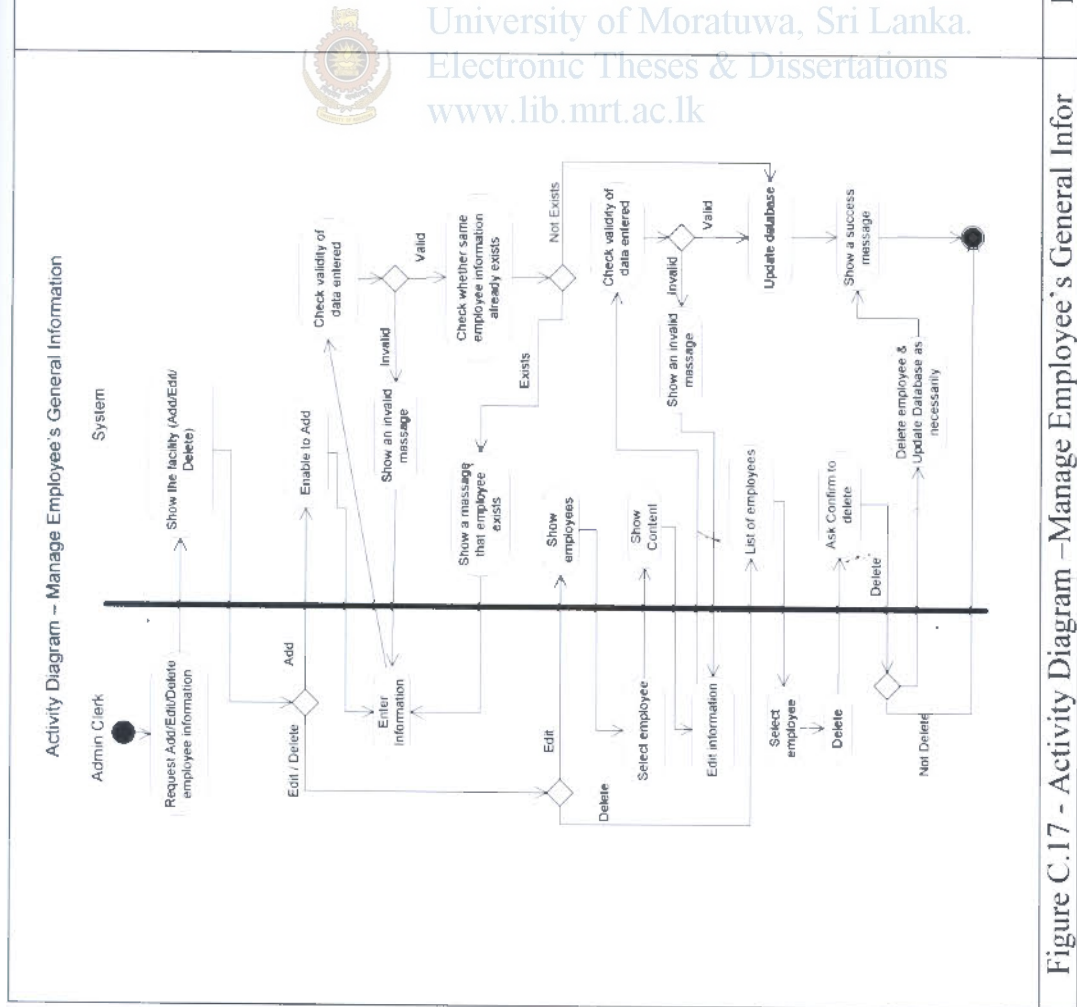


Figure C.17 - Activity Diagram - Manage Employee's General Infor

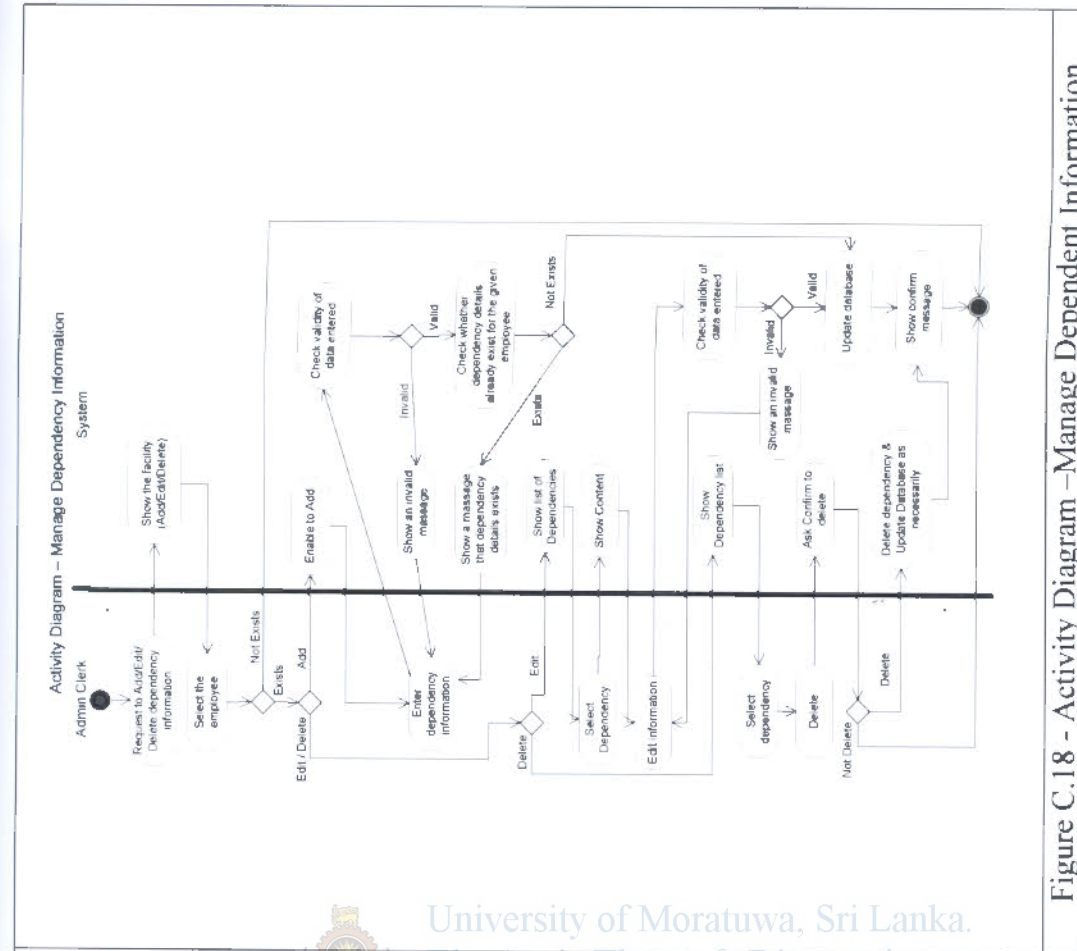


Figure C.18 - Activity Diagram - Manage Dependent Information



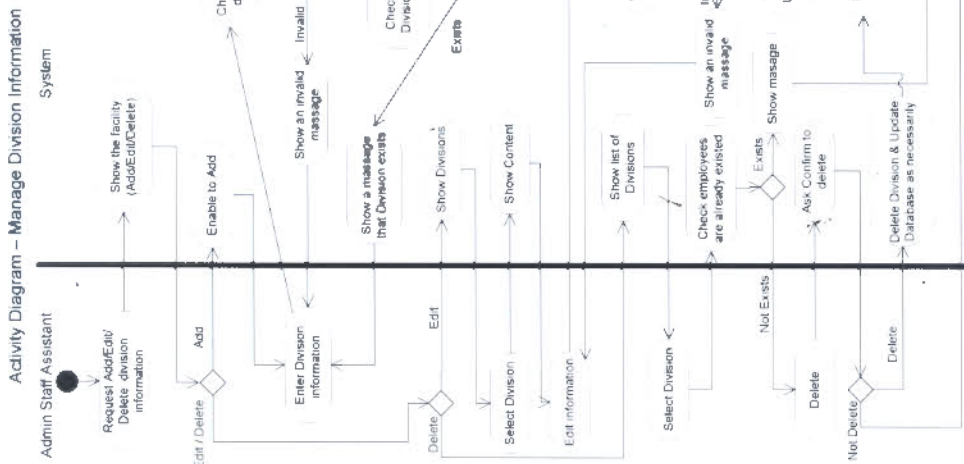


Figure C.19 - Activity Diagram - Manage Division Information

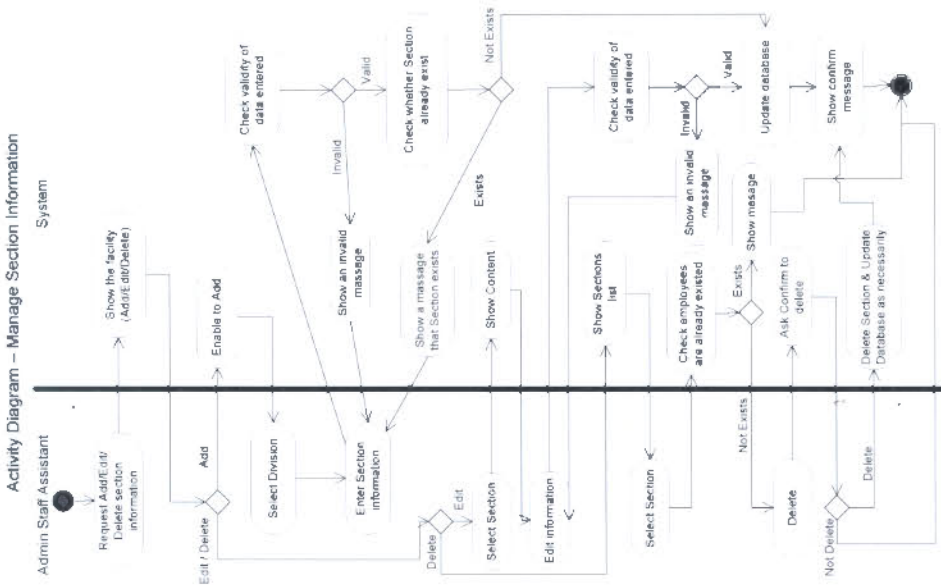


Figure C.20 - Activity Diagram - Manage Section Information

Activity Diagram – Manage Grade Information

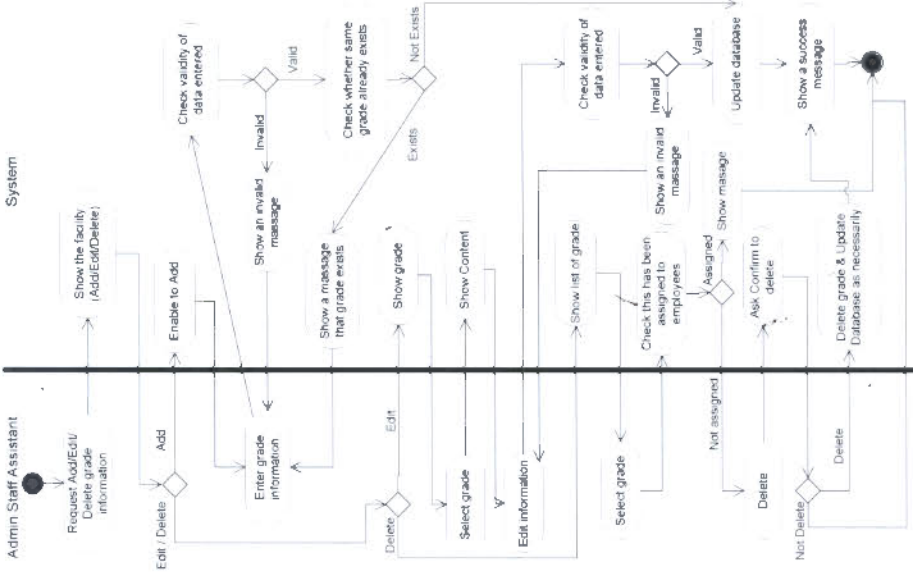


Figure C.23 - Activity Diagram –Manage Grade Information

Activity Diagram – View / Print Reports of Employee Recruitments

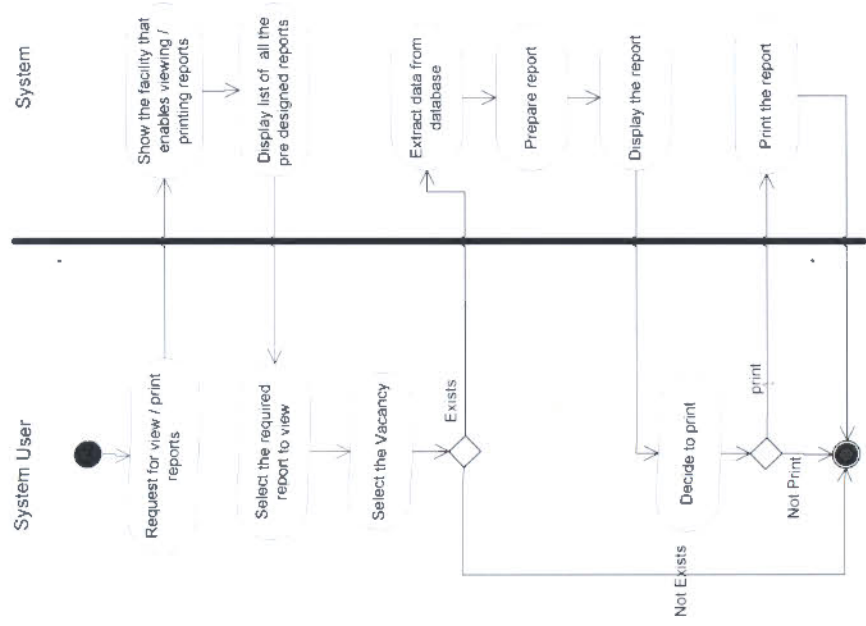


Figure C.24 - Activity Diagram –View / Print Reports of Employee Recruitment



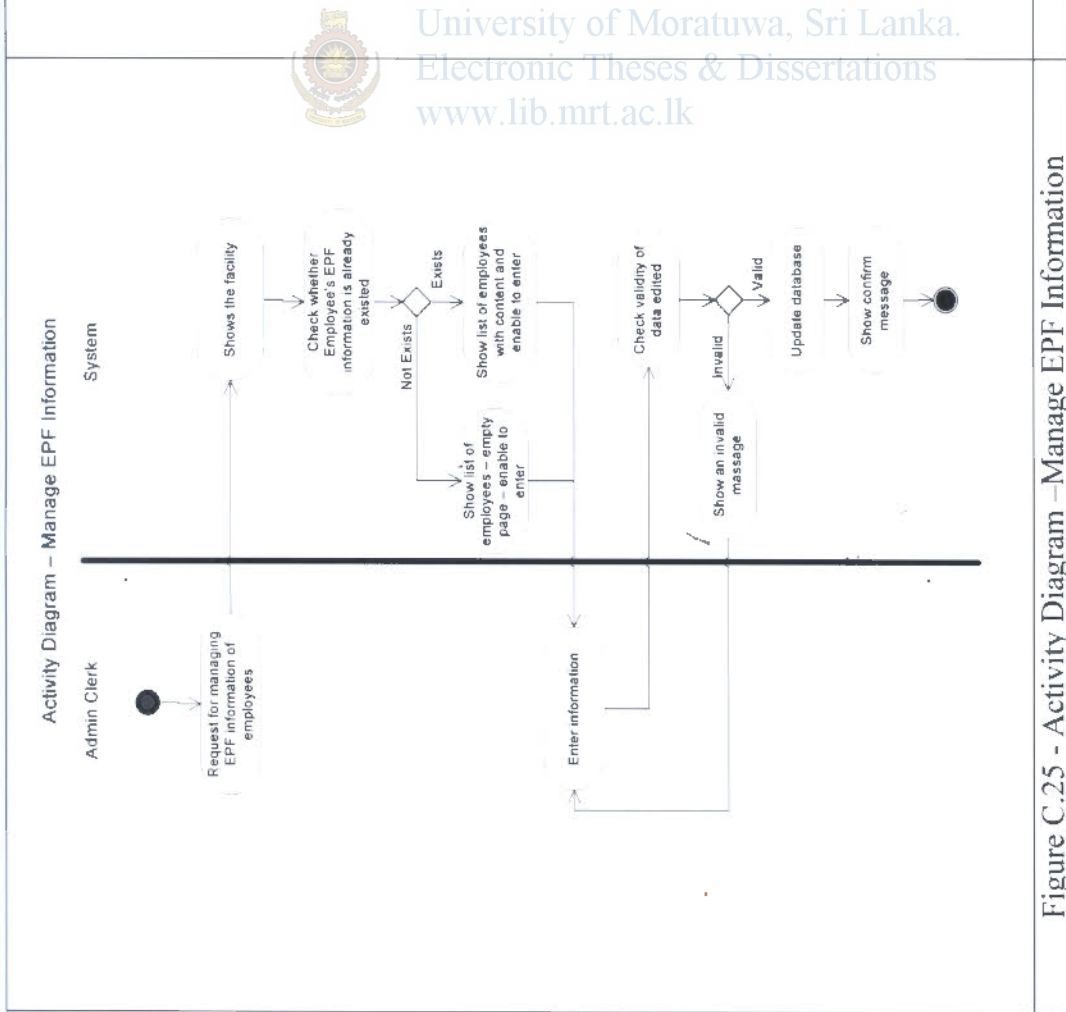


Figure C.25 - Activity Diagram - Manage EPF Information

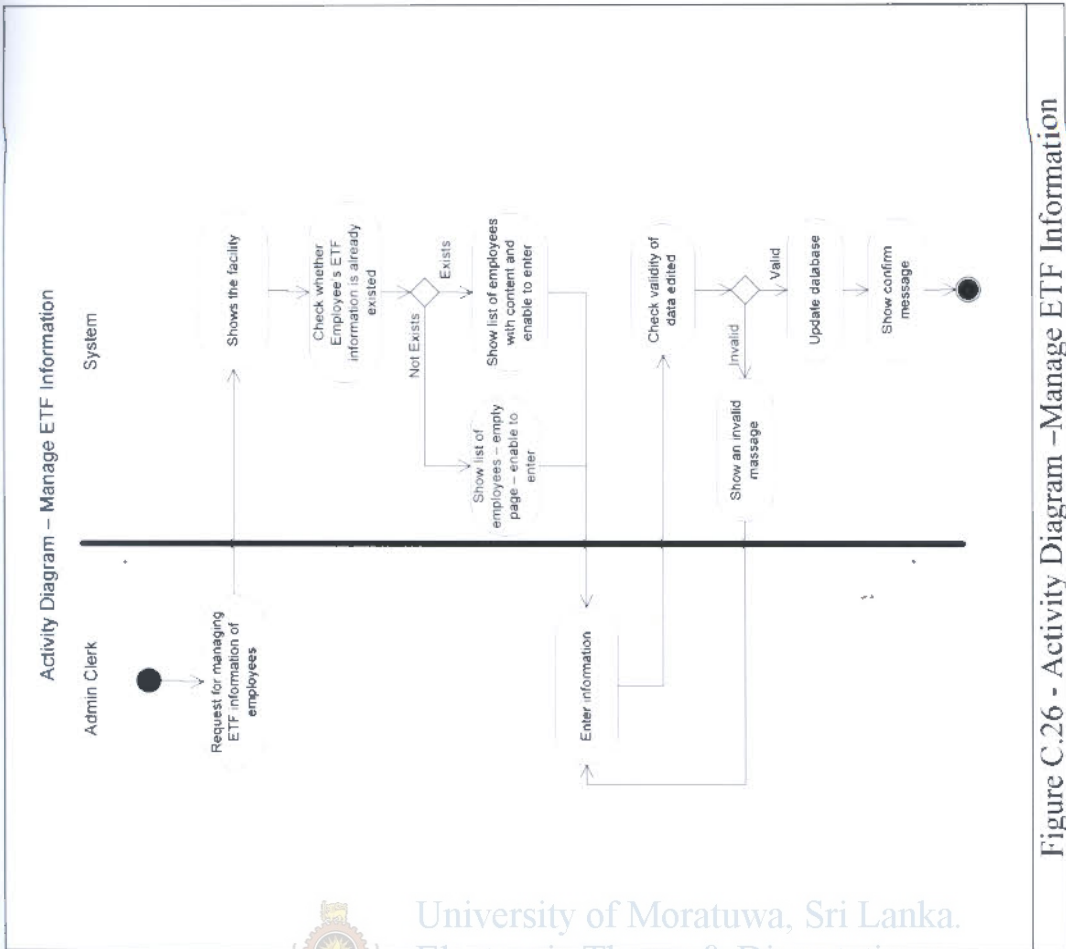


Figure C.26 - Activity Diagram - Manage ETF Information



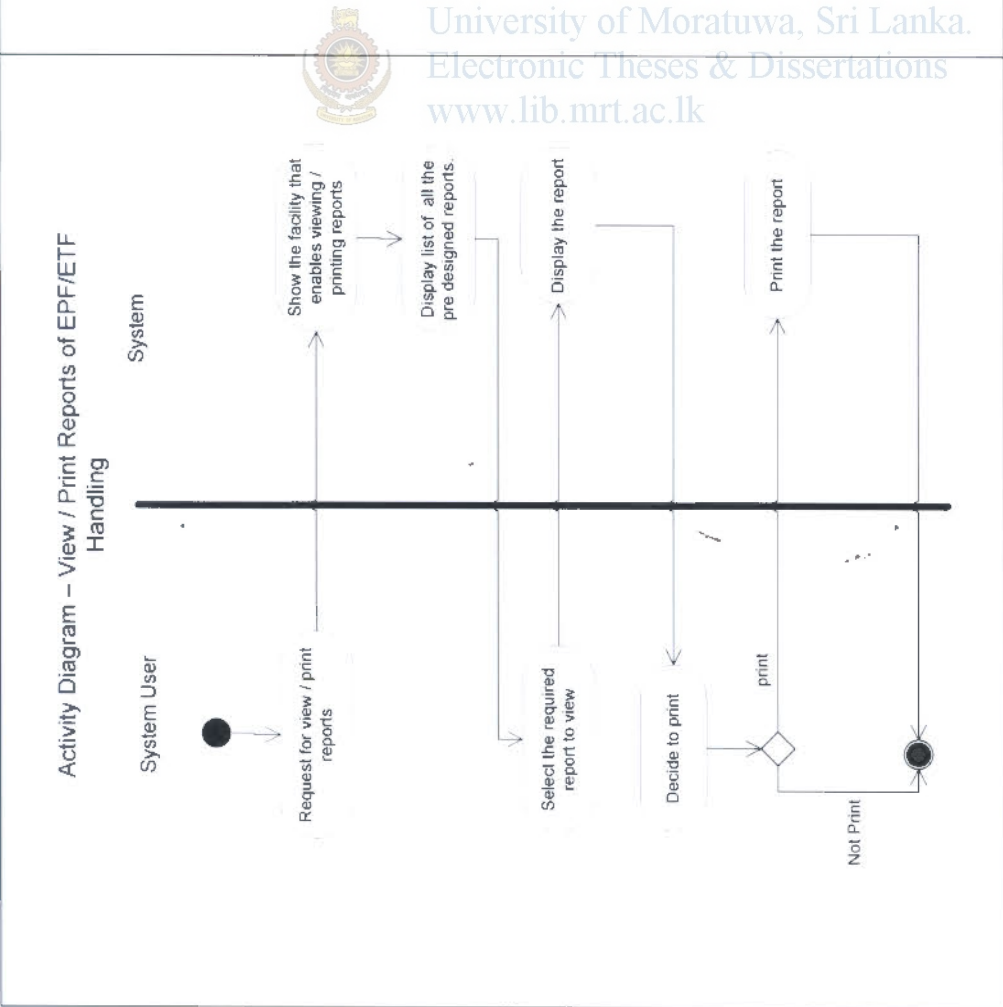


Figure C.27 - Activity Diagram –View / Print Reports of EPF/ETF Handling

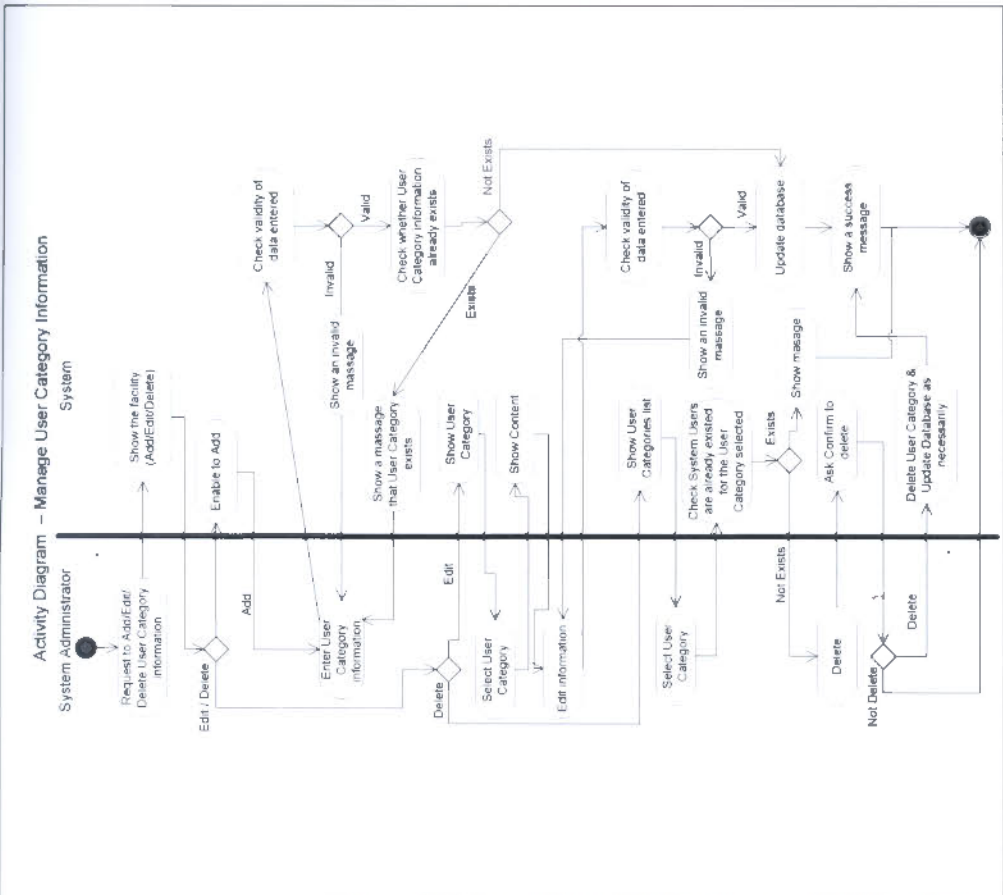


Figure C.28 - Activity Diagram –Manage User Category Information



Activity Diagram – Manage System Facility Information

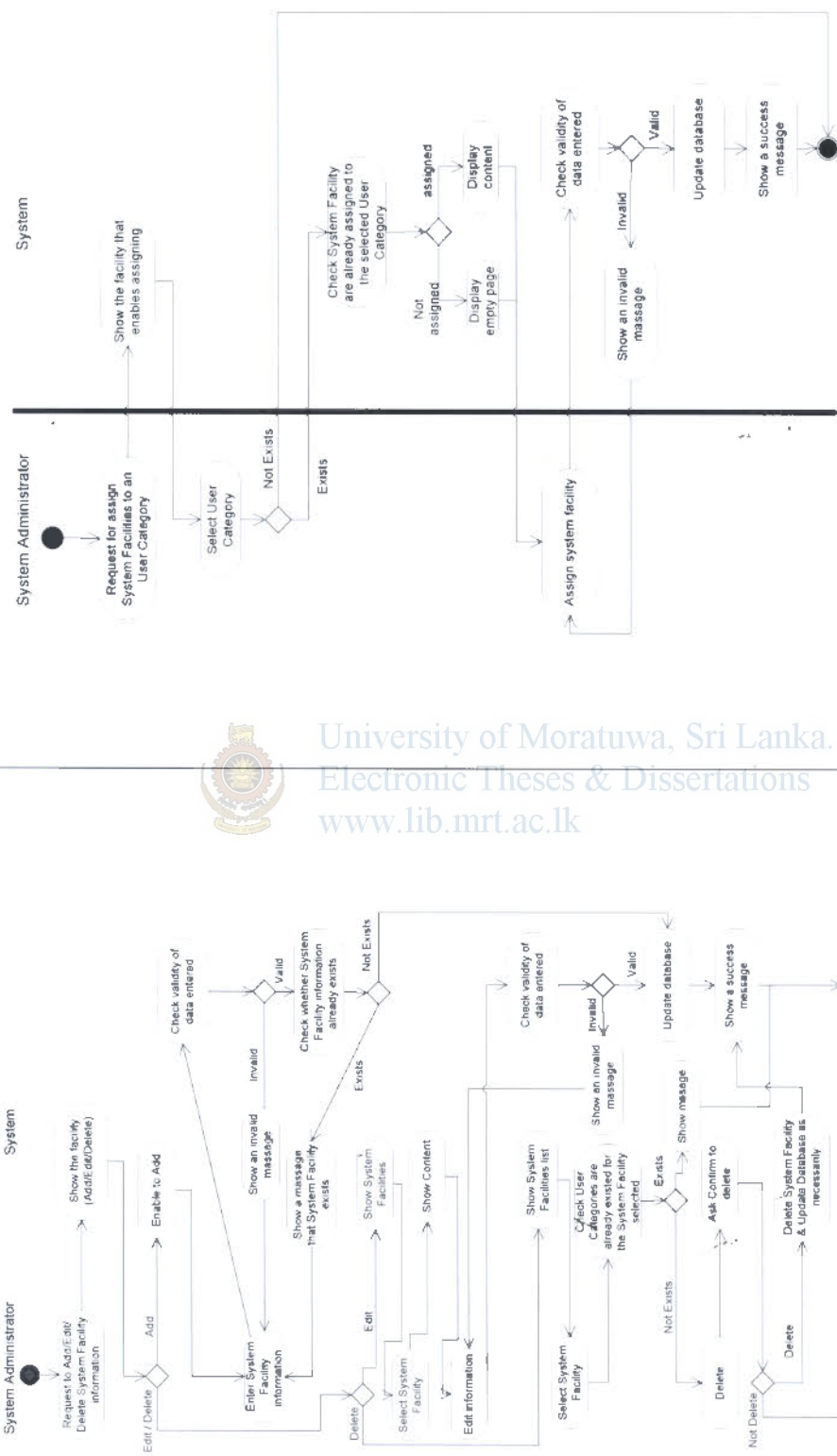


Figure C.29 - Activity Diagram – Manage System Facility Information

Activity Diagram – Assign System Facilities to User Category

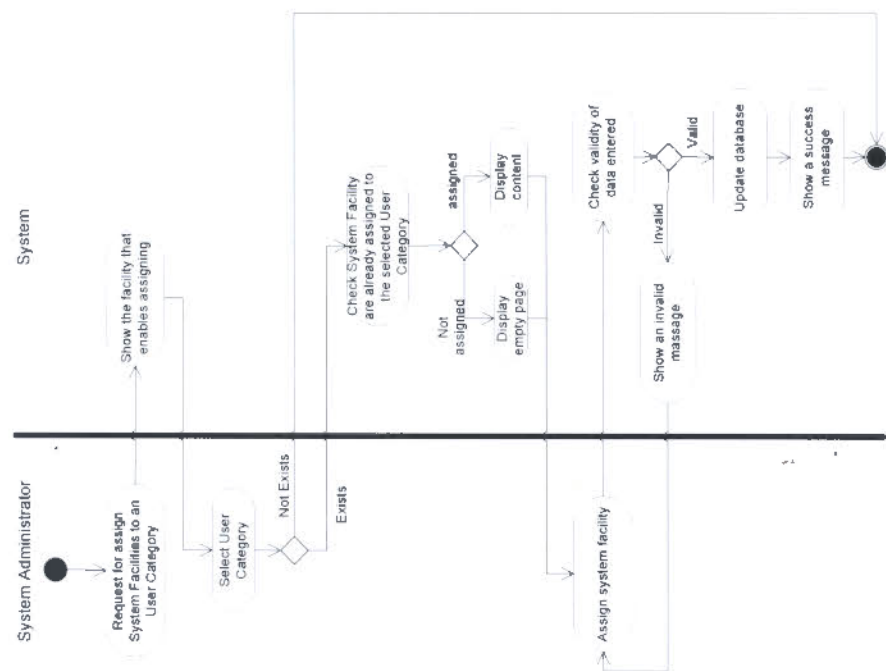


Figure C.30 - Activity Diagram – Assign System Facility to user Category

Activity Diagram – Manage System User Account Information

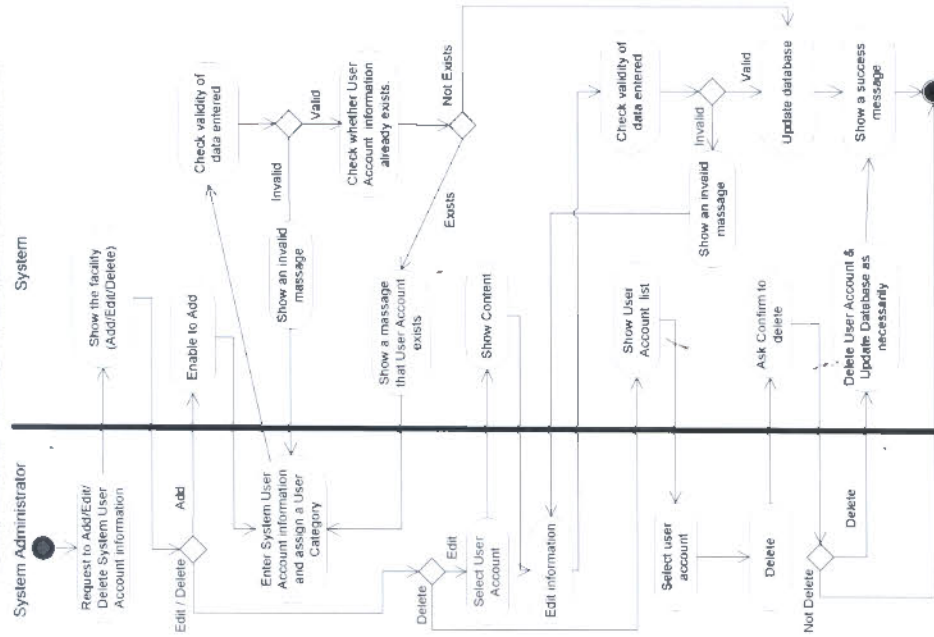


Figure C.28 - Activity Diagram –Manage System User Account Information

Activity Diagram – View / Print Reports

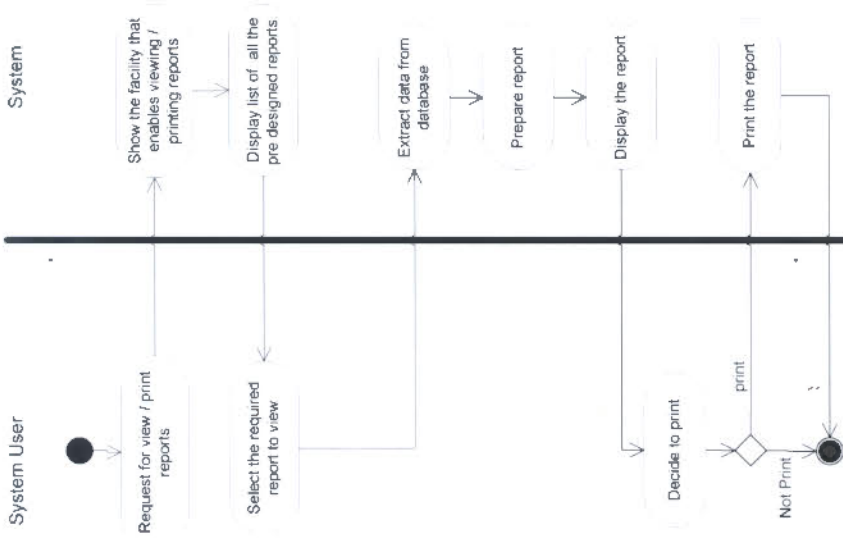


Figure C.28 - Activity Diagram –View / Print Reports of System Administration



Use Case Description – Log in to the System

Use Case Name	Log in to the System
Description	This use case describes steps of login into the system and also adding a record of log user record to the database.
Actors	System User, System
Pre-Conditions	System should have user name and password and also the system should up and run.
Post-Conditions	System user has been granted to enter into the system.
Flow of Events	<ul style="list-style-type: none"> ✓ System User requests for log in. ✓ System Shows log in facility. ✓ System User enters User Name & Password. ✓ System checks User Name is empty. ✓ If not empty then system checks password is empty. ✓ If not empty then system check entered user name and password is correct. ✓ If correct then system adds a new record of logged user to the data base and redirect to home page.
Exceptions	<ul style="list-style-type: none"> ✓ If the user name is empty then system shows a message & redirect to enter user name. ✓ If the password is empty then system shows a message & redirect to enter password. ✓ If user name and password is incorrect then system show a incorrect message

Table C.1 - Proposed System – Log-in Use Case Description

Use Case Description – Manage Vacancy information

Use Case Name	Manage Vacancy information
Description	This use case describes how to add/edit/delete vacancy information.
Actors	Admin Clerk, System
Pre-Conditions	Vacancy should have been published.
Post-Conditions	Vacancy information has been updated.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin clerk requests the facility required (Add/Edit/Delete) to manage vacancy information. ✓ System shows the facility required. ✓ If select add then system enables to add information. ✓ Admin clerk enters vacancy information. ✓ System checks the validity of data entered. ✓ If valid then system checks whether vacancy information already exists.

	<ul style="list-style-type: none"> ✓ If vacancy information not exist then system update database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If vacancy information already exists then system shows a message that vacancy information exists. ✓ If data entered is invalid, System shows an invalid message. ✓ If Admin clerk selects edit then system shows list of vacancies. <ul style="list-style-type: none"> ○ Admin clerk selects the vacancy. ○ System shows the existing content. ○ Admin clerk edits information. ○ The System directs to check validity of data entered and continue update database and finally shows a success message. ✓ If Admin clerk selects delete then system shows vacancies list. <ul style="list-style-type: none"> ○ System show list of existing vacancies ○ Admin clerk selects a vacancy. ○ System checks applicants' information has already been are entered to the selected vacancy. ○ If applicant's information does not exist for the selected vacancy then the admin clerk specifies to delete. ○ If not shows a message. ○ System asks admin clerk to confirm deletion. ○ If admin clerk confirms to delete then System deletes vacancy & updates database as necessarily and shows a success message.

Table C.2 - Proposed System – Manage Vacancy Information Use Case Description

Use Case Description - Manage Applicant General Information

Use Case Name	Manage Applicant General Information
Description	This use case describes how to add/edit/delete applicant information.
Actors	Admin Clerk, System
Pre-Conditions	Application should be available.
Post-Conditions	Applicant information has been entered to the database. Applicant is either considered as qualified or disqualified.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin clerk requests the facility required (Add/Edit/Delete) to manage applicant information. ✓ System shows the facility. ✓ Admin clerk selects the vacancy. ✓ If vacancy exists and admin clerk has selected add facility then

	<p>system enables to add information.</p> <ul style="list-style-type: none"> ✓ Admin clerk enters applicant information. ✓ System checks the validity of data entered ✓ If valid then system checks whether the given applicant name is already exist for the selected vacancy. ✓ If not exist, then system updates database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If vacancy does not exist then admin clerk has to close the facility being used and make sure to enter vacancy information. ✓ If data entered is invalid, system shows an invalid message. ✓ If applicant name already exists for the given vacancy then system shows a message that applicant already exists. ✓ If admin clerk selects edit facility then system shows list of applicants. <ul style="list-style-type: none"> ○ Admin clerk selects the required applicant. ○ System shows the existing content of the selected applicant. ○ Admin clerk edits information. ○ The System directs to check validity of data entered and continues to update data base and finally show a success message. ✓ If Admin clerk selects delete facility then system shows applicants list. <ul style="list-style-type: none"> ○ Admin clerk selects applicant. ○ Admin clerk specifies to delete. ○ System asks admin clerk to confirm deletion. ○ If admin clerk confirms to delete then system deletes applicant & updates database as necessarily and shows a success message.

Table C.3 - Proposed System – Manage Applicant General Information Use Case Description

Use Case Description – Generate Admission Cards

Use Case Name	Generate Admission Cards
Description	This use case details the steps of generating admission cards.
Actors	Admin Clerk, System
Pre-Conditions	Qualified applicants should have been indicated.
Post-Conditions	Admission Cards have been printed.

Table C.5 - Proposed System –Enter Exam Details Use Case Description

Use Case Description – Enter Exam Index Nos

Use Case Name	Enter exam index nos
Description	This use case describes steps of entering exam index nos of qualified applicants.
Actors	Admin Clerk, System
Pre-Conditions	Qualified applicants should have been identified.
Post-Conditions	Exam index nos have been updated.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin clerk requests for enter exam index nos. ✓ System shows the facility that enables entering exam index nos. ✓ Admin clerk selects the vacancy. ✓ If vacancy exists then admin clerk checks exam index nos are already existed. ✓ If exam index nos have not been entered then system displays qualified list of applicants so that exam index nos can be entered. ✓ Admin clerk enters exam index nos. ✓ System checks validity of data entered. ✓ If valid, System updates database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If vacancy does not exist then admin clerk has to close the facility being used and make sure to enter vacancy information.. ✓ If exam index nos are already entered then system displays the content so that it can be edited. ✓ If data entered is invalid, system shows an invalid message.

Table C.6 - Proposed System –Enter Exam Index Nos Use Case Description

Use Case Description – Enter Exam/Test Marks

Use Case Name	Enter Exam/Test Marks
Description	This use case describes steps of entering exam/test marks obtained by qualified applicants.
Actors	Admin Clerk, System
Pre-Conditions	Qualified applicants should have been indicated.
Post-Conditions	Exam marks have been updated.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin Clerk requests for enter exam/test marks. ✓ System shows the facility that enables entering exam/test marks ✓ Admin Clerk selects the Vacancy. ✓ If Vacancy exists then Admin Clerk checks marks are already existed.

Table C.5 - Proposed System –Enter Exam Details Use Case Description

Use Case Description – Enter Exam Index Nos

Use Case Name	Enter exam index nos
Description	This use case describes steps of entering exam index nos of qualified applicants.
Actors	Admin Clerk, System
Pre-Conditions	Qualified applicants should have been identified.
Post-Conditions	Exam index nos have been updated.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin clerk requests for enter exam index nos. ✓ System shows the facility that enables entering exam index nos. ✓ Admin clerk selects the vacancy. ✓ If vacancy exists then admin clerk checks exam index nos are already existed. ✓ If exam index nos have not been entered then system displays qualified list of applicants so that exam index nos can be entered. ✓ Admin clerk enters exam index nos. ✓ System checks validity of data entered. ✓ If valid, System updates database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If vacancy does not exist then admin clerk has to close the facility being used and make sure to enter vacancy information.. ✓ If exam index nos are already entered then system displays the content so that it can be edited. ✓ If data entered is invalid, system shows an invalid message.

Table C.6 - Proposed System –Enter Exam Index Nos Use Case Description

Use Case Description – Enter Exam/Test Marks

Use Case Name	Enter Exam/Test Marks
Description	This use case describes steps of entering exam/test marks obtained by qualified applicants.
Actors	Admin Clerk, System
Pre-Conditions	Qualified applicants should have been indicated.
Post-Conditions	Exam marks have been updated.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin Clerk requests for enter exam/test marks. ✓ System shows the facility that enables entering exam/test marks ✓ Admin Clerk selects the Vacancy. ✓ If Vacancy exists then Admin Clerk checks marks are already existed.

	<ul style="list-style-type: none"> ✓ If marks have not been entered then System displays qualified list of applicants so that marks can be entered. ✓ Admin Clerk enters exam/test marks ✓ System checks validity of data entered. ✓ If valid, System updates database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If Vacancy does not exist then Admin clerk has to close the facility being used and make sure to enter Vacancy information. ✓ If marks are already entered then System displays the content so that it can be edited. ✓ If data entered is invalid, System shows an invalid message.

Table C.7 - Proposed System –Enter Exam/Test Marks Use Case Description

Use Case Description – Enter Interview Marks

Use Case Name	Enter Interview Marks
Description	This use case describes steps of entering interview marks obtained by qualified applicants.
Actors	Admin Clerk, System
Pre-Conditions	Qualified applicants should have been identified.
Post-Conditions	Interview marks have been updated.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin Clerk requests for enter interview marks. ✓ System shows the facility that enables entering interview marks ✓ Admin Clerk selects the Vacancy. ✓ If Vacancy exists then Admin Clerk checks marks are already existed. ✓ If marks have not been entered then System displays qualified list of applicants so that marks can be entered. ✓ Admin Clerk enters interview marks ✓ System checks validity of data entered. ✓ If valid, System updates database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If Vacancy does not exist then Admin clerk has to close the facility being used and make sure to enter Vacancy information.. ✓ If marks are already entered then System displays the content so that it can be edited. ✓ If data entered is invalid, System shows an invalid message.

Table C.8 - Proposed System – interview Marks Use Case Description



Use Case Description – Enter Final Evaluation Records

Use Case Name	Enter Final Evaluation Records
Description	This use case describes steps of entering applicants' final evaluation records.
Actors	Admin Clerk, System
Pre-Conditions	Exam/Test and interview marks should have been updated.
Post-Conditions	Final evaluation records of qualified applicants have been updated
Flow of Events	<ul style="list-style-type: none"> ✓ Admin Clerk requests for enter final evaluation records. ✓ System shows the facility that enables entering final evaluation records. ✓ Admin Clerk selects the Vacancy. ✓ If Vacancy exists then Admin Clerk checks evaluation information is already existed. ✓ If information has not been entered then System displays qualified list of applicants so that it can be entered. ✓ Admin Clerk enters evaluation records ✓ System checks validity of data entered. ✓ If valid, System updates database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If Vacancy does not exist then Admin clerk has to close the facility being used and make sure to enter Vacancy information. ✓ If evaluation information is already entered then System displays the content so that it can be edited. ✓ If data entered is invalid, System shows an invalid message.

Table C.9 - Proposed System – Final Evaluation Records Use Case Description

Use Case Description – View / Print Reports of Employee Selection

Use Case Name	View / Print Reports
Description	<p>This use case describes process of view / prints various types of reports.</p> <p>These reports are ;</p> <ul style="list-style-type: none"> Examination Records Applicants Qualified for Examination Applicants Disqualified for Examination Attendance List for Examination Absenteeism Report for Examination Exam Index List Examination Marks Exam Marks - Satisfy Conditions

	<p>Interview Records</p> <ul style="list-style-type: none"> Applicants Qualified for Interview Applicants Disqualified for Interview Absenteeism Report for Interview Attendance List for Interview Interview Marks Interview Marks - Satisfy Conditions Details of Applicants for Interview <p>Final Records</p> <ul style="list-style-type: none"> Final Evaluation Records Selected Applicants list (as new recruits) Non selected Applicants List (as new recruits)
Actors	System User, System
Pre-Conditions	Relevant use case should have been implemented.
Post-Conditions	Relevant report is viewed or printed.
Flow of Events	<ul style="list-style-type: none"> ✓ System clerk requests for view / print reports. ✓ System shows the facility that enables viewing / printing reports. ✓ System display list of all pre defined reports. ✓ System user selects the required report. ✓ System user selects the relevant vacancy. ✓ If vacancy exists then system extracts all required data from the database. ✓ System prepares and displays the report. ✓ System user decides whether to print/not print displayed report. ✓ If decided to print then system prints the report.
Exceptions	<ul style="list-style-type: none"> ✓ If vacancy does not exist then admin clerk has to close the facility being used and make sure to enter vacancy information. ✓ If system user does not decide to print then print facility ends up.

Table C.10 - Proposed System –View / Print Report of Employee Selection Use Case
Description

Use Case Description - Keep Job Appointment Records

Use Case Name	Keep Job Appointment Records
Description	This use case describes how to keep a record when selected applicants accept job appointment.
Actors	Admin Clerk, System.
Pre-Conditions	Selected applicant should have got the job appointment.
Post-Conditions	Selected applicant has accepted the job appointment. Now he/she is an employee of the organization.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin clerk requests for keep job appointment record. ✓ System shows the facility that enables keeping job appointment

	<ul style="list-style-type: none"> record. ✓ Admin clerk selects vacancy. ✓ If vacancy exists then system check records are already existed. ✓ If exists then system display list selected applicants with details. ✓ Admin Clerk enters job appointment details. ✓ System checks validity of data entered. ✓ If valid, System updates database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If vacancy does not exist then admin clerk has to close the facility being used and make sure to enter vacancy information. ✓ If not records already existed then system displays a list of selected applicants with empty details. ✓ If data entered is invalid, system shows an invalid message.

Table C.11 - Proposed System – Keep Job Appointment Records Use Case Description

Use Case Description - Manage Employee's General Information

Use Case Name	Manage Employee's General Information
Description	This use case describes how to add /edit/delete employee's general information.
Actors	Admin Clerk, System.
Pre-Conditions	Employee should have accepted the new job appointment.
Post-Conditions	Employee's general information has been entered to the system.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin Clerk requests the facility required (Add/Edit/Delete) to manage employee information. ✓ System shows the facility that enables add/edit/delete. ✓ If Admin clerk has selected add facility then system enables to add. ✓ Admin clerk enters details. ✓ System checks the validity of data entered. ✓ If valid then the system checks whether same employee details already exist. ✓ If not exists then system updates data base. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If data entered is invalid, System shows an invalid message. ✓ If employee information is already existed then System shows a message that employee information exists. ✓ If admin clerk selects edit then system shows list of employees.

	<ul style="list-style-type: none"> ○ Admin clerk selects the employee. ○ System shows the existing content. ○ Admin user edits information. ○ The System directs to check validity of data entered and continues to update database and finally shows a success message. <p>✓ If admin clerk selects delete then System shows list of employees.</p> <ul style="list-style-type: none"> ○ Admin clerk selects employee. ○ Admin clerk deletes employee. ○ System asks admin clerk to confirm deletion. ○ If admin clerk confirms to delete then system deletes employee & updates database as necessarily and shows a success message.
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Table C.12 - Proposed System – Manage employee’s General Information Use Case Description

Use Case Description - Manage Dependent Information

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Use Case Name	Manage Dependent Informationses & Dissertations
Description	This use case describes how to add/edit/delete dependency information.
Actors	Admin Clerk, System
Pre-Conditions	Employee should be available.
Post-Conditions	Dependency information has been entered to the database.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin clerk requests the facility required (Add/Edit/Delete) to manage dependent information. ✓ System shows the facility. ✓ Admin clerk selects the employee. ✓ If employee exists and admin clerk has selected add facility then system enables to add information. ✓ Admin clerk enters dependent’s information. ✓ System checks the validity of data entered ✓ If valid then system checks whether the given dependent name is already exist for the selected employee. ✓ If not exist, then system updates database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If employee does not exist then admin clerk has to close the facility being used and make sure to enter employee. ✓ If data entered is invalid, System shows an invalid message. ✓ If dependency details already exist for the given employee then

	<p>system shows a message that dependency details exists.</p> <ul style="list-style-type: none"> ✓ If admin clerk selects edit then system shows list of dependencies. <ul style="list-style-type: none"> ○ Admin clerk selects the dependency. ○ System shows the existing content. ○ Admin clerk edits information. ○ The system directs to check validity of data entered and continue to update database and finally shows a success message. ✓ If admin clerk selects delete then system shows dependency list. <ul style="list-style-type: none"> ○ Admin clerk selects dependency. ○ Admin clerk specifies to delete. ○ System asks admin clerk to confirm deletion. ○ If admin clerk confirms to delete then system deletes dependency and updates database as necessarily and shows a success message.
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Table C.13- Proposed System – Manage Dependent Use Case Description



Use Case Description - Manage Division Information

Use Case Name	Manage Division Information
Description	This use case describes how to add/edit/delete division information.
Actors	Admin Staff Assistant, System.
Pre-Conditions	Division information should be available at admin staff assistant hand
Post-Conditions	Division information is available in the system.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin staff assistant requests the facility required (Add/Edit/Delete) to division information. ✓ System shows the facility that enables add/edit/delete. ✓ If admin staff assistant has selected add facility then system enables to add. ✓ Admin staff assistant enters details. ✓ System checks the validity of data entered. ✓ If valid then the system checks whether same division details already exist. ✓ If not exists then system updates data base. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If data entered is invalid, System shows an invalid message. ✓ If division information already exists then system shows a message that Division information exists.

	<ul style="list-style-type: none"> ✓ If admin staff assistant selects edit then system shows list of divisions. <ul style="list-style-type: none"> ○ Admin staff assistant selects the division. ○ System shows the existing content. ○ Admin staff assistant edits information. ○ The system directs to check validity of data entered and continue update database and finally shows a success message. ✓ If admin staff assistant selects delete then system shows list of divisions. <ul style="list-style-type: none"> ○ Admin staff assistant selects division. ○ If employees' information does not exist for the selected division then the admin staff assistant specifies to delete. ○ If not system shows a message. ○ System asks admin staff assistant to confirm deletion. ○ If admin staff assistant confirms to delete then system deletes division & updates database as necessarily and shows a success message.
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Table C.14 - Proposed System – Manage Division Use Case Description

Use Case Description - Manage Section Information

Use Case Name	Manage Section Information
Description	This use case describes how to add/edit/delete Section Information.
Actors	Admin Staff Assistant, System.
Pre-Conditions	Section information should be available at Admin Staff Assistant hand
Post-Conditions	Section information is available in the system.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin staff assistant requests the facility required (Add/Edit/Delete) to section information. ✓ System shows the facility that enables add/edit/delete. ✓ If admin staff assistant has selected add facility then system enables to add. ✓ Admin staff assistant selects the division and enters details. ✓ System checks the validity of data entered. ✓ If valid then the system checks whether same section details already exist. ✓ If not exists then system updates data base. ✓ System shows a success message.

Exceptions	<ul style="list-style-type: none"> ✓ If data entered is invalid, System shows an invalid message. ✓ If section information already exists then system shows a message that section information already exists. ✓ If admin staff assistant selects edit then select section. <ul style="list-style-type: none"> ○ System shows the existing content. ○ Admin staff assistant edits information. ○ The system directs to check validity of data entered and continue update database and finally shows a success message. ✓ If admin staff assistant selects delete then system shows list of section. <ul style="list-style-type: none"> ○ Admin staff assistant selects section. ○ If employees' information does not exist for the selected section then the admin staff assistant specifies to delete. ○ If not system shows a message. ○ System asks Admin staff assistant to confirm deletion. ○ If admin staff assistant confirms to delete then system deletes section and updates database as necessarily and shows a success message.
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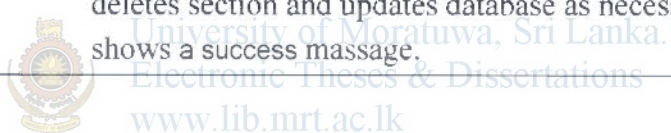


Table C.15 - Proposed System –Manage Section Use Case Description

Use Case Description - Manage Assigning of Employee to Division/Section Information

Use Case Name	Assign Employee to Division/Section
Description	This use case describes how to keep a record when selected applicants accept job appointment.
Actors	Admin Staff Assistant, System.
Pre-Conditions	Employee and Division/Section information should be available in the system
Post-Conditions	Employee has been assigned to a Division/Section.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin staff assistant requests the facility required (Add/Edit/Delete/Send History). ✓ System shows the facility that enables add/edit/delete/send history. ✓ If admin staff assistant has selected add facility then system enables to add. ✓ Admin staff assistant select section and employee. ✓ Admin staff assistant enters details. ✓ System checks the validity of data entered.

	<ul style="list-style-type: none"> ✓ If valid then the system checks whether same employee has been assigned to the selected section. ✓ If not exists then system updates data base. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If data entered is invalid, system shows an invalid message. ✓ System checks employee is already assigned to the selected section then System displays a message. ✓ If admin staff assistant selects edit then system shows list of sections. <ul style="list-style-type: none"> ○ Admin staff assistant selects the section ○ System shows list of existing employees ○ Admin staff assistant selects the employee. ○ System shows the existing content. ○ Admin staff assistant edits information. ○ The system directs to check validity of data entered and continue update database and finally shows a success message. ✓ If admin staff assistant selects delete or send history facility then system shows list of section. <ul style="list-style-type: none"> ○ Admin staff assistant selects section ○ System shows list of employees belonged to the section ○ ○ If admin staff assistant has selected delete facility then press delete the selected button. If send history facility has been selected then press send history button. ○ System asks to confirm delete or send history. ○ If confirmed to delete then system delete the relevant record from the database. If send history is confirmed then system deletes the relevant record and sends this record to a history file. ○ If not confirmed deletion or sending history then the facility ends up.

Table C.16 - Proposed System – Manage Assigning of Employee to Division/Section Information Use Case Description

Use Case Description - Manage Designation Information

Use Case Name	Manage Designation Information
Description	This use case describes how to add/edit/delete designation information.
Actors	Admin Staff Assistant, System.
Pre-Conditions	Designation information should be available at admin staff assistant hand
Post-Conditions	Designation information is available in the system.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin staff assistant requests the facility required (Add/Edit/Delete) to designation information. ✓ System shows the facility that enables add/edit/delete. ✓ If admin staff assistant has selected add facility then system enables to add. ✓ Admin staff assistant enters details. ✓ System checks the validity of data entered. ✓ If valid then the system checks whether same designation's details already exist. ✓ If not exists then system updates data base. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If data entered is invalid then system shows an invalid message. ✓ If designation information already exists then system shows a message that designation information exists. ✓ If admin staff assistant selects edit then system shows list of designation. <ul style="list-style-type: none"> ○ Admin staff assistant selects the designation. ○ System shows the existing content. ○ Admin staff assistant edits information. ○ The system directs to check validity of data entered and continue update database and finally shows a success message. ✓ If admin staff assistant selects delete then system shows list of designation. <ul style="list-style-type: none"> ○ Admin staff assistant selects designation. ○ If designation has not been assigned to any employee then the admin staff assistant specifies to delete. ○ If not system shows a message. ○ System asks admin staff assistant to confirm deletion. ○ If admin staff assistant confirms to delete then system deletes designation and updates database as necessarily and

shows a success message.

Table C.17 - Proposed System –Manage Designation Information Use Case Description

Use Case Description - Manage Grade Information

Use Case Name	Manage grade Information
Description	This use case describes how to add/edit/delete grade information.
Actors	Admin Staff Assistant, System.
Pre-Conditions	grade information should be available at admin staff assistant hand
Post-Conditions	grade information is available in the system.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin staff assistant requests the facility required (Add/Edit/Delete) to grade information. ✓ System shows the facility that enables add/edit/delete. ✓ If admin staff assistant has selected add facility then system enables to add. ✓ Admin staff assistant enters details. ✓ System checks the validity of data entered. ✓ If valid then the system checks whether same grade's details already exist. ✓ If not exists then system updates data base. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If data entered is invalid then system shows an invalid message. ✓ If grade information already exists then system shows a message that grade information exists. ✓ If admin staff assistant selects edit then system shows list of grades. <ul style="list-style-type: none"> ○ Admin staff assistant selects the grade. ○ System shows the existing content. ○ Admin staff assistant edits information. ○ The system directs to check validity of data entered and continue update database and finally shows a success message. ✓ If admin staff assistant selects delete then system shows list of grades. <ul style="list-style-type: none"> ○ Admin staff assistant selects grade. ○ If designation has not been assigned to any employee then the admin staff assistant specifies to delete.

- If not system shows a message.
- System asks admin staff assistant to confirm deletion.
- If admin staff assistant confirms to delete then system deletes grade and updates database as necessarily and shows a success message.

Table C.18 - Proposed System – Manage Grade Information Use Case Description

Use Case Description - View / Print Reports of Employee Recruitment

Use Case Name	View / Print Reports
Description	<p>This use case describes process of view / prints various types of reports. These reports are ;</p> <ol style="list-style-type: none"> 01 Job Appointment Accepted List 02 Personnel File No List 03 Employee General Information 04 Employee Dependency Information Employee Current Working Division/Section 05 Employee Working History 06 Employee List - Division wise 07 Employee List - Section wise 08 Employee List - Grade wise 09 Employee List - Designation wise 10 Employee List - Category wise 11 Division List 12 Division wise Section List 13 Designation List 14 Grade List
Actors	System User, System
Pre-Conditions	Relevant use case should have been implemented.
Post-Conditions	Relevant report is viewed or printed.
Flow of Events	<ul style="list-style-type: none"> ✓ System clerk requests for view / print reports. ✓ System shows the facility that enables viewing / printing reports. ✓ System display list of all pre defined reports. ✓ System user selects the required report. ✓ System user selects the relevant vacancy. ✓ If vacancy exists then system extracts all required data from the



	database. ✓ System prepares and displays the report. ✓ System user decides whether to print/not print displayed report. ✓ If decided to print then system prints the report.
Exceptions	✓ If vacancy does not exist then admin clerk has to close the facility being used and make sure to enter vacancy information. ✓ If system user does not decide to print then print facility ends up.

Table C.19 - Proposed System – View / Print Reports of Employee Recruitment Use Case Description

Use Case Description - Manage EPF Information

Use Case Name	Manage EPF information.
Description	This use case describes how to keep EPF information of employees
Actors	Admin Clerk, System.
Pre-Conditions	Employee should have been entered to the system.
Post-Conditions	Relevant EPF information has been updated.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin clerk requests for the facility to manage employee's EPF information. ✓ System shows the facility that to enter EPF information of employees. ✓ System checks whether EPF information of employees is already existed. ✓ If such information exists then system shows list of employees with EPF content so that these can be edited. ✓ Admin clerk enter information ✓ System checks validity of data entered. ✓ If valid, System updates database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If such information does not exist then system shows list of employees so that information can be added. ✓ If data entered is invalid, system shows an invalid message.

Table C.20 - Proposed System –Manage EPF Information Use Case Description

Use Case Description - Manage ETF Information

Use Case Name	Manage ETF information.
Description	This use case describes how to keep ETF information of employees
Actors	Admin Clerk, System.

Pre-Conditions	Employee should have been entered to the system.
Post-Conditions	Relevant ETF information has been updated.
Flow of Events	<ul style="list-style-type: none"> ✓ Admin clerk requests for the facility to manage employee's ETF information. ✓ System shows the facility that to enter ETF information of employees. ✓ System checks whether ETF information of employees is already existed. ✓ If such information exists then system shows list of employees with ETF content so that these can be edited. ✓ Admin clerk enter information ✓ System checks validity of data entered. ✓ If valid, System updates database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If such information does not exist then system shows list of employees so that information can be added. ✓ If data entered is invalid, system shows an invalid message.

Table C.21 - Proposed System –Manage ETF Information Use Case Description

Use Case Description – View / Print Reports of EPF/ETF Handling



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Use Case Name	View / Print Reports
Description	<p>This use case describes process of view / prints various types of reports.</p> <p>These reports are ;</p> <ul style="list-style-type: none"> 01 EPF File No List (EPF NO) 02 EPF Forms (A B H) Received from Employee 03 EPF Forms sent to Labor Department 04 EPF Form B Received from Labor Department 05 ETF K Certified List 06 Employee Job Status Information (Retired / Terminated / Suspended)
Actors	System User, System
Pre-Conditions	Relevant use case should have been implemented.
Post-Conditions	Relevant report is viewed or printed.

Flow of Events	<ul style="list-style-type: none"> ✓ System clerk requests for view / print reports. ✓ System shows the facility that enables viewing / printing reports. ✓ System display list of all pre defined reports. ✓ System user selects the required report. ✓ System user selects the relevant vacancy. ✓ If vacancy exists then system extracts all required data from the database. ✓ System prepares and displays the report. ✓ System user decides whether to print/not print displayed report. ✓ If decided to print then system prints the report.
Exceptions	<ul style="list-style-type: none"> ✓ If vacancy does not exist then admin clerk has to close the facility being used and make sure to enter vacancy information. ✓ If system user does not decide to print then print facility ends up.

Table C.22 - Proposed System –View / Print Reports of EPF/ETF Handling Use Case Description

Use Case Description – Manage User Category Information

Use Case Name	Manage User Category Information
Description	This use case describes how to add/edit/delete User Category information.
Actors	System Administrator, System
Pre-Conditions	User Category information should have been identified.
Post-Conditions	User Category information has been updated.
Flow of Events	<ul style="list-style-type: none"> ✓ System administrator requests the facility required (Add/Edit/Delete) to manage user category information. ✓ System shows the facility required. ✓ If select add then system enables to add information. ✓ System administrator enters user category information. ✓ System checks the validity of data entered. ✓ If valid then system checks whether user category information already exists. ✓ If user category information not exist then system update database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If data entered is invalid, System shows an invalid message. ✓ If user category information already exists then system shows a message that user category information exists. ✓ If System administrator selects edit then system shows user category list <ul style="list-style-type: none"> ○ System administrator selects user category. ○ System shows the existing content.

	<ul style="list-style-type: none"> ○ System administrator edits information. ○ The system directs to check validity of data entered and continues to update database and finally shows a success message. <p>✓ If System administrator selects delete then system shows user categories list.</p> <ul style="list-style-type: none"> ○ System administrator selects user category. ○ System checks system users are already existed for the selected user category. ○ If system users' information does not exist for the selected user category then the system administrator specifies to delete. ○ If not show a message. ○ System asks system administrator to confirm deletion. ○ If System administrator confirms to delete then system deletes user category and updates database as necessarily and shows a success message.
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Table C.23 - Proposed System –Manage User Category Information Use Case Description



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Use Case Description - Manage System Facility Information

Use Case Name	Manage System Facility Information
Description	This use case describes how to add/edit/delete System Facility information.
Actors	System Administrator, System
Pre-Conditions	System Facility information should have been identified.
Post-Conditions	System Facility information has been updated.
Flow of Events	<ul style="list-style-type: none"> ✓ System Administrator requests the facility required (Add/Edit/Delete) to manage user category information. ✓ System shows the facility required. ✓ If select add then system enables to add information. ✓ System Administrator enters user category information. ✓ System checks the validity of data entered. ✓ If valid then system checks whether user category information already exists. ✓ If user category information not exist then System update database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If data entered is invalid, System shows an invalid message.

	<ul style="list-style-type: none"> ✓ If system facility already exists then system shows a message that system facility exists. ✓ If system administrator selects edit then system shows list of system facility. <ul style="list-style-type: none"> ○ System administrator selects system facility. ○ System shows the existing content. ○ System administrator edits information. ○ The system directs to check validity of data entered and continues to update database and finally shows a success message. ✓ If system administrator selects delete then system shows system facilities list. <ul style="list-style-type: none"> ○ System administrator selects system facility. ○ System checks user categories are already existed for the system facility selected ○ If user categories information does not exist for the selected system facility then the system administrator specifies to delete. <ul style="list-style-type: none"> ○ If not show a message. ○ System asks system administrator to confirm deletion. ○ If system administrator confirms to delete then system deletes system facility and updates database as necessarily and shows a success message.
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Table C.24 - Proposed System – Manage System Facility Information Use Case Description

Use Case Description - Assign System Facilities to User Category

Use Case Name	Assign System Facilities to User Category
Description	This use case describes steps of assigning of system facilities to a selected user category.
Actors	System Administrator, System
Pre-Conditions	System facilities and user categories should have been entered to the system
Post-Conditions	Systems facilities have been assigned to the selected user category.
Flow of Events	<ul style="list-style-type: none"> ✓ System administrator requests for the facility. ✓ System shows the facility. ✓ System administrator selects the user category. ✓ If user category exists then system checks whether system

	<p>facilities are already assigned to the selected user category.</p> <ul style="list-style-type: none"> ✓ If assigned then system displays content. ✓ System administrator assigns system facilities. ✓ System checks validity of data entered. ✓ If valid, System updates database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If user category does not exist then system administrator has to close the facility being used and make sure to enter user category information. ✓ If system facilities are already assigned to the selected user category then system displays a empty page with list of all facilities.. ✓ If data entered is invalid, System shows an invalid message.

Table C.25 - Proposed System –Assign System Facilities to User Category Use Case Description

Use Case Description – Manage System User Account Information

Use Case Name	Manage System User Account Information
Description	This use case describes how to add/edit/delete system user account information.
Actors	System administrator, System
Pre-Conditions	System user account information should have been identified.
Post-Conditions	System user account information has been updated.
Flow of Events	<ul style="list-style-type: none"> ✓ System administrator requests the facility required (Add/Edit/Delete) to manage system user account information. ✓ System shows the facility required. ✓ If select add then system enables to add information. ✓ System administrator enters system user account information. ✓ System checks the validity of data entered. ✓ If valid then system checks whether system user account information already exists. ✓ If system user account information not exist then system update database. ✓ System shows a success message.
Exceptions	<ul style="list-style-type: none"> ✓ If data entered is invalid, System shows an invalid message. ✓ If system user account already exists then system shows a message that system user account exists. ✓ If system administrator selects edit then select system user account. <ul style="list-style-type: none"> ○ System shows the existing content.

	<ul style="list-style-type: none"> ○ System administrator edits information. ○ The system directs to check validity of data entered and continues to update database and finally shows a success message. <p>✓ If system administrator selects delete then system shows system user accounts list.</p> <ul style="list-style-type: none"> ○ System administrator selects system user account. ○ The System administrator specifies to delete. ○ System asks system administrator to confirm deletion. ○ If System administrator confirms to delete then system deletes system user account and updates database as necessarily and shows a success message.
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Table C.26 - Proposed System –Manage System User Account Information Use Case Description

Use Case Description – View / Print Reports of System Administration

Use Case Name	View / Print Reports
Description	<p>This use case describes process of view / prints various types of reports.</p> <p>These reports are ;</p> <ul style="list-style-type: none"> ✓ System Users of the system ✓ User Category Information ✓ System Facility Information ✓ System User login information
Actors	System User, System
Pre-Conditions	Relevant use case should have been implemented.
Post-Conditions	Relevant report is viewed or printed.
Flow of Events	<ul style="list-style-type: none"> ✓ System clerk requests for view / print reports. ✓ System shows the facility that enables viewing / printing reports. ✓ System display list of all pre defined reports. ✓ System user selects the required report. ✓ System extracts all required data from the database. ✓ System prepares and displays the report. ✓ System user decides whether to print/not print displayed report. ✓ If decided to print then system prints the report.
Exceptions	<ul style="list-style-type: none"> ✓ If system user does not decide to print then print facility ends up.

Table C.27 - Proposed System – View / Print Reports of System Administration Use Case Description

Log in

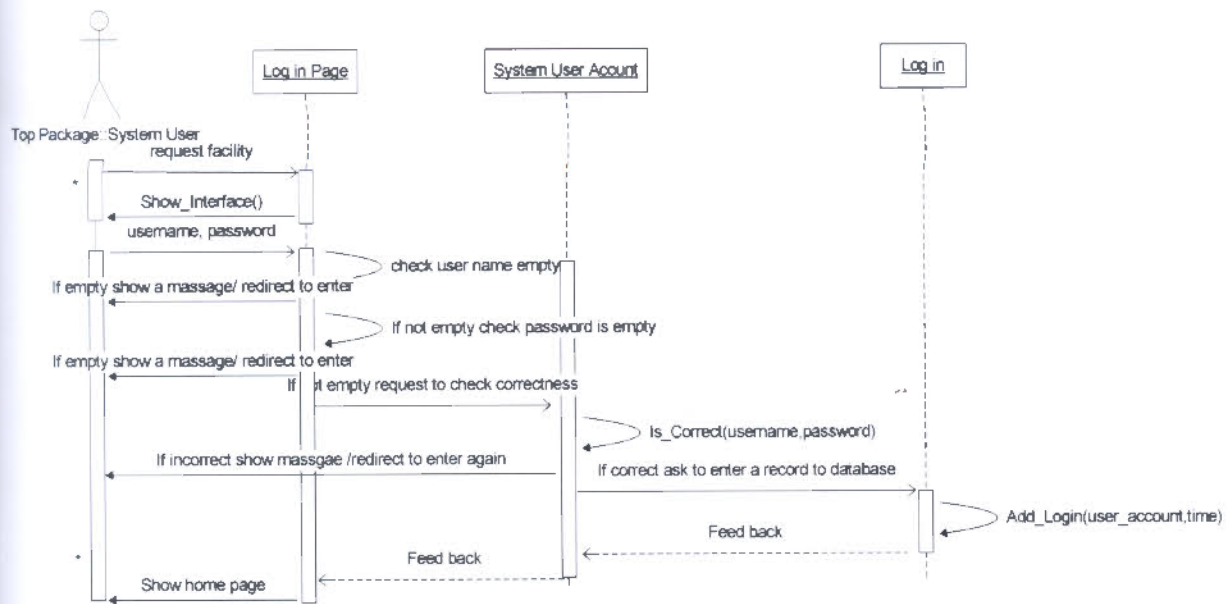


Figure D.1- Sequence Diagram – Log in

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Manage Vacancy Information (Add)

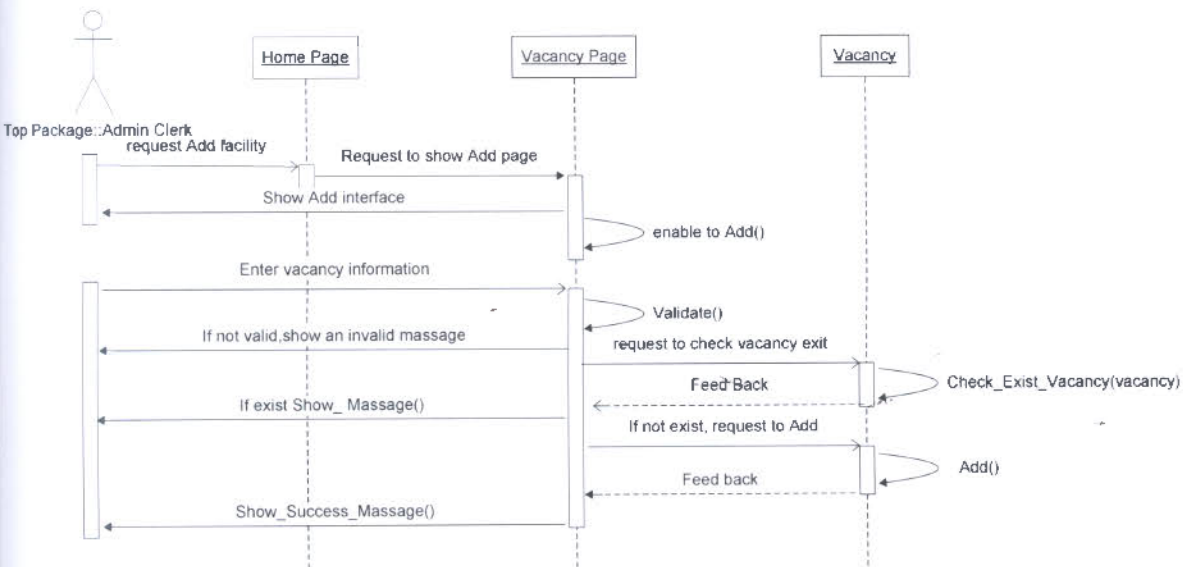


Figure D.2- Sequence Diagram – Manage Vacancy Information (Add)

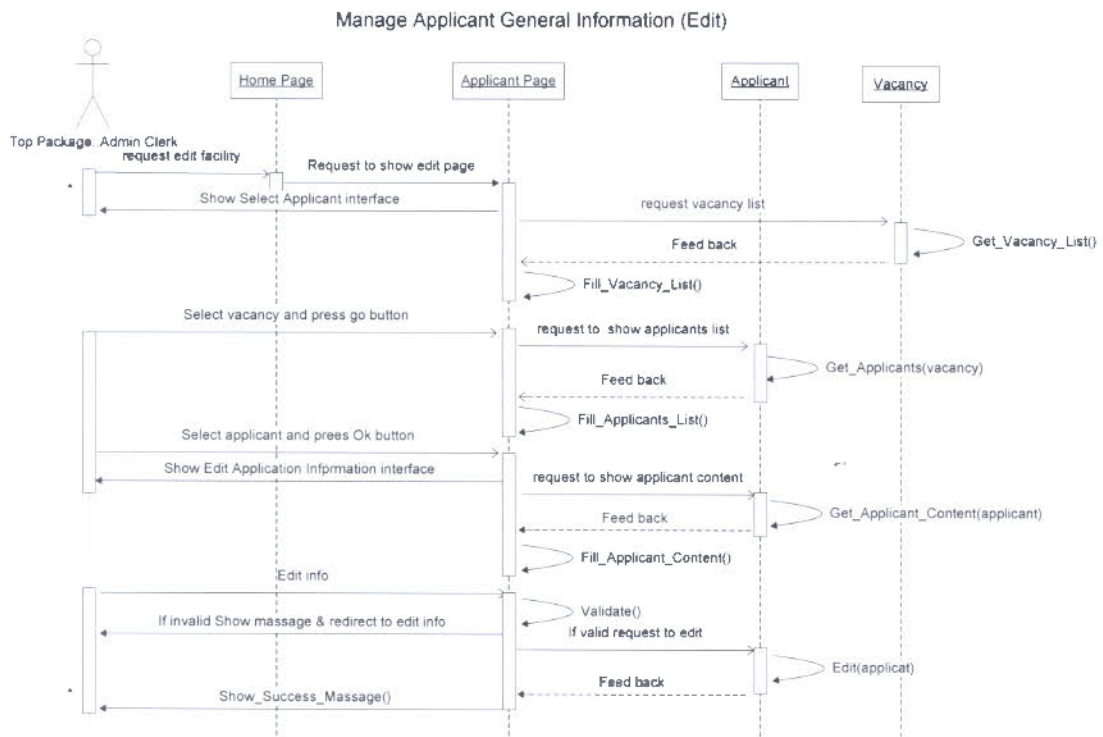


Figure D.3- Sequence Diagram – Manage Vacancy Information (Edit)

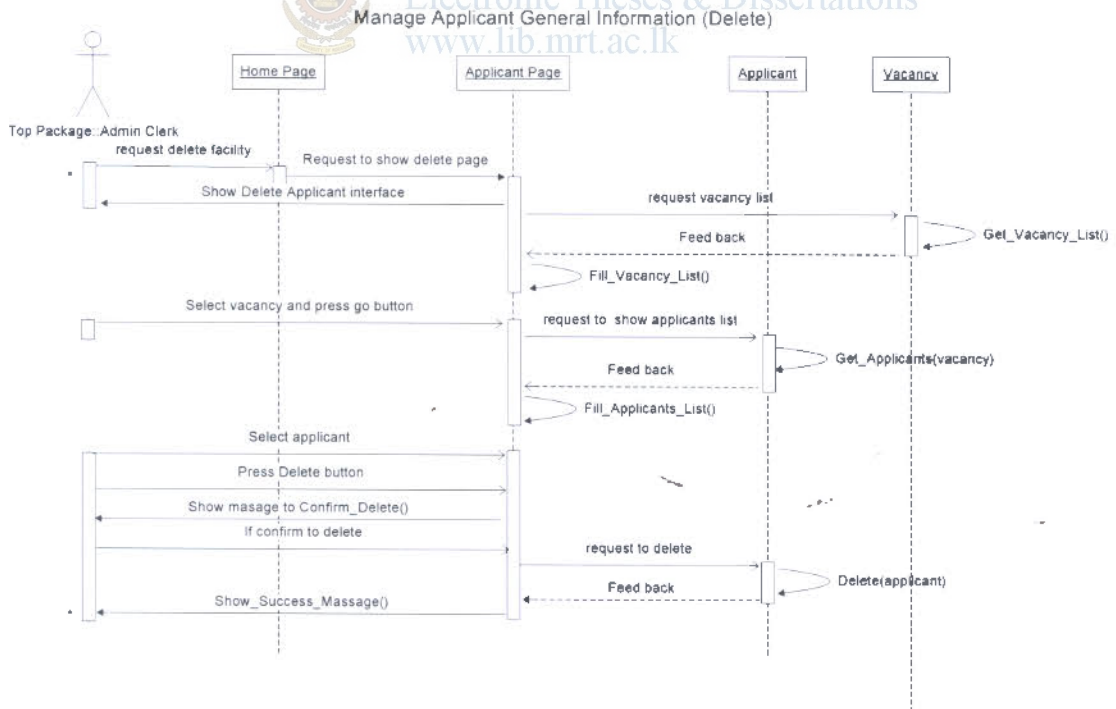


Figure D.4- Sequence Diagram – Manage Vacancy Information (Delete)

Manage Applicant General Information (Add)

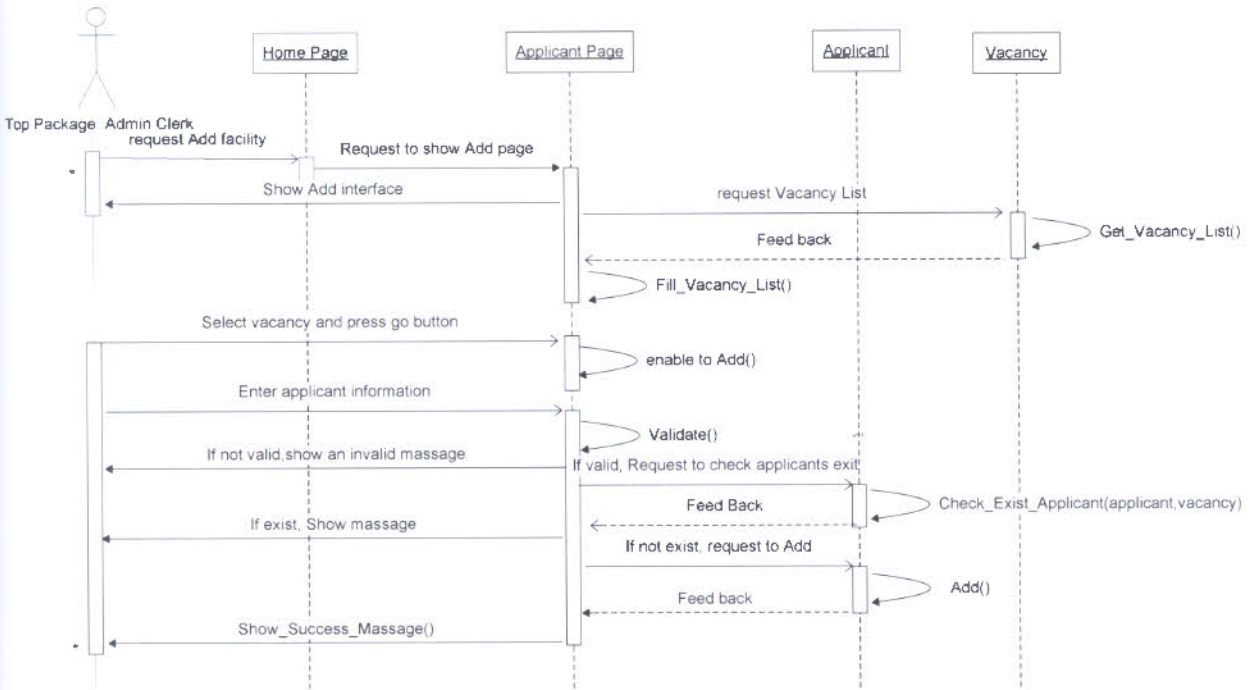


Figure D.5- Sequence Diagram – Manage Applicant General information(Add)

Manage Applicant General Information (Edit)

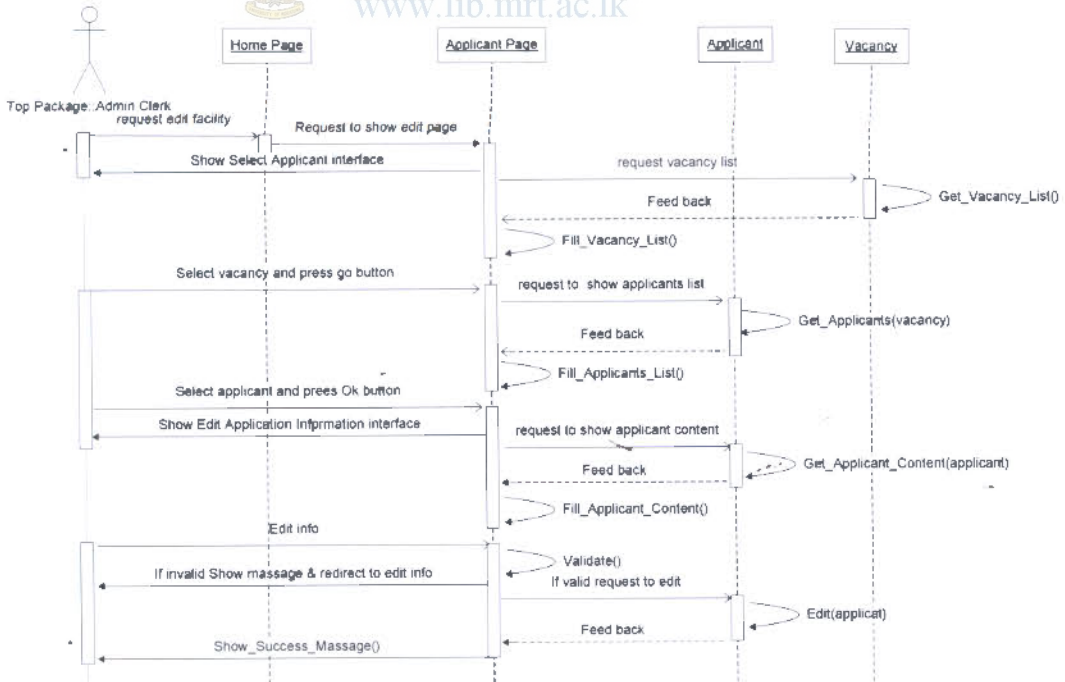


Figure D.6- Sequence Diagram – Manage Applicant General information(Edit)

Manage Applicant General Information (Delete)

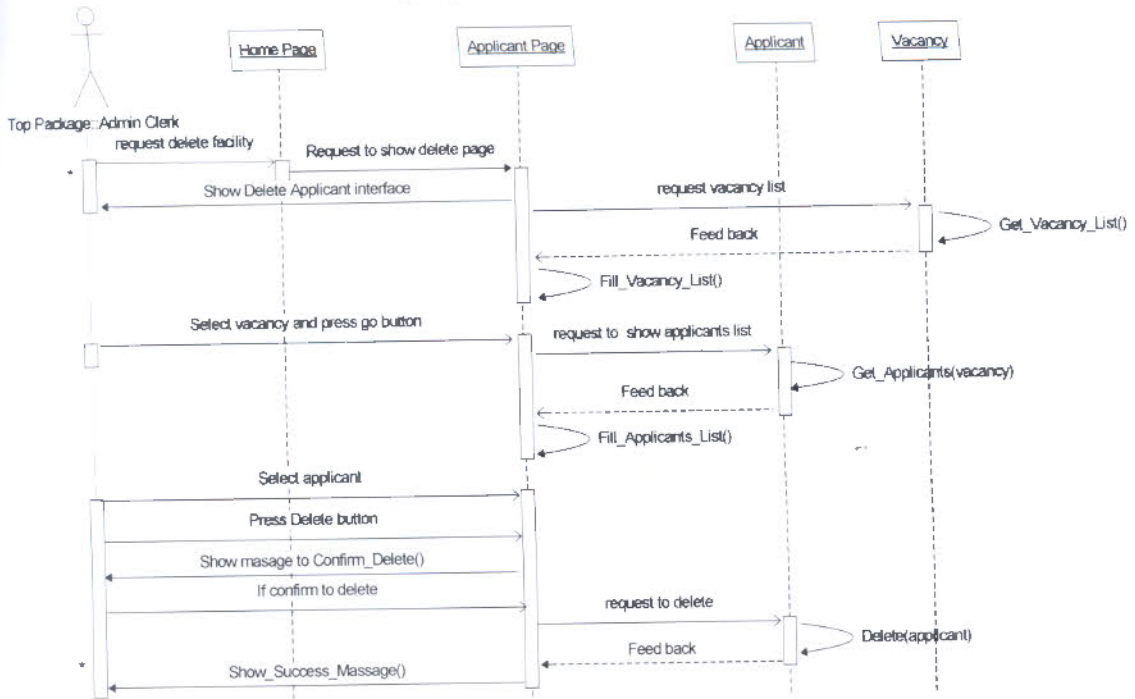


Figure D.7- Sequence Diagram – Manage Applicant General information(Delete)

Generate Admission Cards

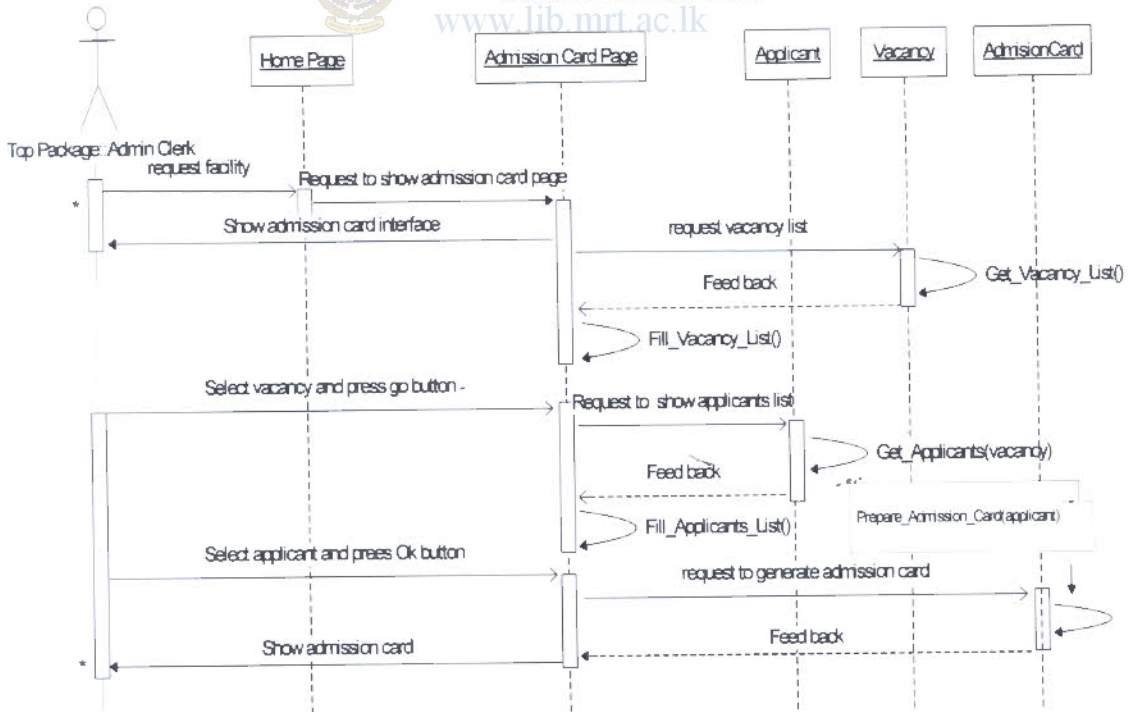


Figure D.8- Sequence Diagram – Generate Admission Cards

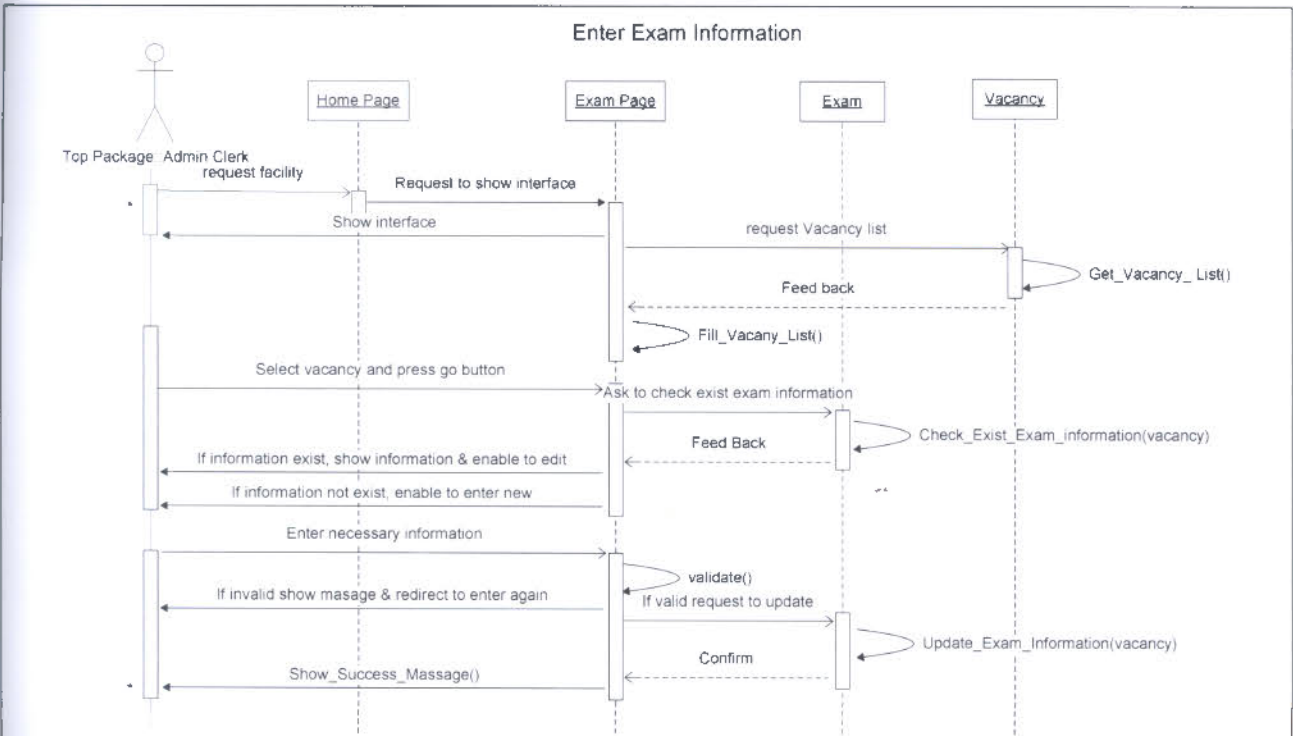


Figure D.9- Sequence Diagram – Enter Exam Information

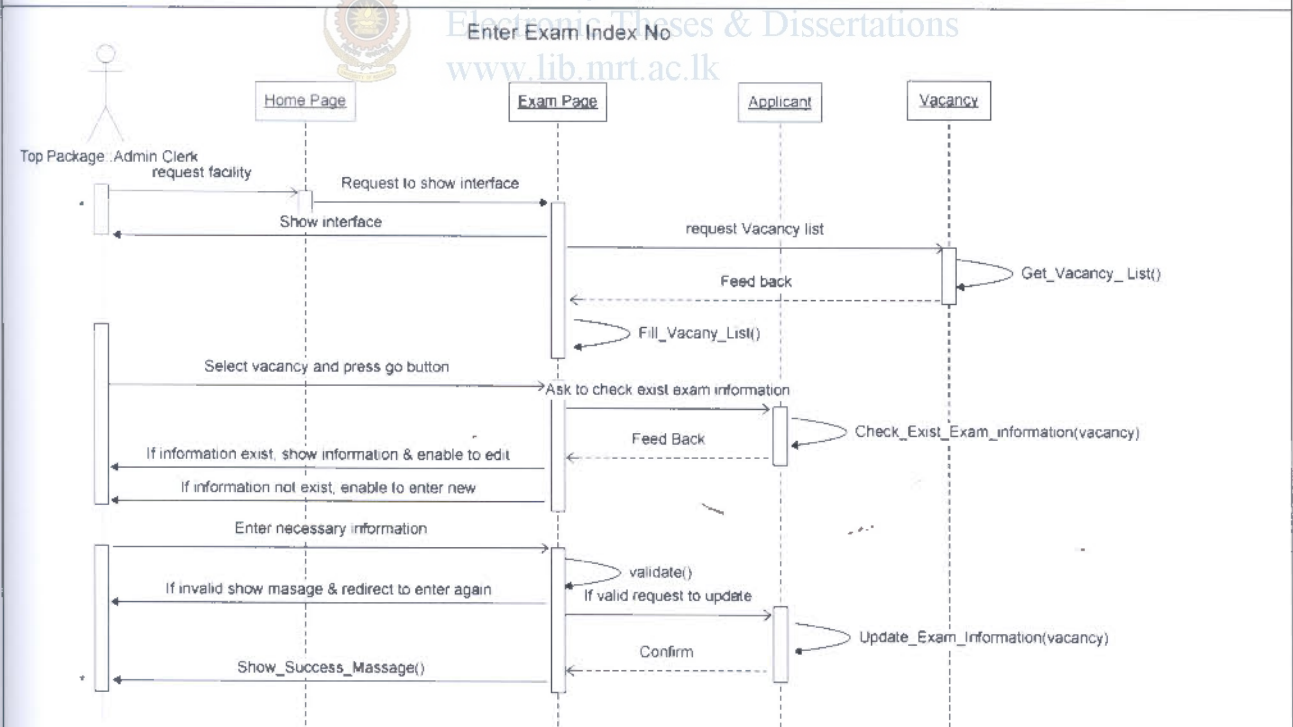


Figure D.10- Sequence Diagram – Enter Exam Index No



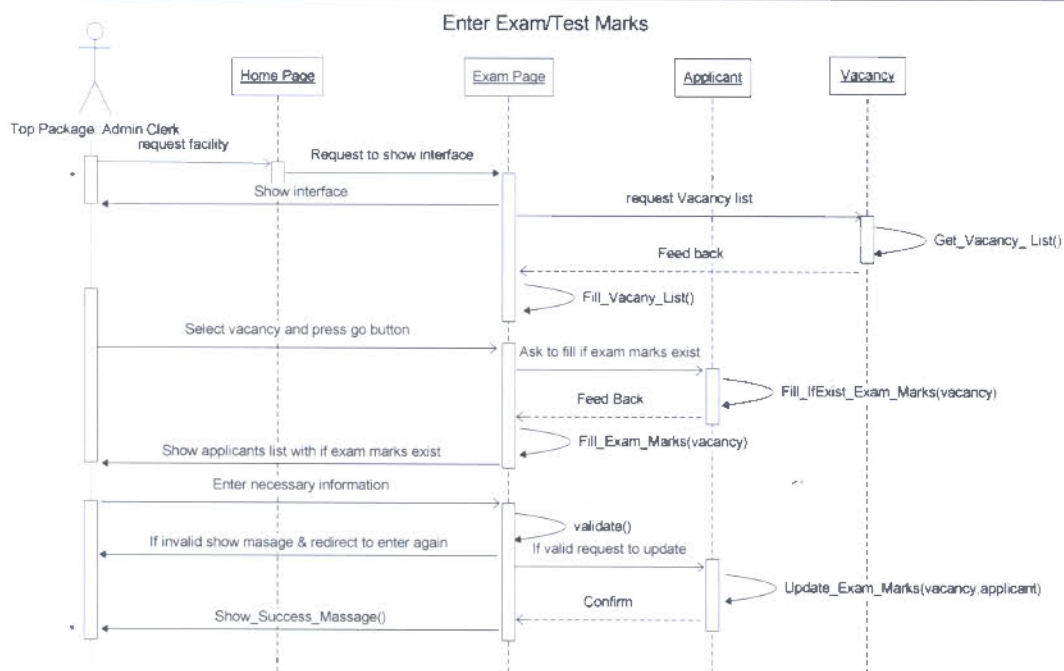


Figure D.11- Sequence Diagram – Enter Exam/Test Marks



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Enter Final Evaluation Records

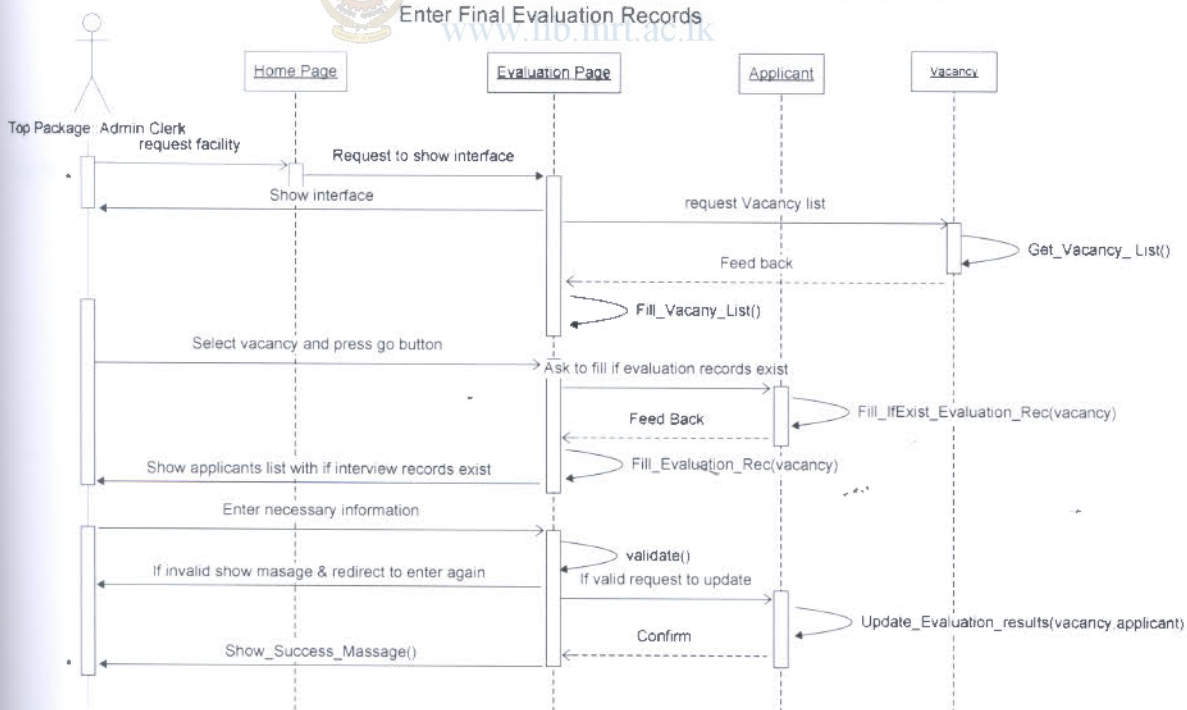


Figure D.12- Sequence Diagram – Manage Enter Final Evaluation Records

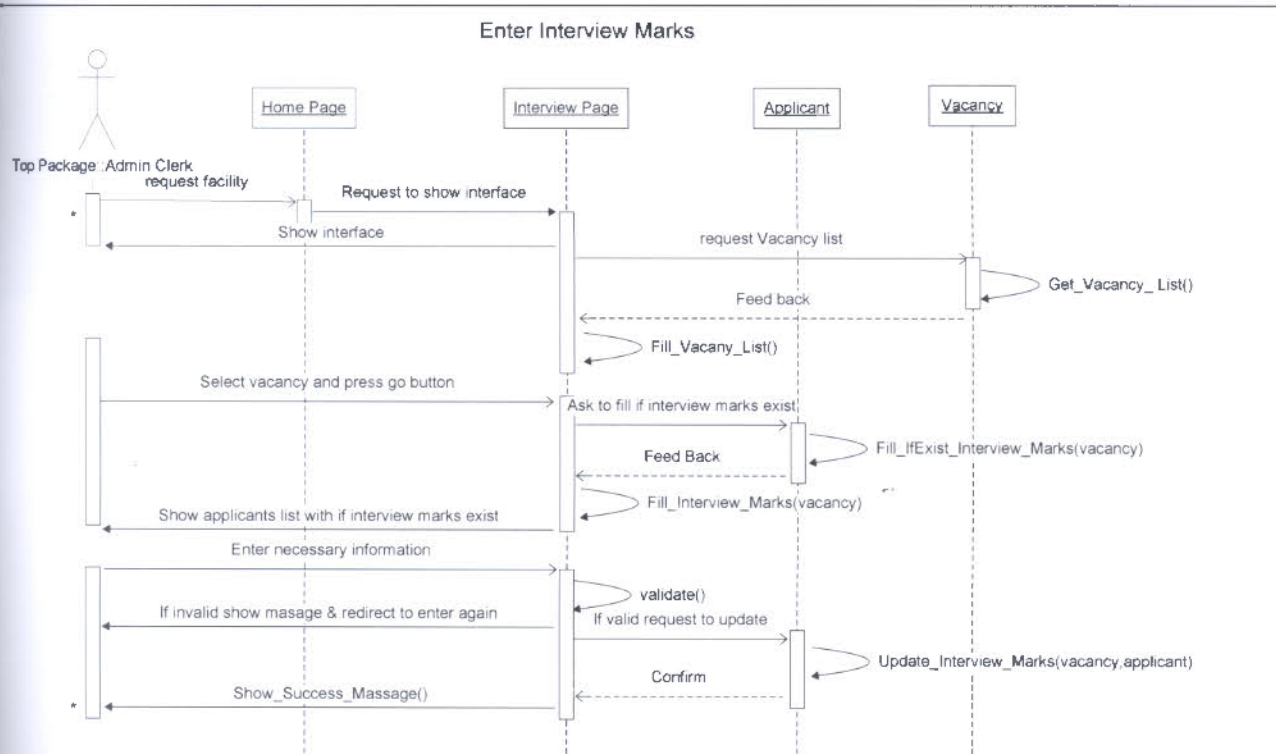


Figure D.13- Sequence Diagram – Enter Interview Marks
 Employee Selection - View / Print Reports

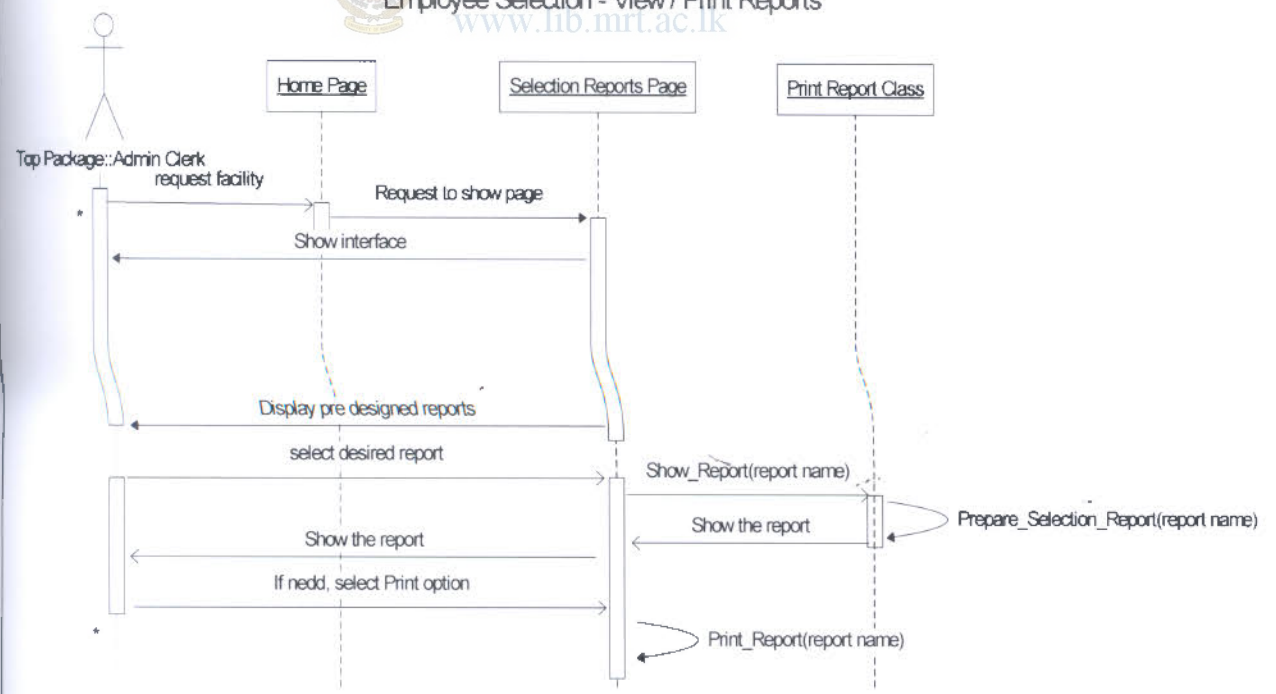


Figure D.14- Sequence Diagram – View / Print Reports of Employee Selection

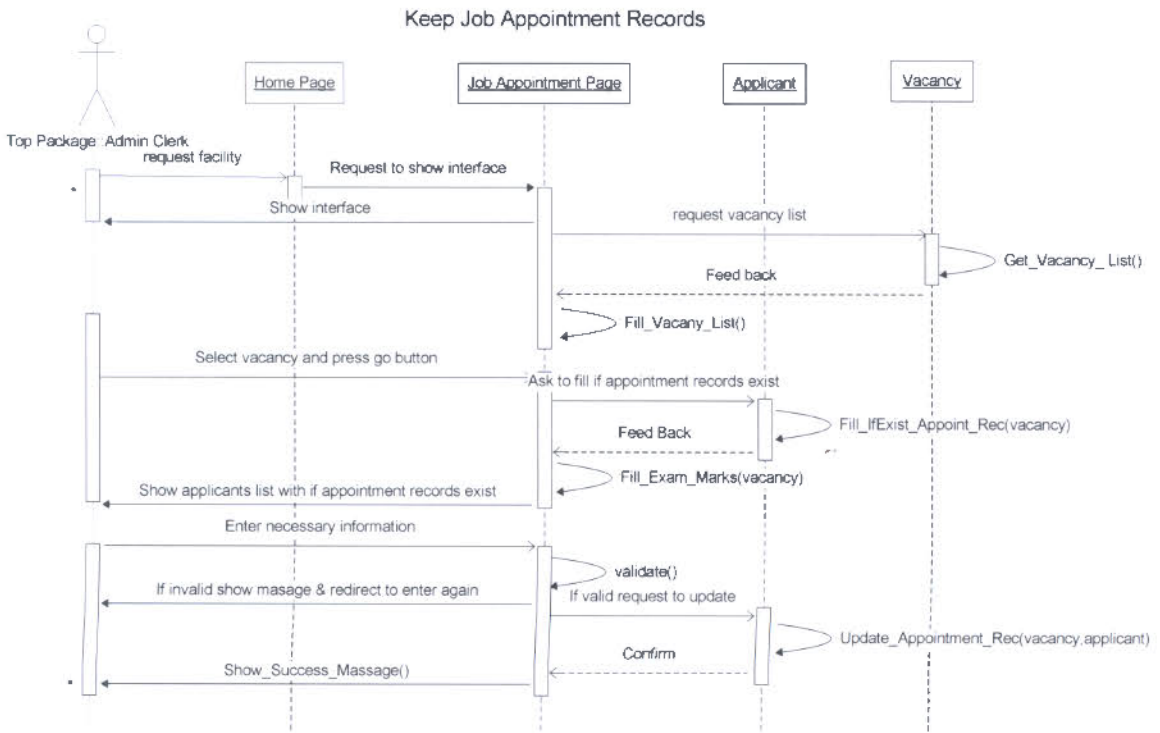


Figure D.15- Sequence Diagram – Keep Job Appointment Records

Manage Employee's General Information (Add)

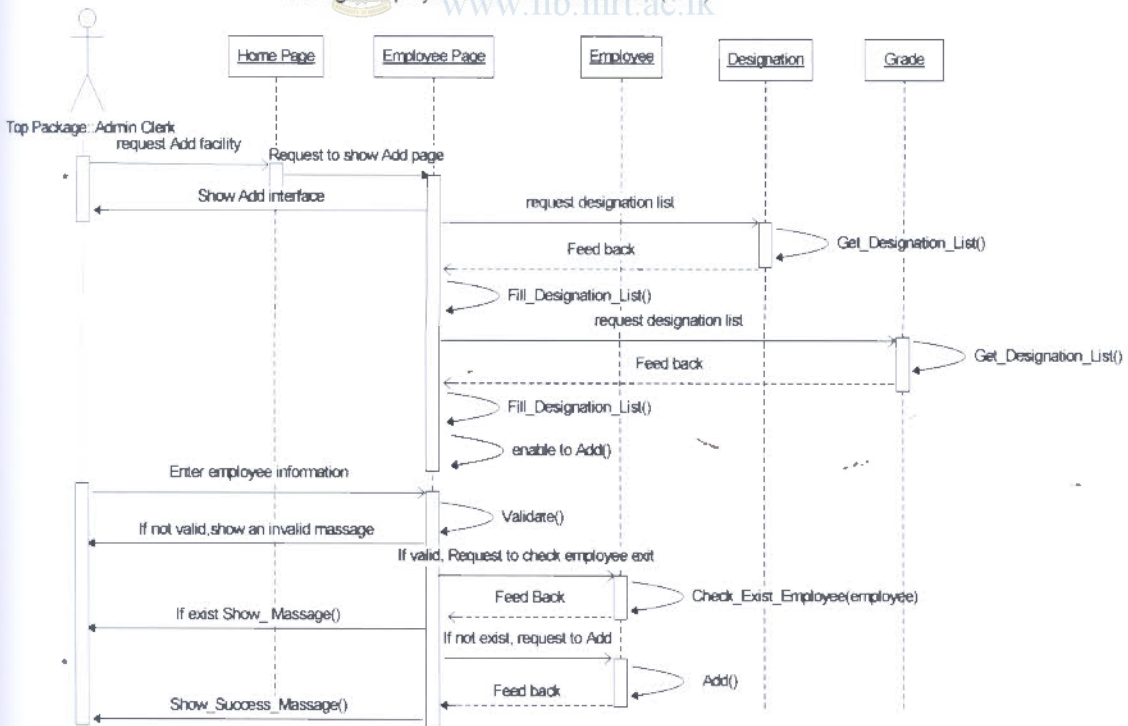


Figure D.16- Sequence Diagram – Manage employee's General Information (Add)

Manage Employee's General Information (Edit)

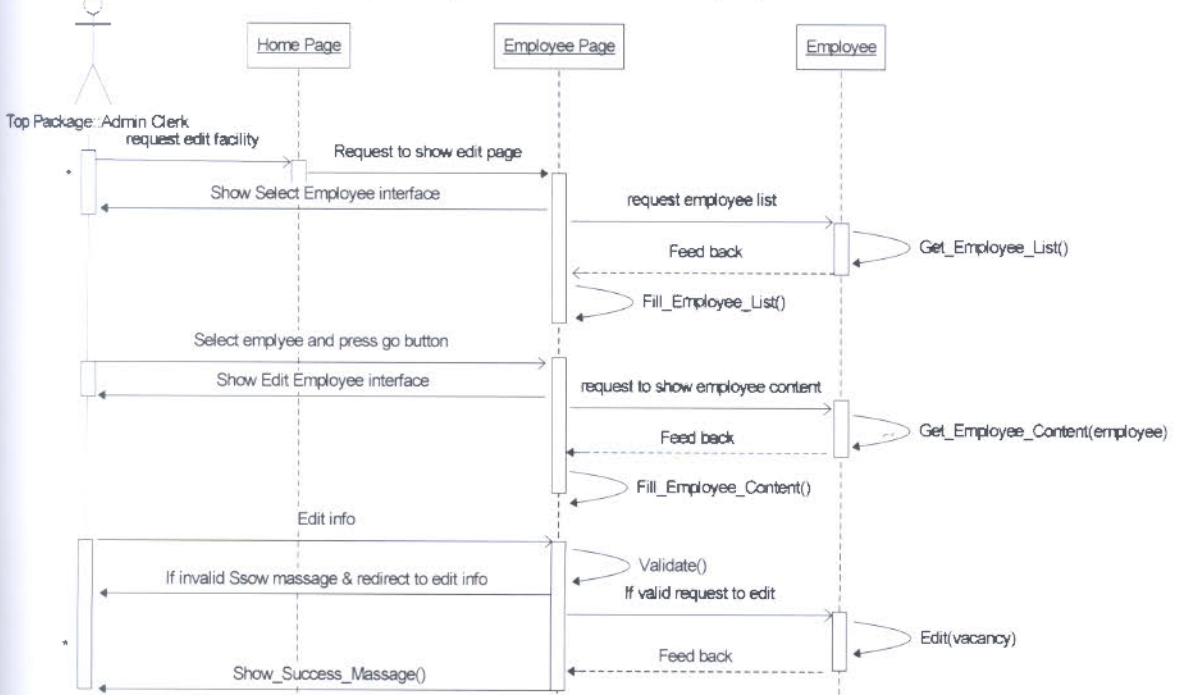


Figure D.17- Sequence Diagram – Manage employee's General Information (Edit)

Manage Dependent Information (Add)

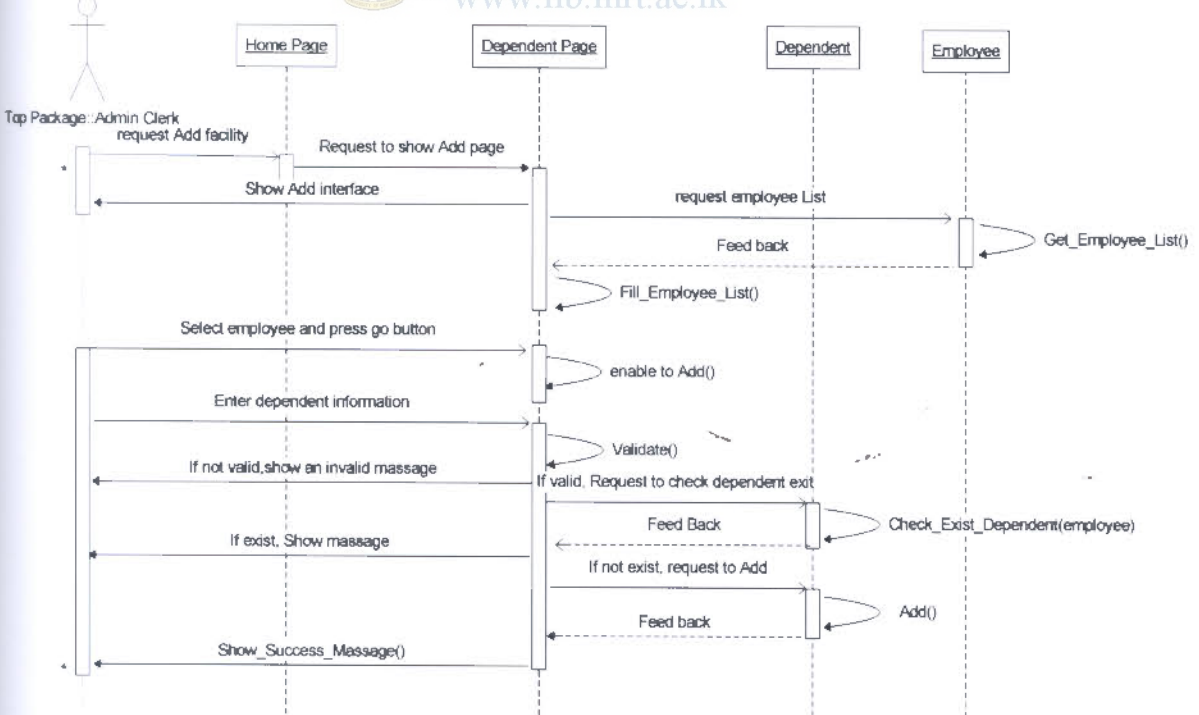


Figure D.18- Sequence Diagram – Manage Dependent Information (Add)

Manage Dependent Information (Edit)

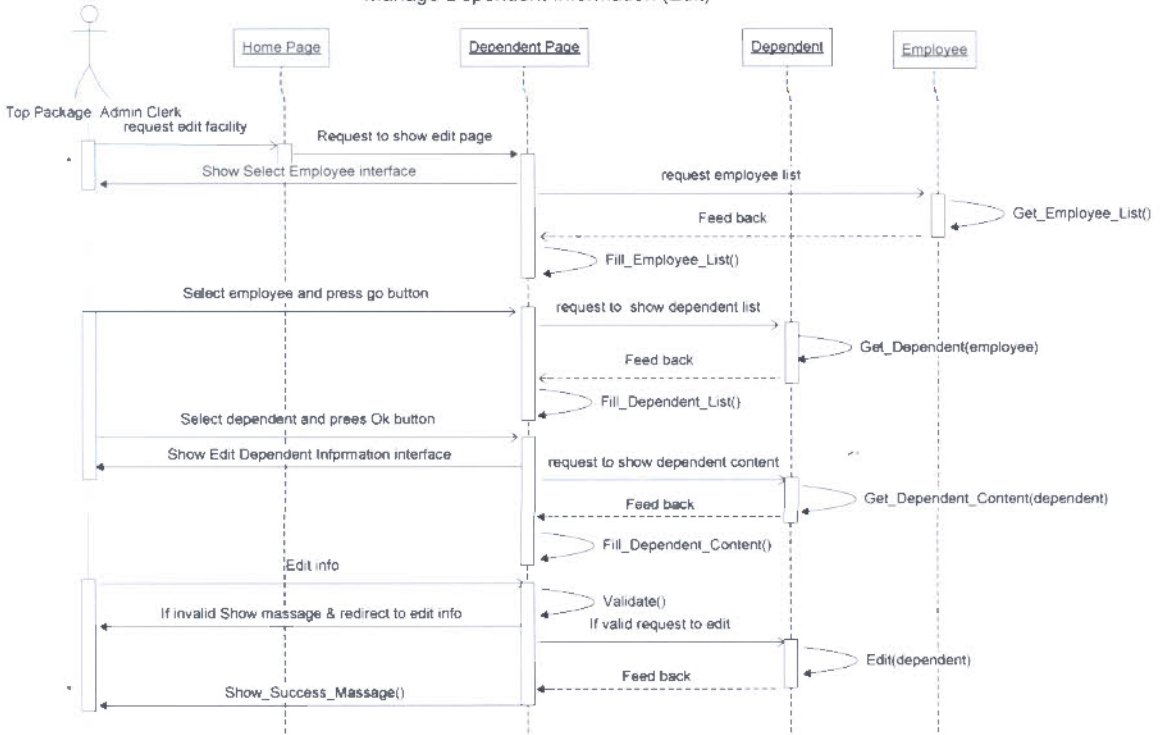


Figure D.19- Sequence Diagram – Manage Dependent Information (Edit)

Manage Dependent Information (Delete)

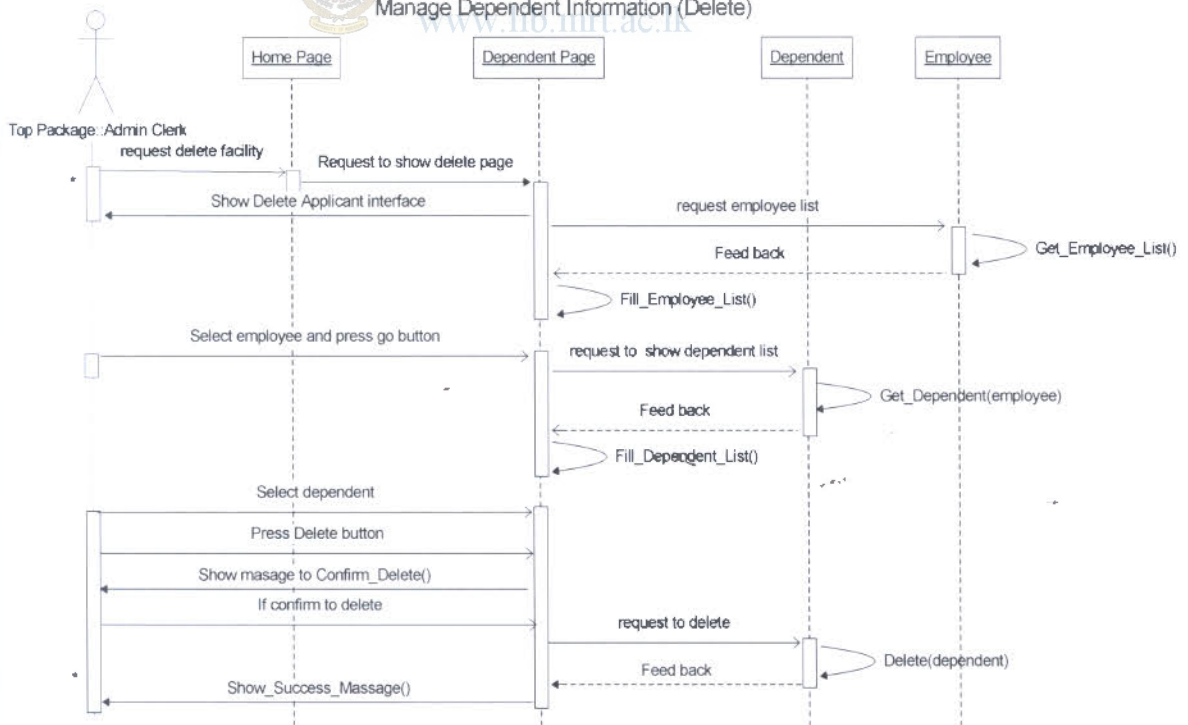


Figure D.21- Sequence Diagram – Manage Dependent information (Delete)

Manage Division Information (Add)

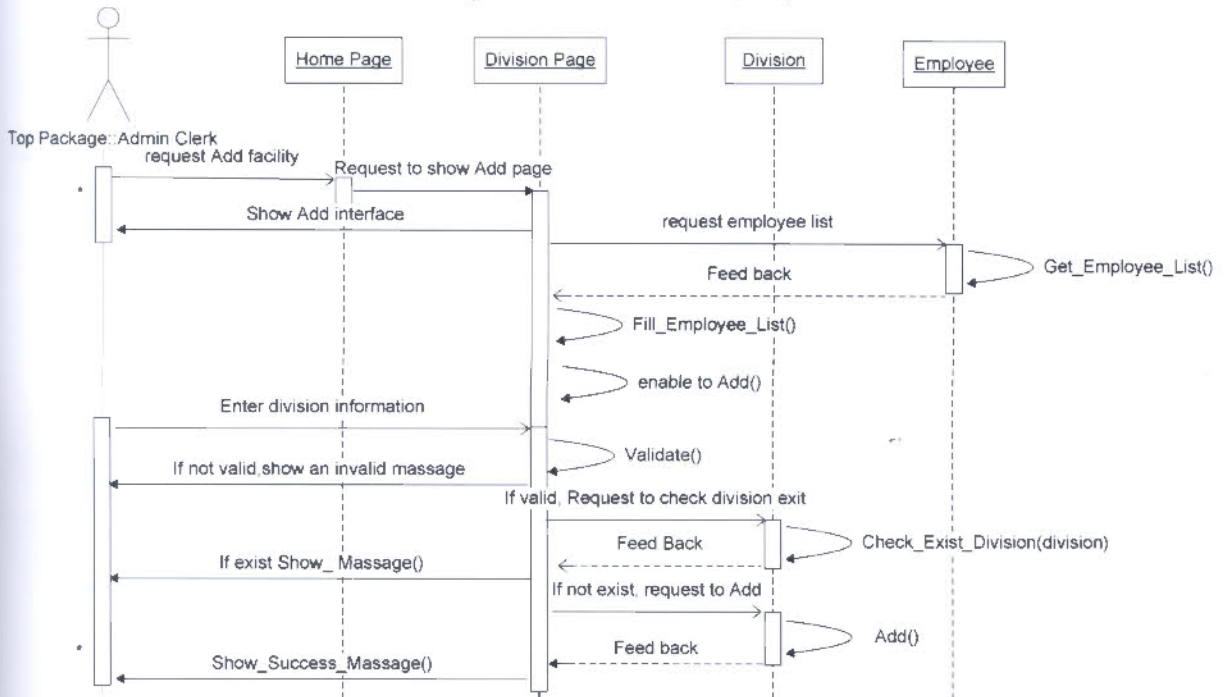


Figure D.20- Sequence Diagram – Manage Division Information (Add)

Manage Division Information (Edit)

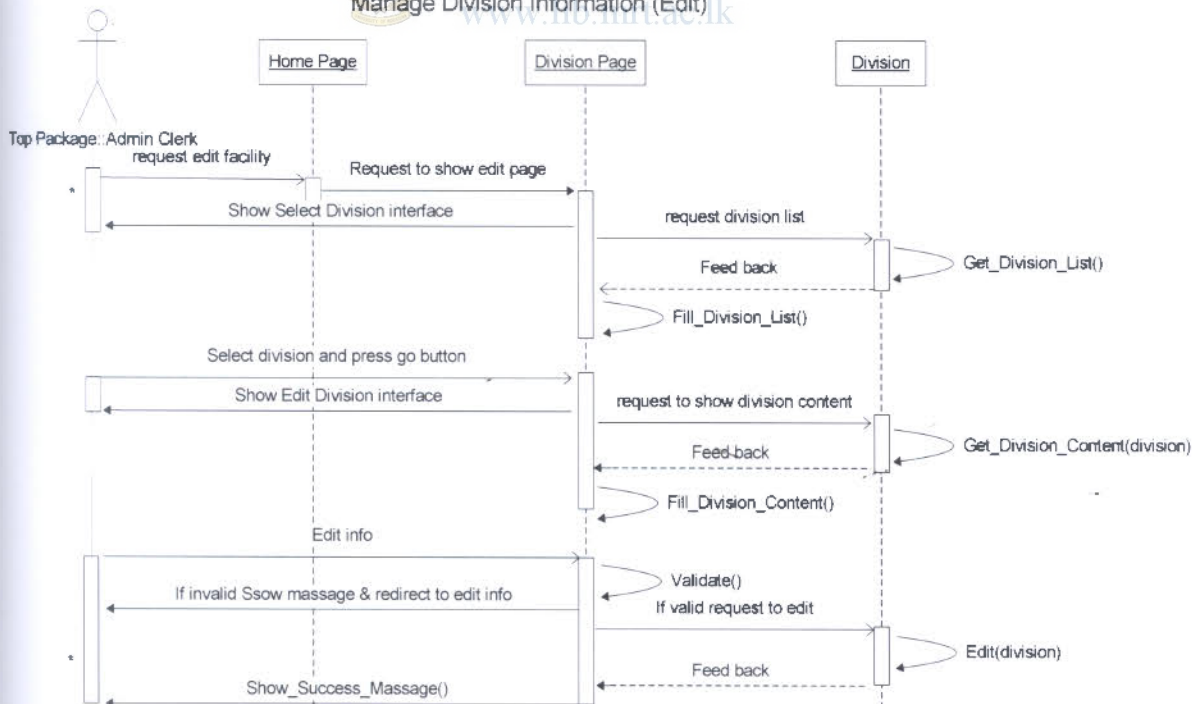


Figure D.22- Sequence Diagram – Manage Division Information (Edit)

Manage Division Information (Delete)

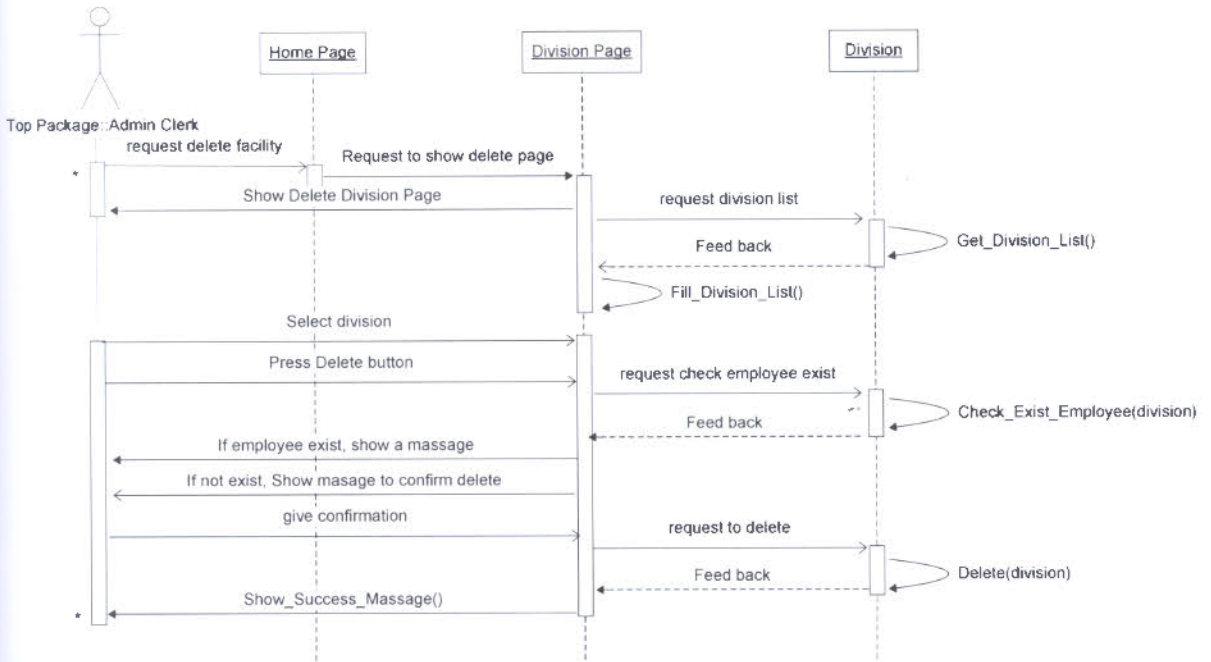


Figure D.23- Sequence Diagram – Manage Division Information (Delete)

Manage Section Information (Add)

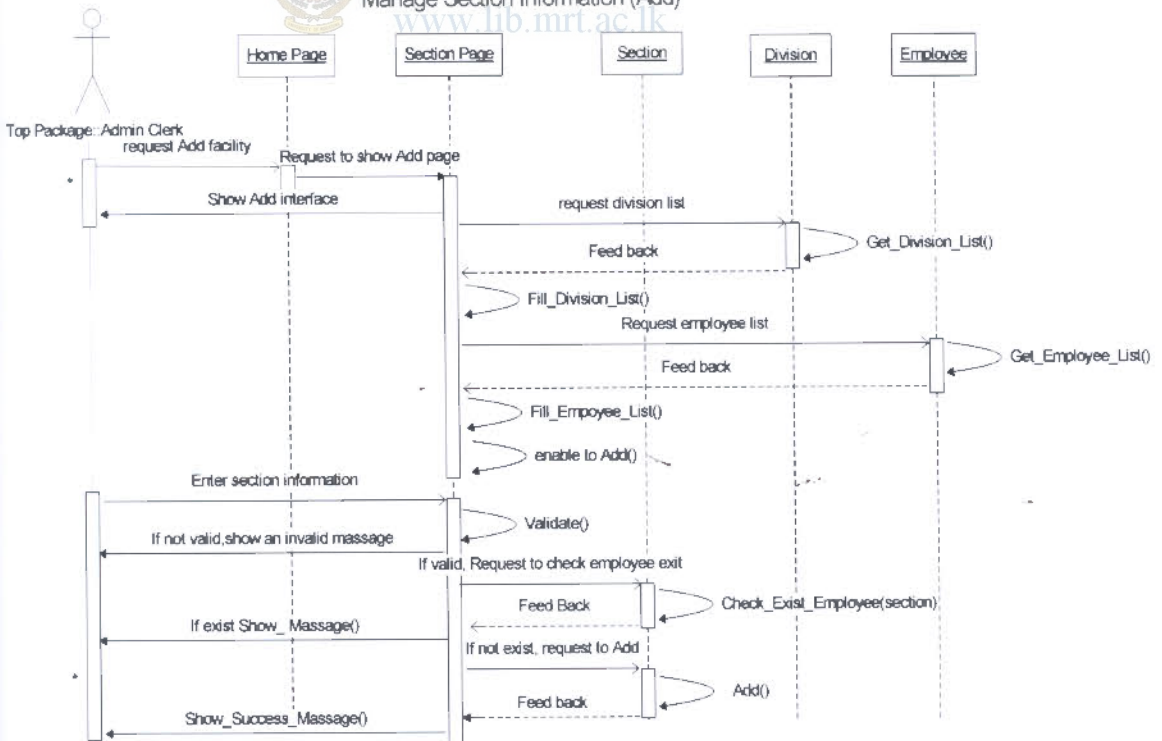


Figure D.24- Sequence Diagram – Manage Section Information (Add)

Manage Section Information (Edit)

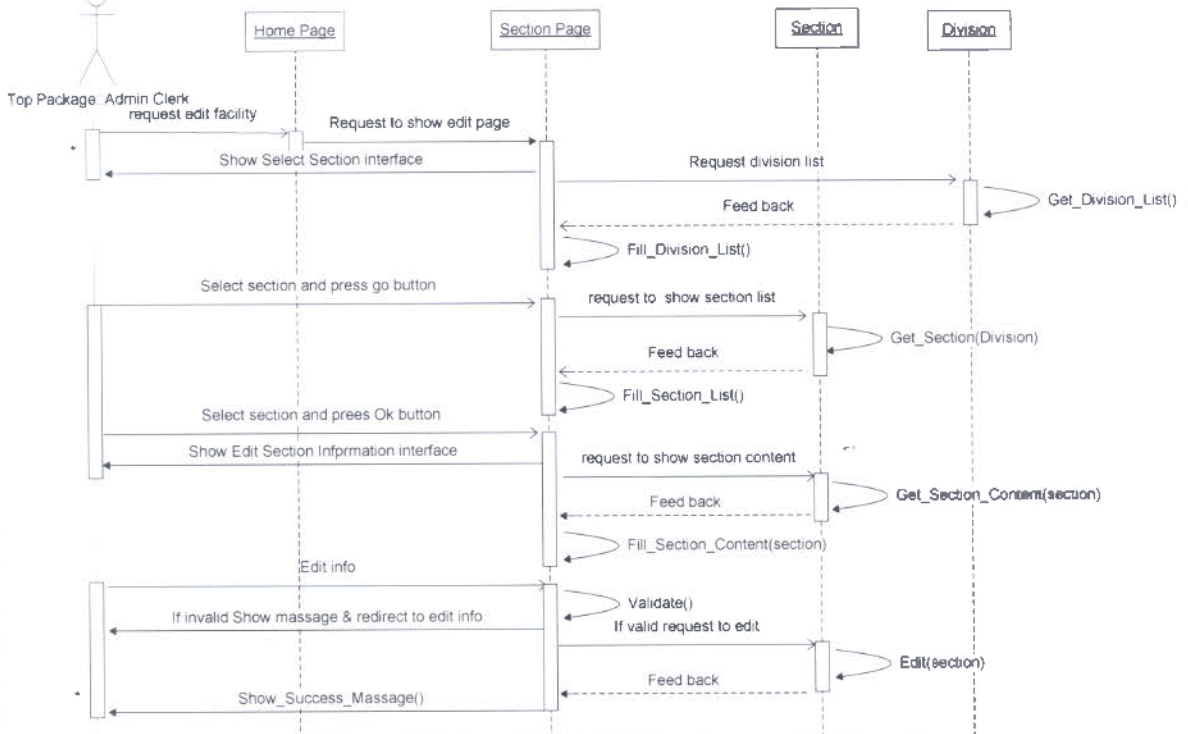


Figure D.25- Sequence Diagram – Manage Section Information (Edit)

Manage Section Information (Delete)

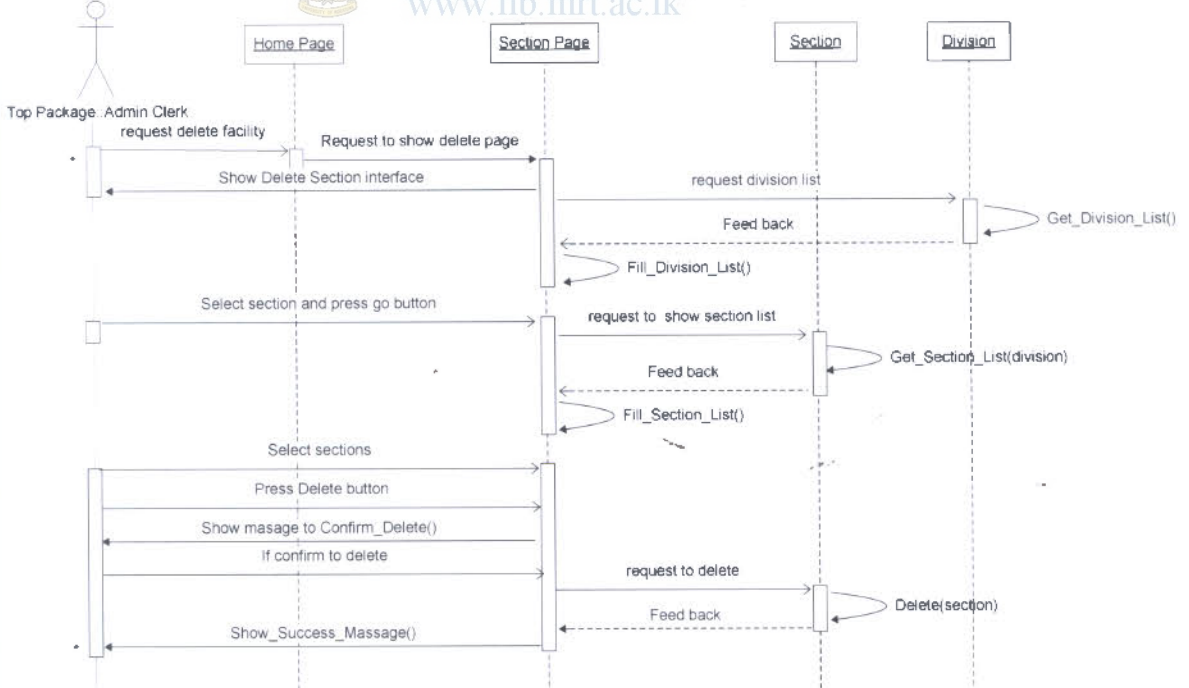


Figure D.26- Sequence Diagram – Manage Section Information (Delete)

Manage Assigning of Employee to a Division/Section (Add)

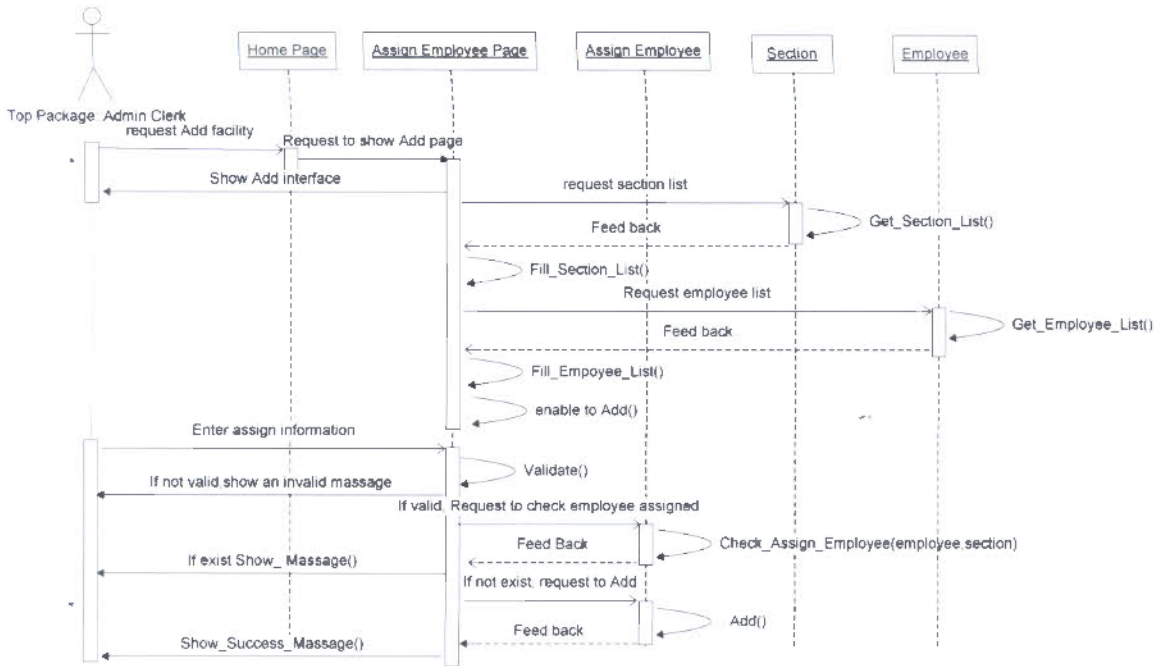


Figure D.28- Sequence Diagram – Manage Assigning of Employee to Division/Section (Add)

Manage Assigning of Employee to a Division/Section (Edit)

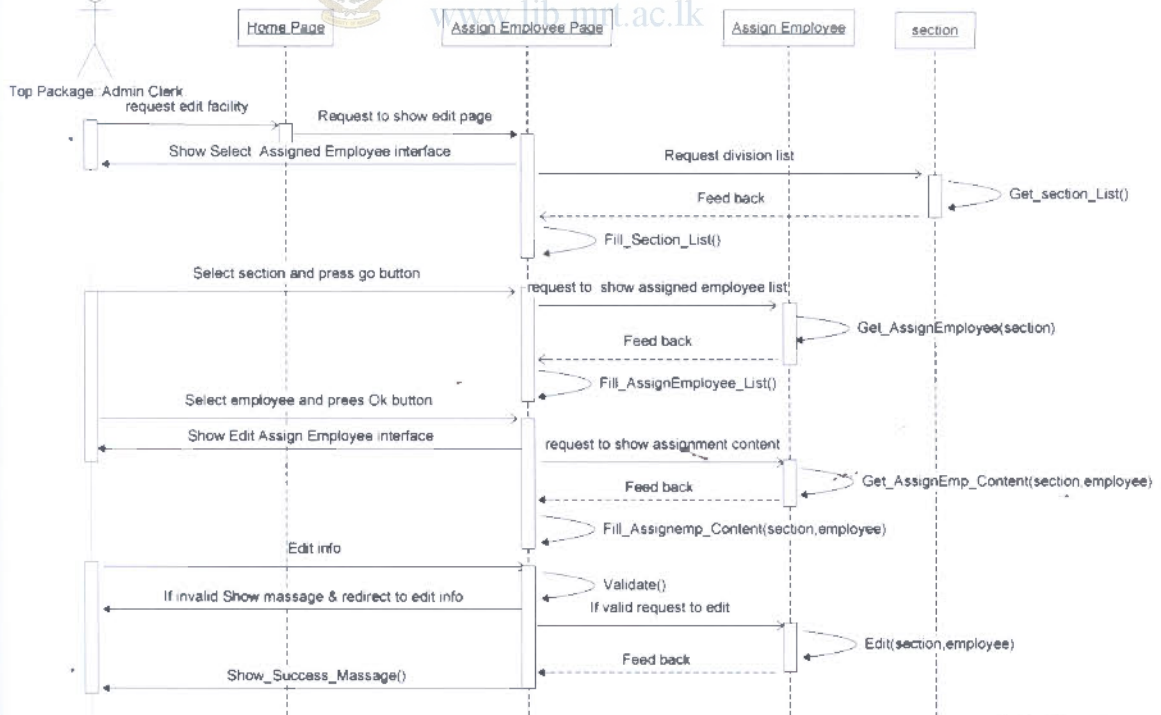


Figure D.29 - Sequence Diagram – Manage Assigning of Employee to Division/Section (Edit)

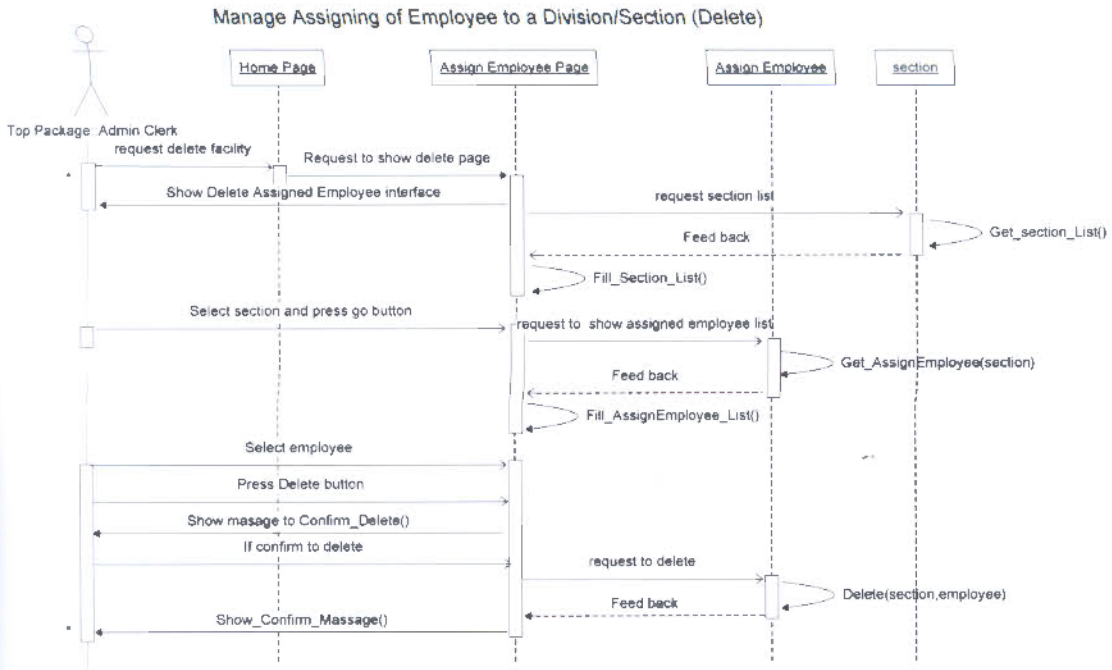


Figure D.30- Sequence Diagram – Manage Assigning of Employee to Division/Section (Delete)

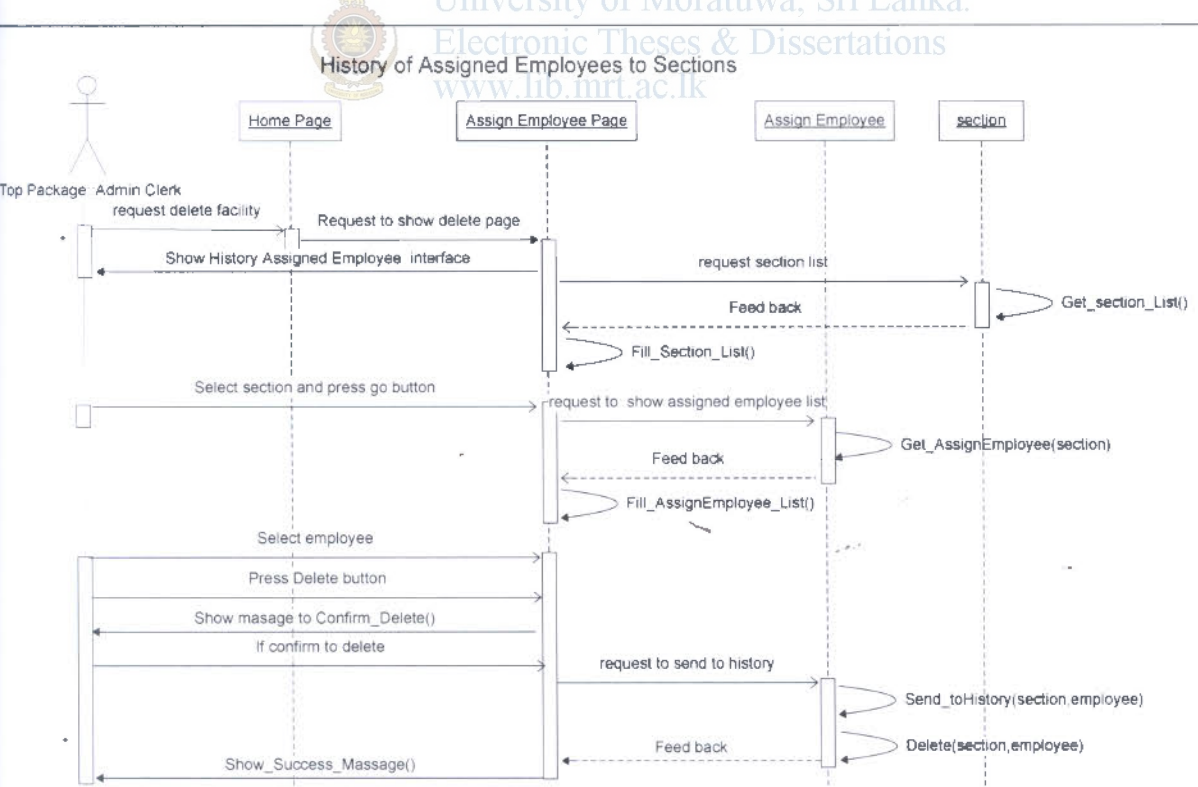


Figure D.31- Sequence Diagram – History of Assigned Employees to sections

Manage Designation Information (Add)

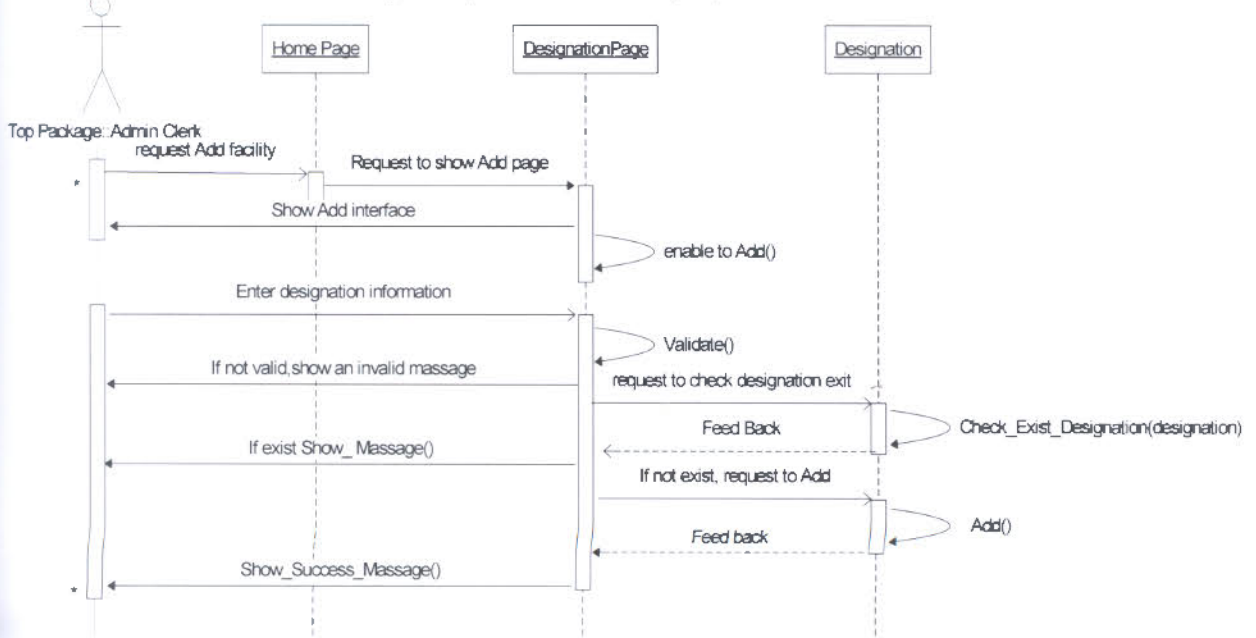


Figure D.32- Sequence Diagram – Manage Designation Information (Add)

Manage Designation Information (Edit)

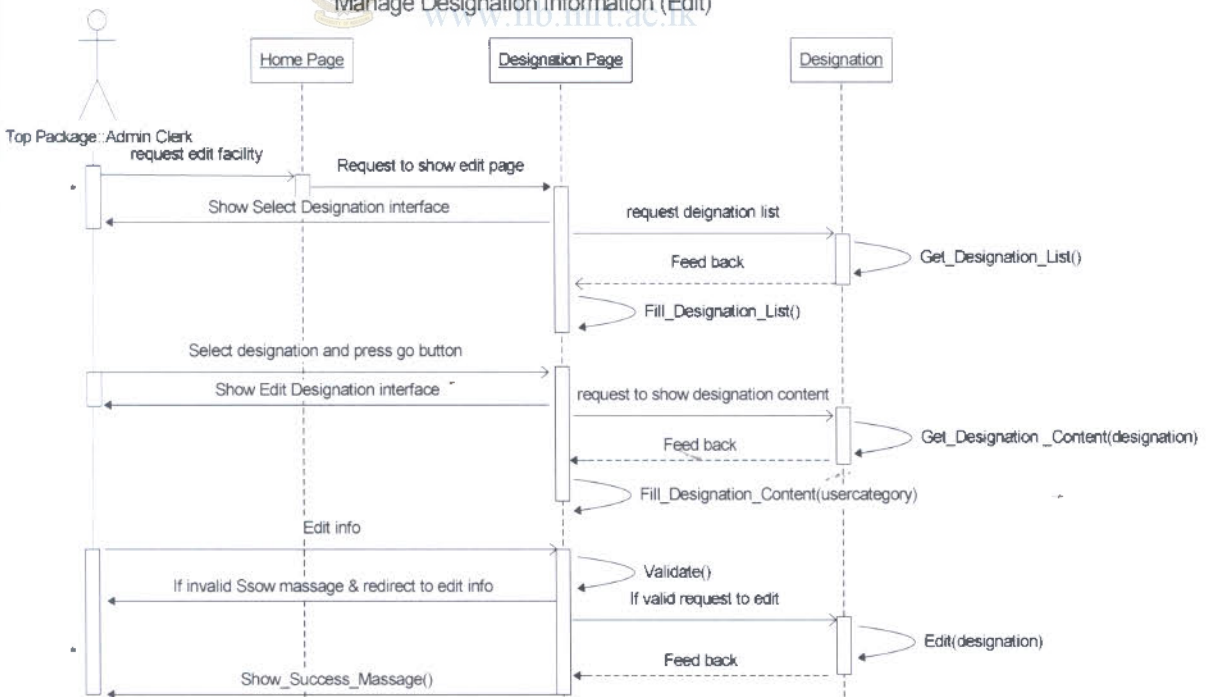


Figure D.33- Sequence Diagram – Manage Designation Information (Edit)



Manage Designation Information (Delete)

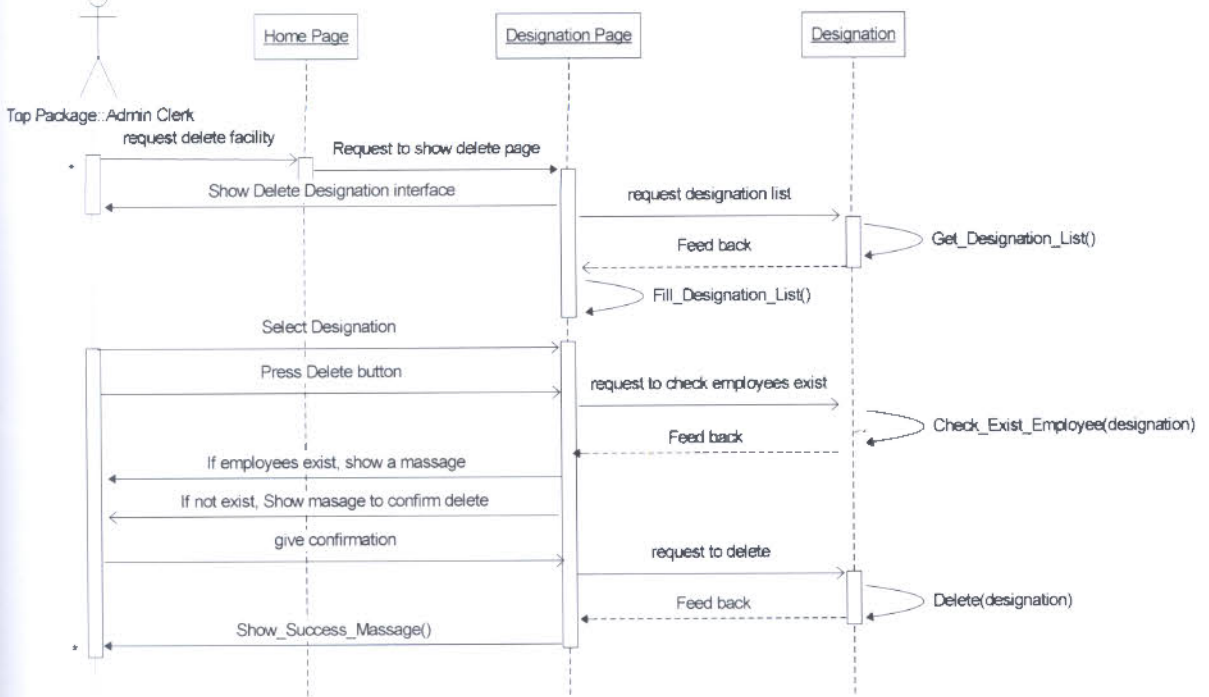


Figure D.34- Sequence Diagram – Manage Designation Information (Delete)

Manage Grade Information (Add)

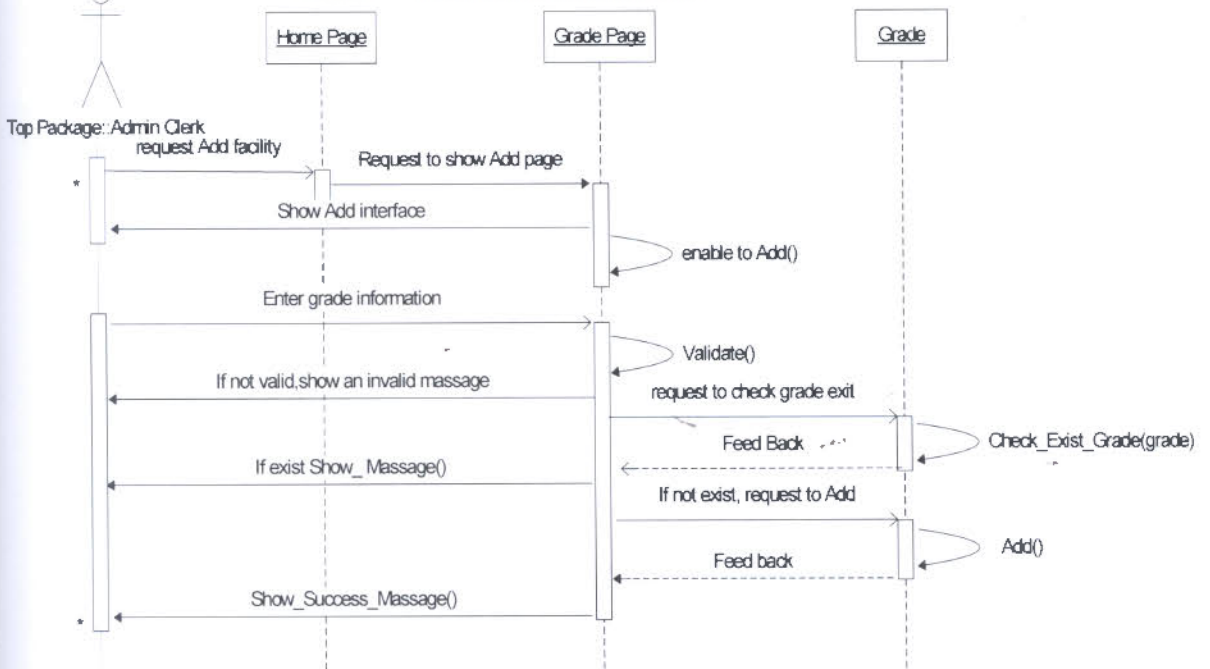


Figure D.35- Sequence Diagram – Manage Grade Information (Add)

Manage Grade Information (Edit)

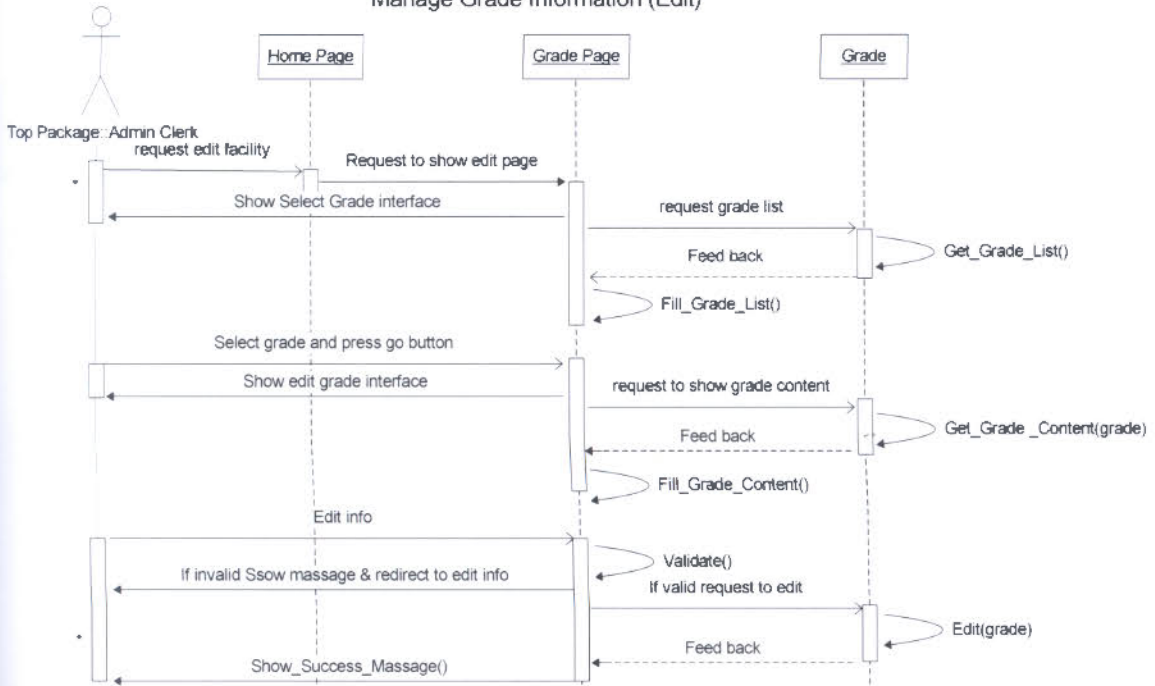


Figure D.36- Sequence Diagram – Manage Grade Information (Edit)

Manage Grade Information (Delete)

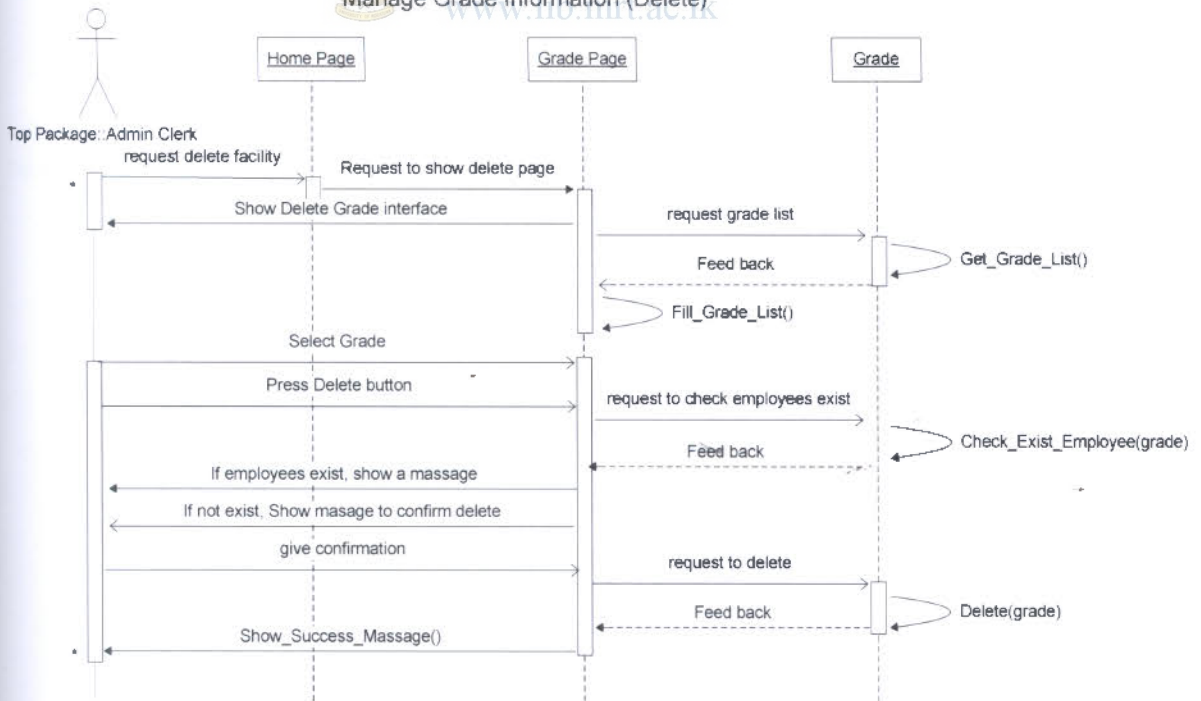


Figure D.37- Sequence Diagram – Manage Grade Information (Delete)

Employee Recruitment - View / Print Reports

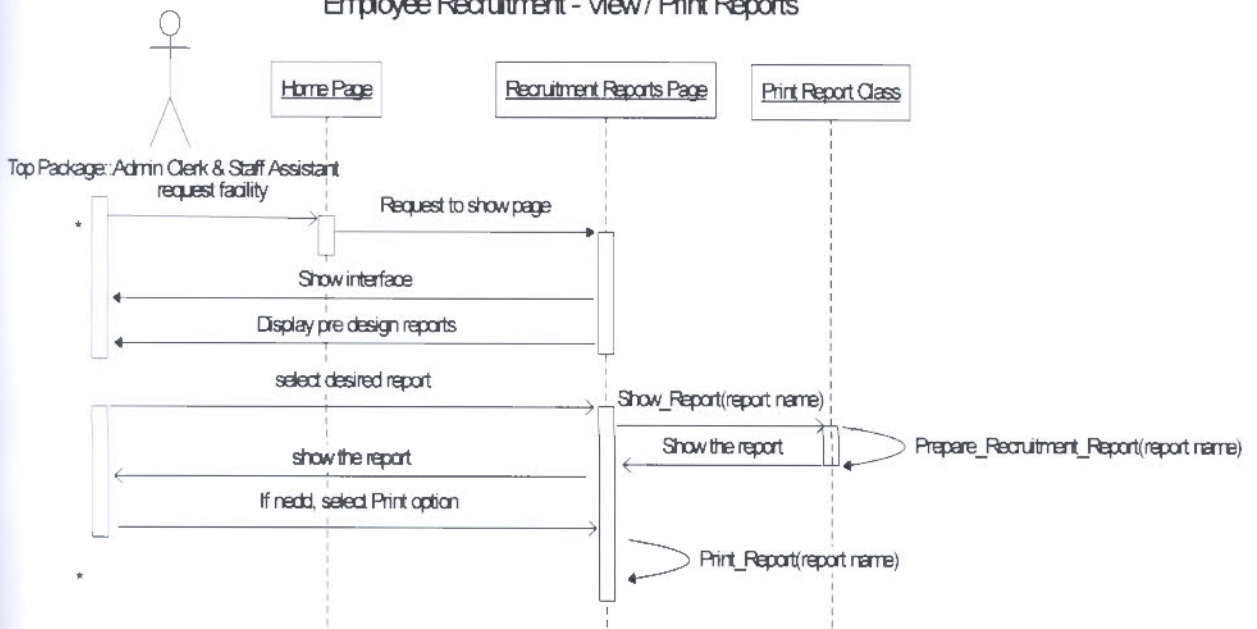


Figure D.38- Sequence Diagram – View / Print Reports of Employee Recruitment

Manage EPF/ETF Information

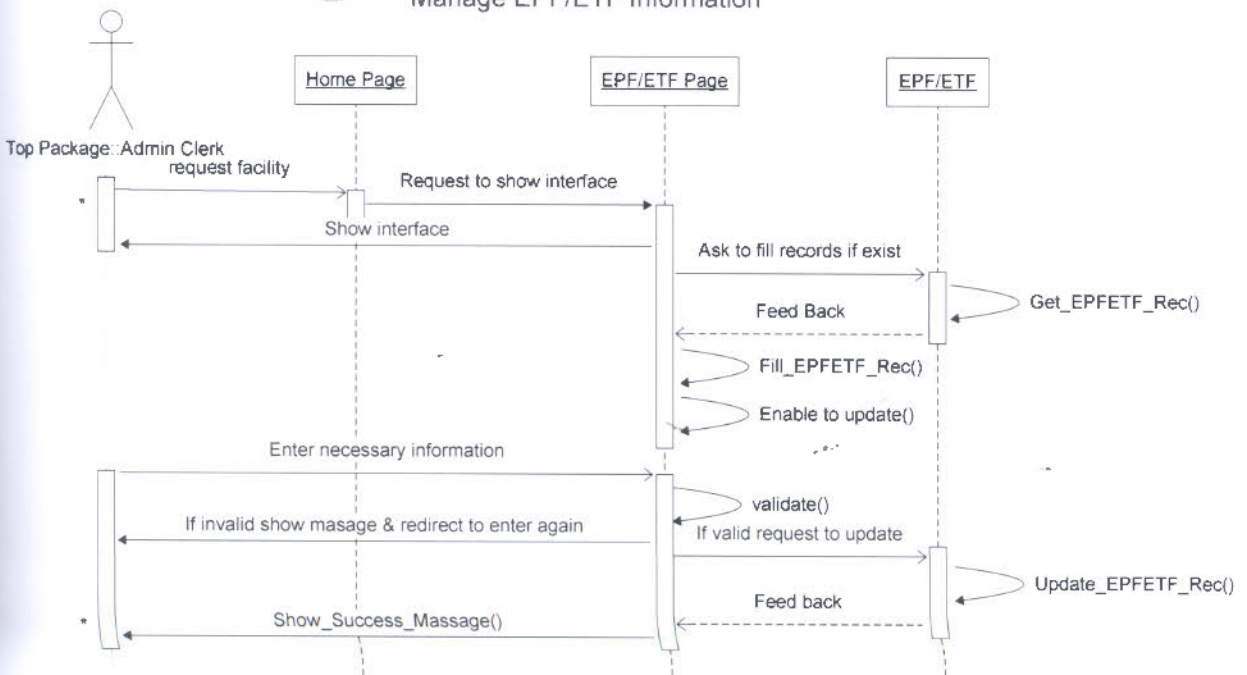


Figure D.39- Sequence Diagram – Manage ETF/EPF Records

ETF/EPF Handling - View / Print Reports

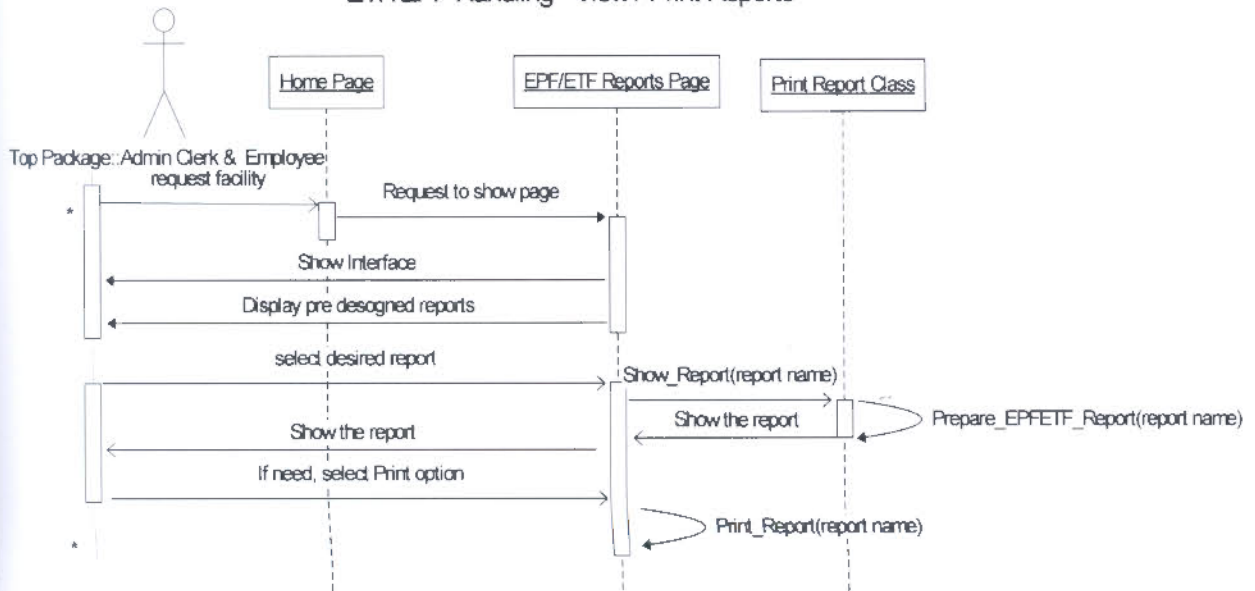


Figure D.40- Sequence Diagram – View/Print EPF/ETF Handling

Manage User Category Information (Add)

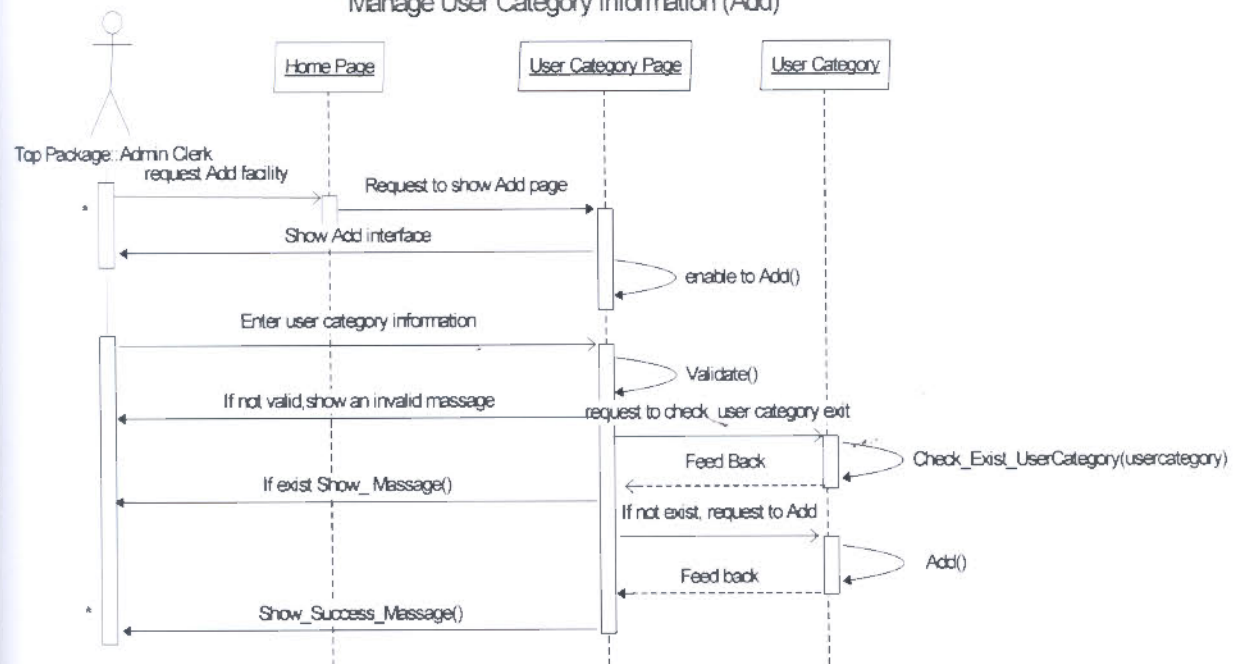


Figure D.41- Sequence Diagram – Manage User Category Information (Add)

Manage User Category Information (Edit)

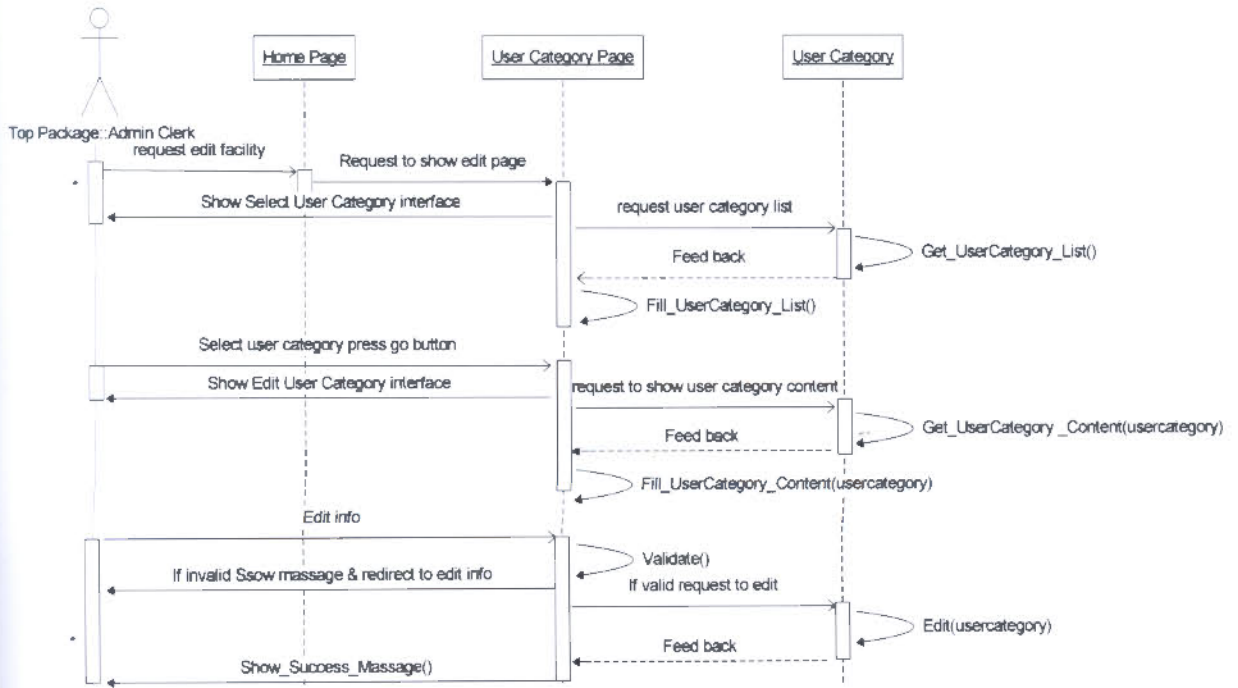


Figure D.42- Sequence Diagram – Manage User Category Information (Edit)

Manage User Category Information (Delete)

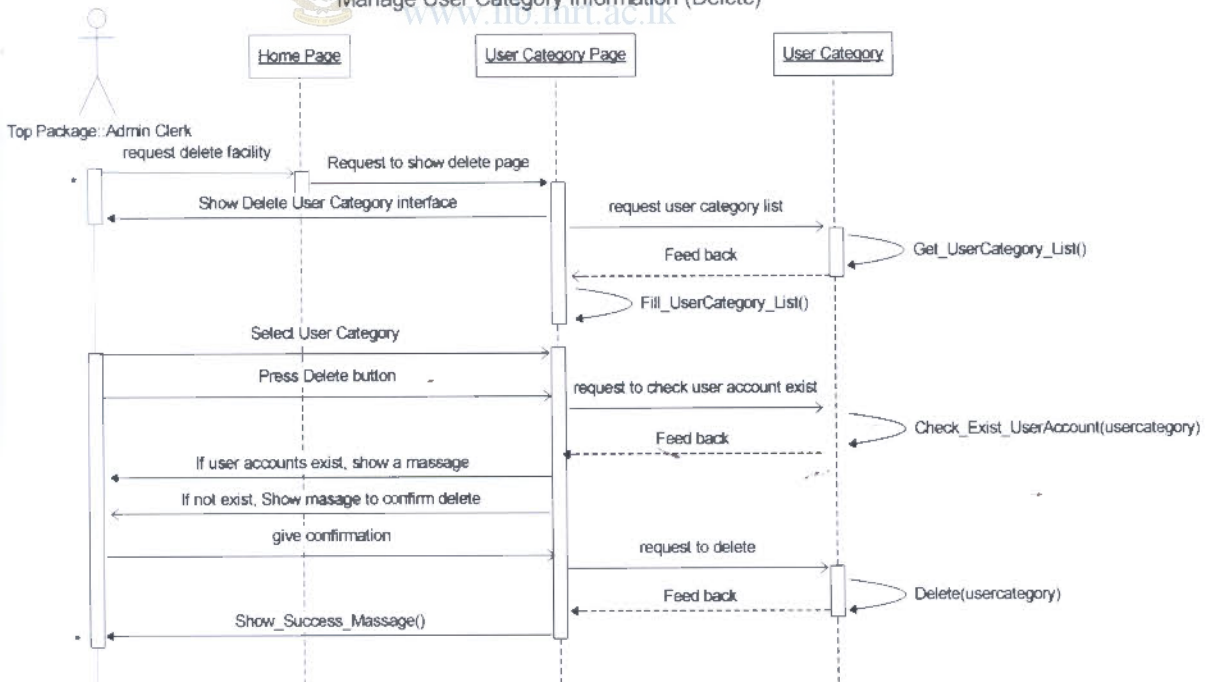


Figure D.43- Sequence Diagram – Manage User Category Information (Delete)

Manage System Facility Information (Add)

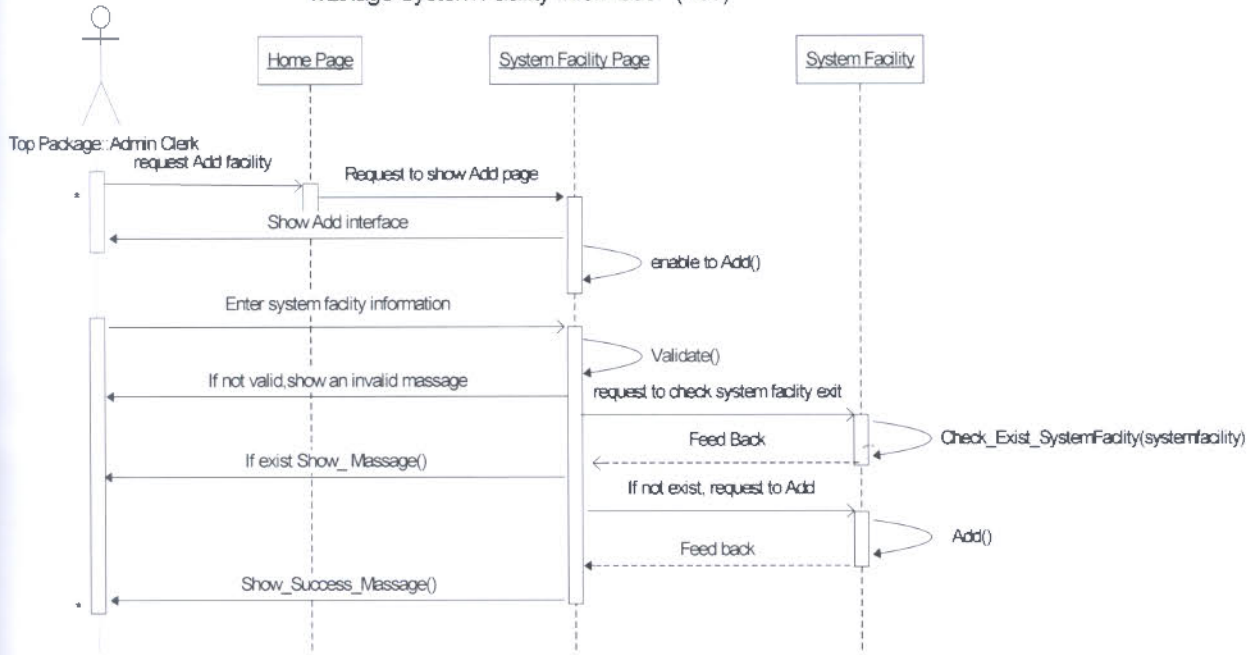


Figure D.44- Sequence Diagram – Manage System Facility Information (Add)

Manage System Facility Information (Edit)

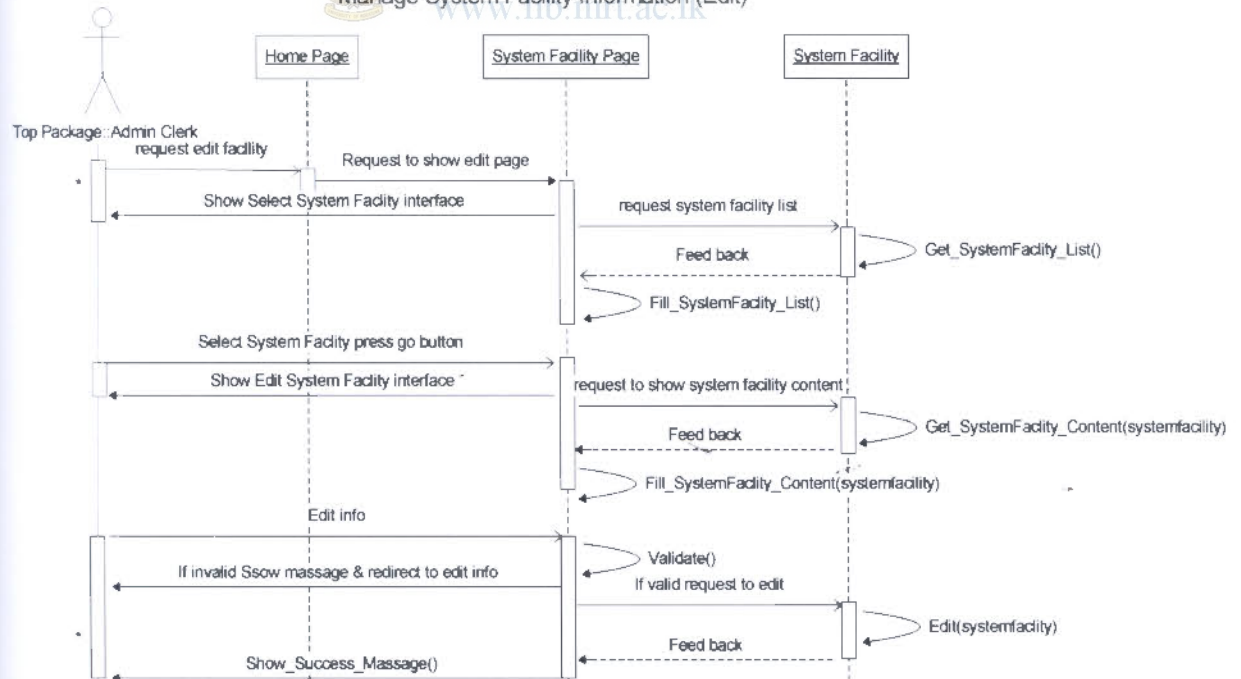


Figure D.45- Sequence Diagram – Manage System Facility Information (Edit)

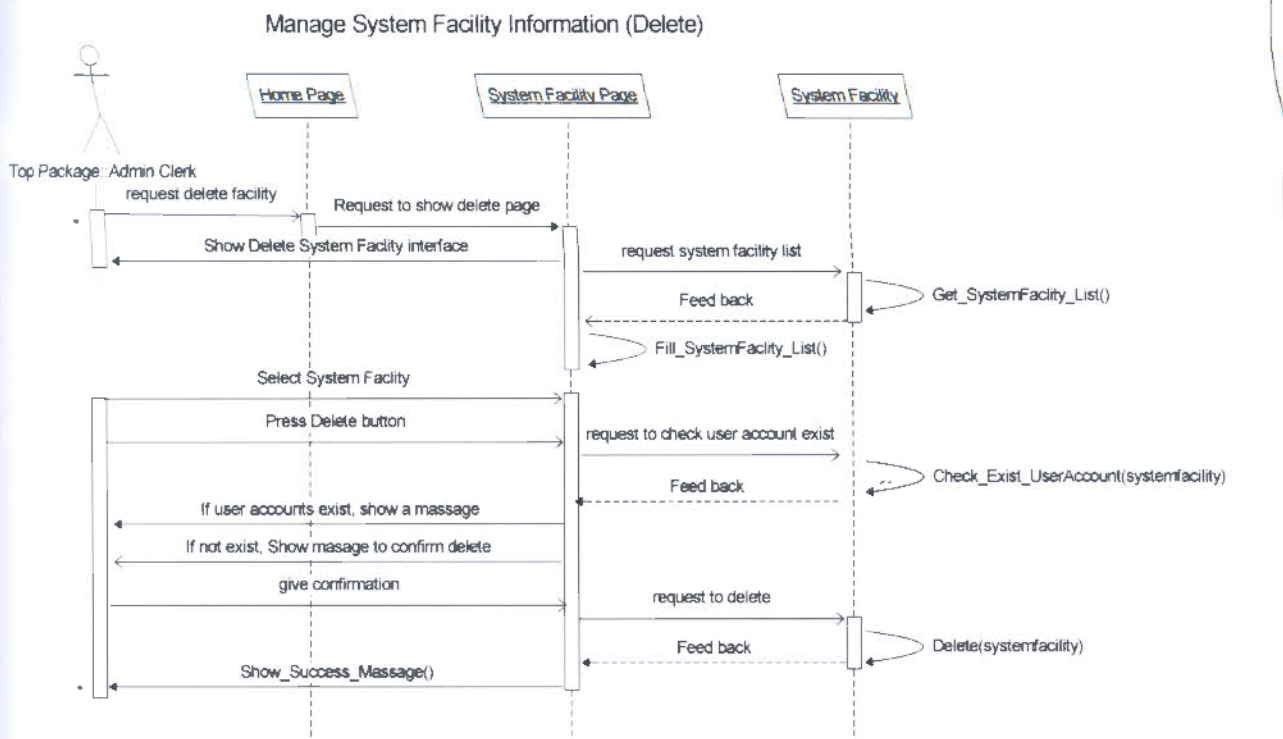


Figure D.46- Sequence Diagram – Manage System Facility Information (Delete)

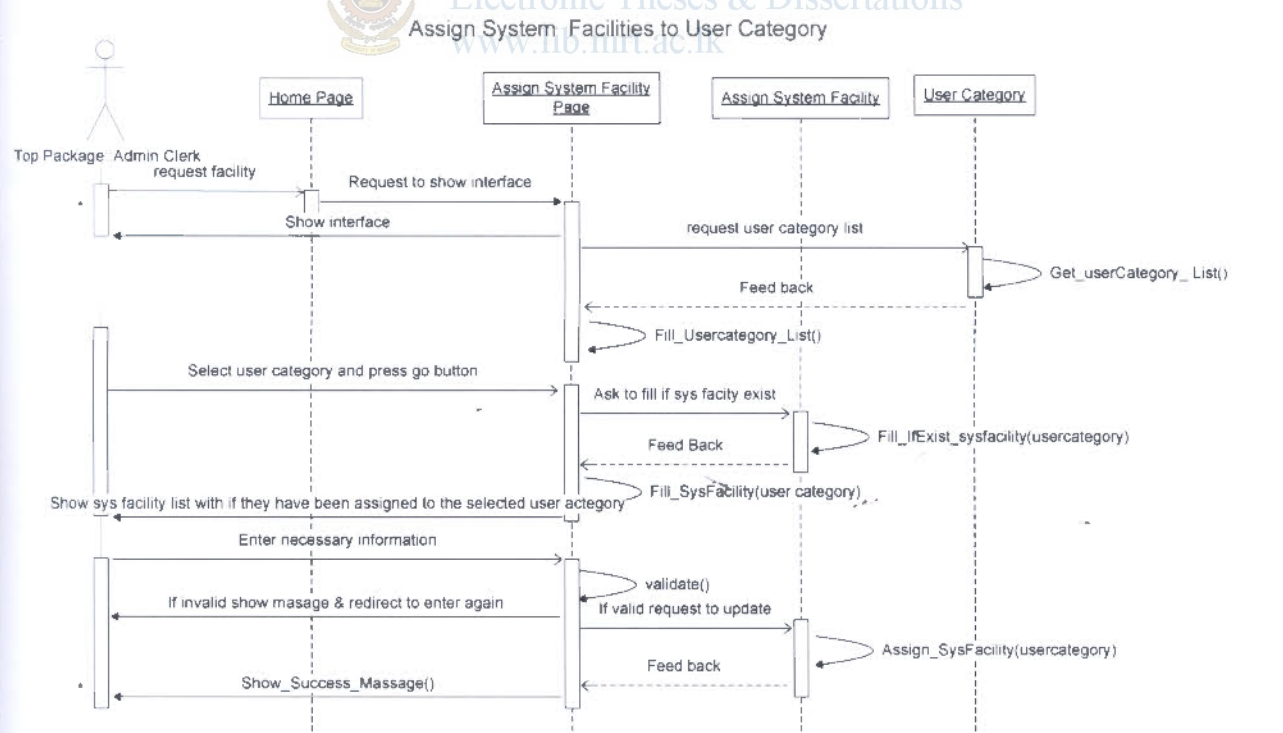


Figure D.47- Sequence Diagram – Assign System Facilities to User Category

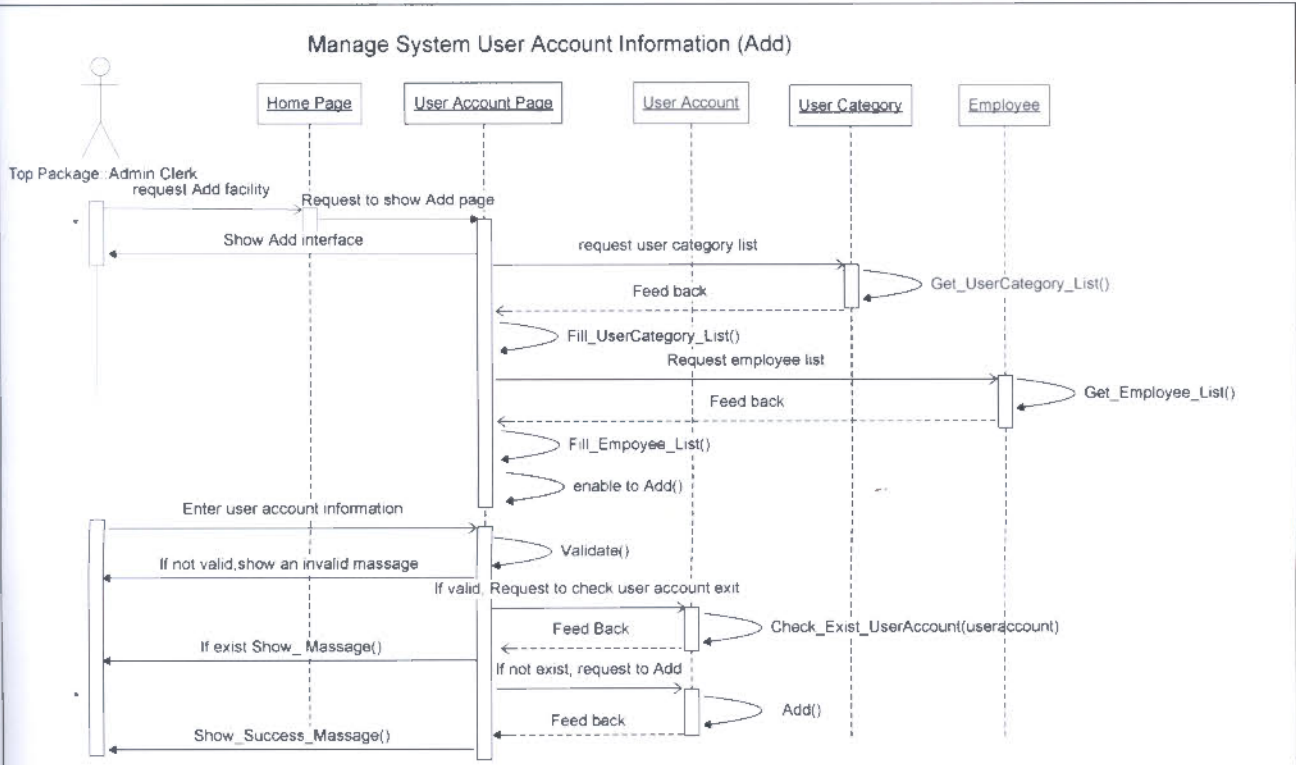


Figure D.48- Sequence Diagram – Manage System User Account Information (Add)

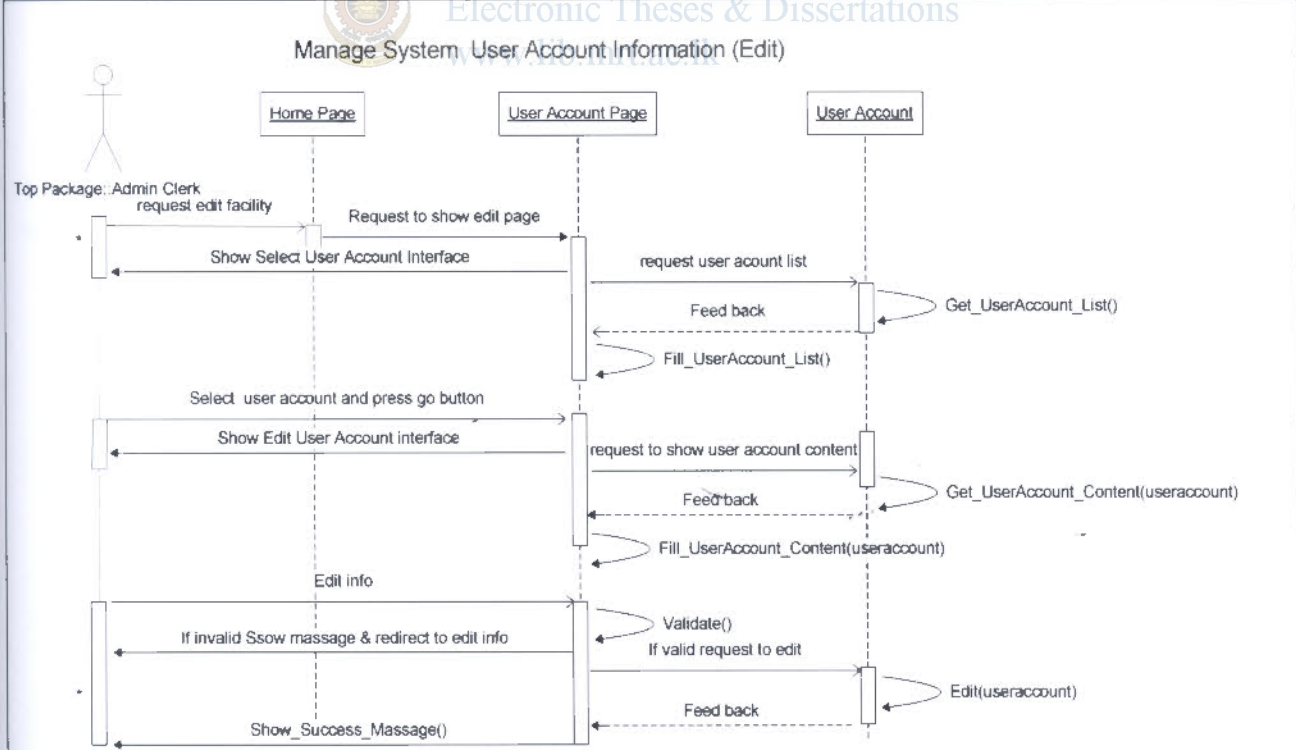


Figure D.49- Sequence Diagram – Manage System User Account Information (Edit)

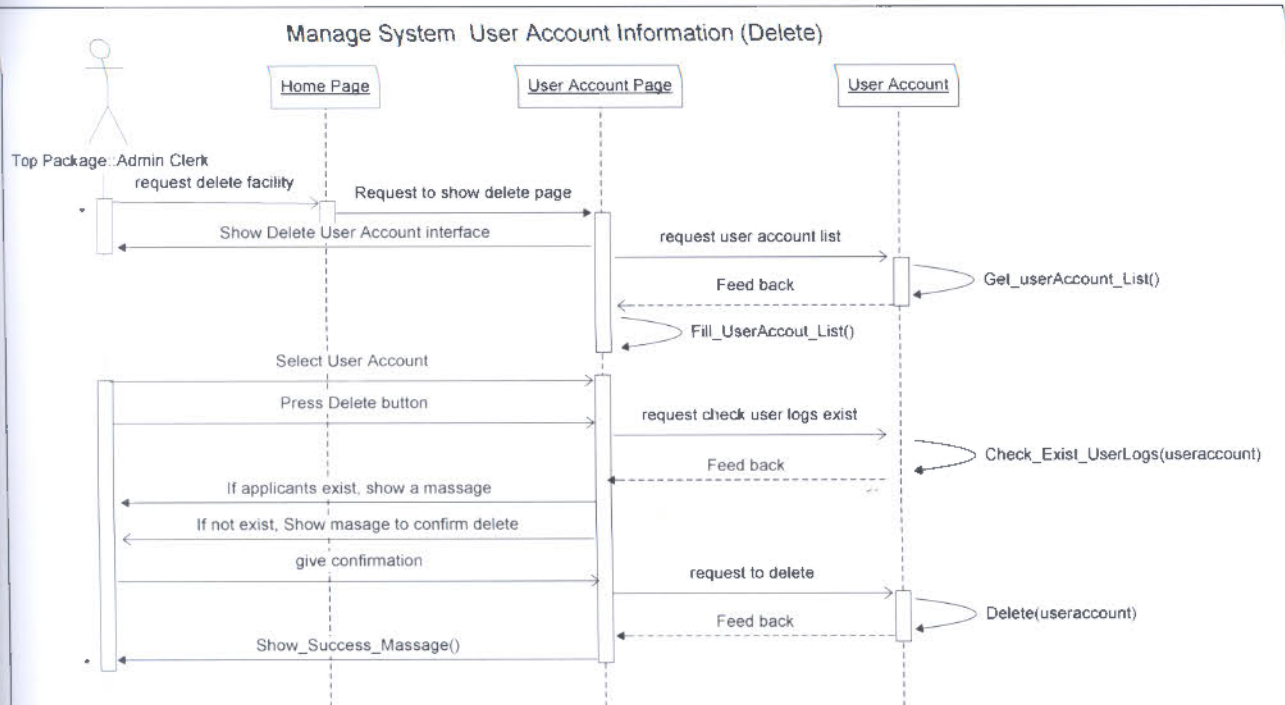


Figure D.50- Sequence Diagram – Manage System User Account Information (Delete)

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System Administration - View / Print Reports

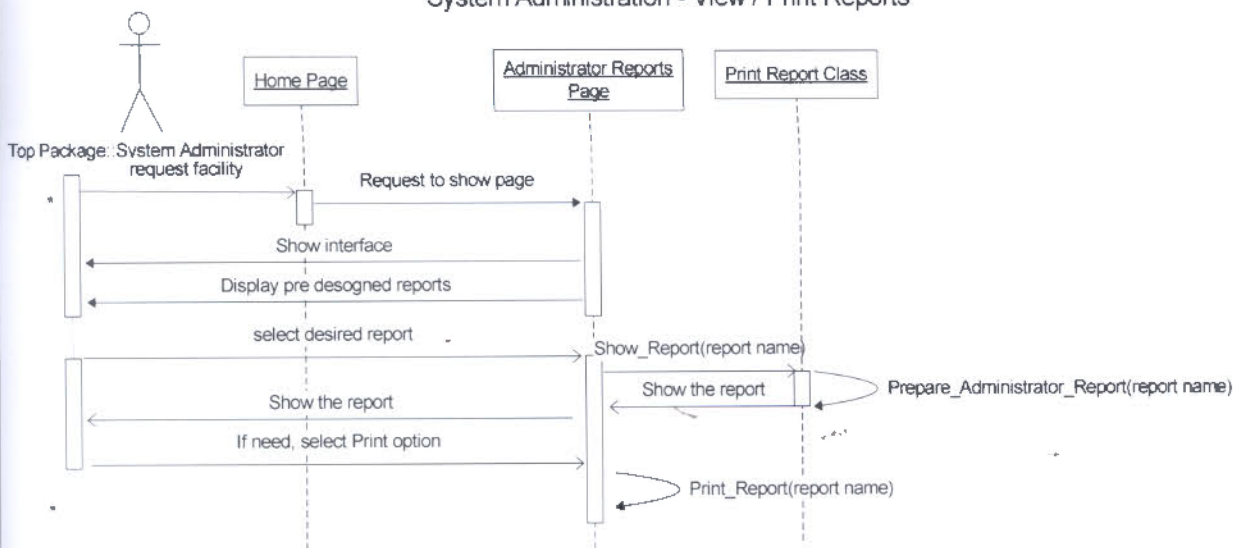
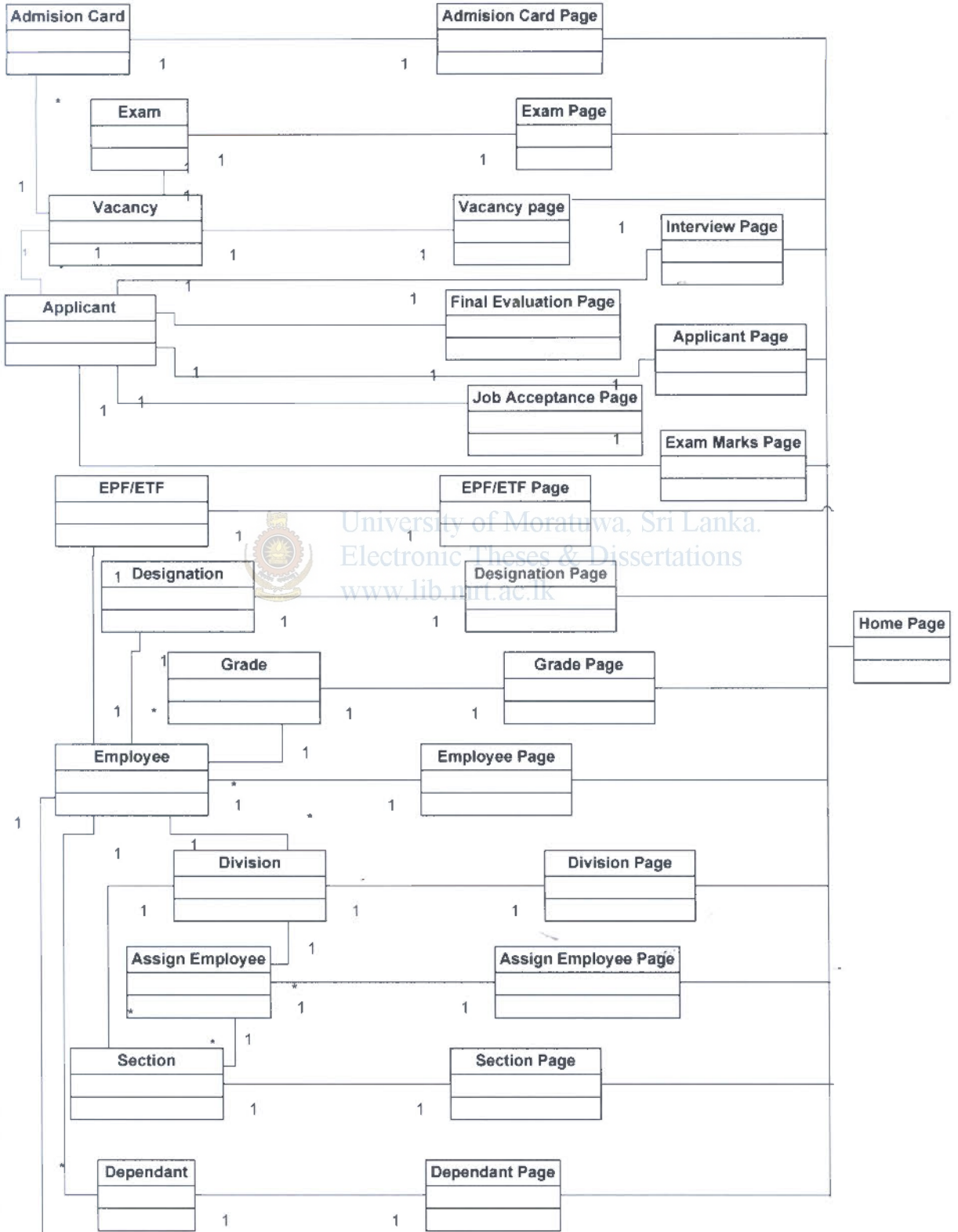
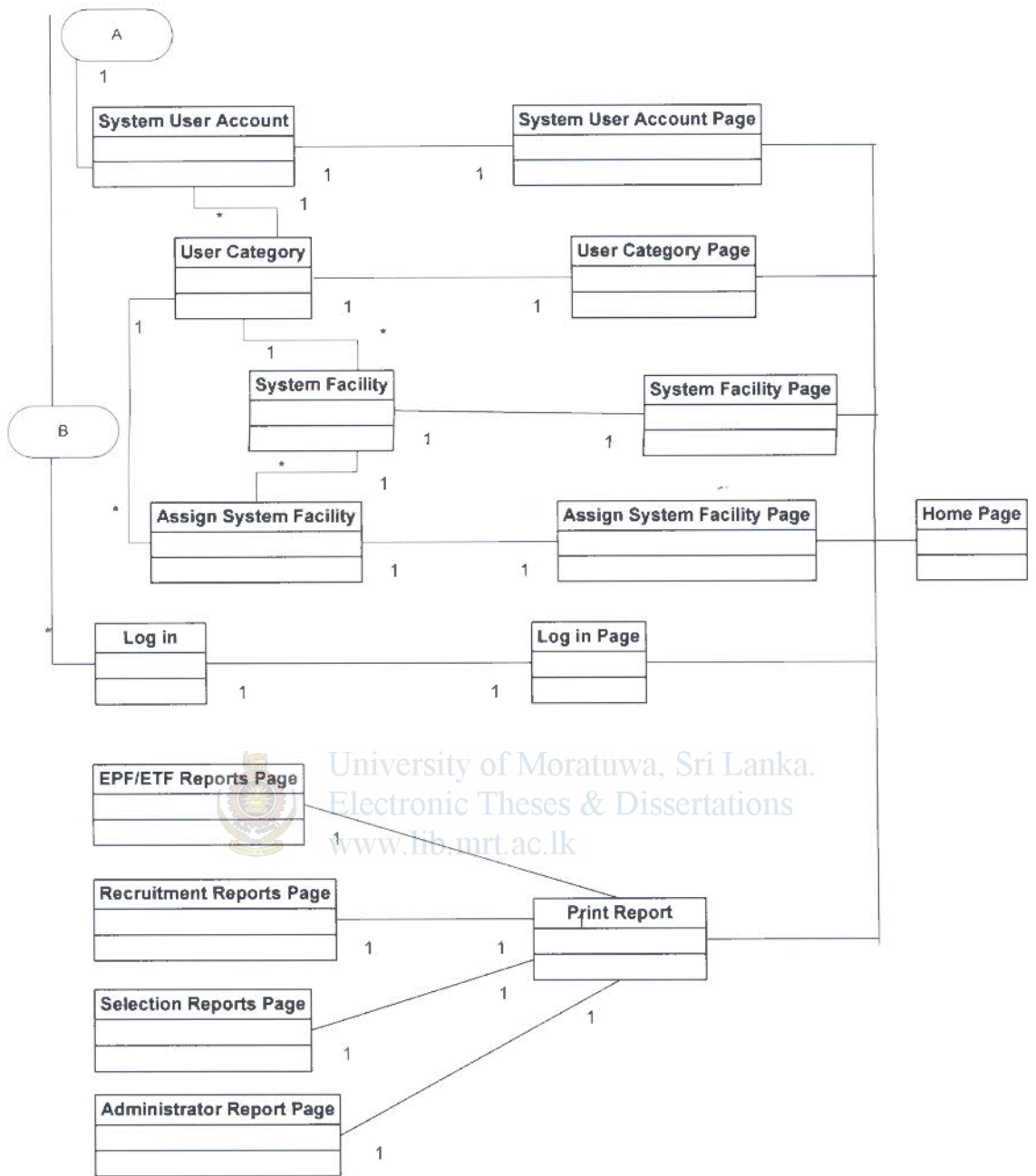


Figure D.51- Sequence Diagram – View / Print Reports of System Administration



Class diagram





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Figure E – Class Diagram

Given bellow is a list of the methods of each entity, interface and controlled classes of the proposed system

Applicant
+Add() +Edit() +Delete() +Get_Applicants_List() +Get_Applicant_Content() +Update_Exam_Marks() +Update_Interview_Marks() +Update_Final_Evaluation_Marks() +Update_Appointment_Rec() +Check_Exist_Exam_Marks() +Check_Exist_Interview_Marks() +Check_Exist_Appointment_Rec() +Check_Exist_Final_Evaluation_Marks() +Check_Exist_Applicant()

Applicant Page
+Show Add Applicant Page +Show Select Applicant Page +Show Select Delete Applicant Page

Exam Marks Page
+Show Exam Marks Page()

Interview Marks Page
+Show Interview Marks Page() Final Evaluation Page +Show Final Evaluation Page()

Job Acceptance Page
+Show Job Acceptance Page()

Vacancy
+Add() +Edit() +Delete() +Get_Vacancy_List +Get_Vacancy_Content() +Check_Exist_Vacancy()

Vacancy Page
+Show Add Vacancy Page() +Show Edit Vacancy Page() +Show Delete Vacancy Page()

Exam
+Update_Exam_Information() +Get_Exam_Content()

Exam Page
+Show Exam Page()

Admission Card
+Update_IndexNo() +Get_IndexNo()

Admission Card Page
+Show Admission Card Page()

Employee
+Add() +Edit()

Employee Page
+Show Add Employee Page() +Show Select Employee Page()



+Delete()
+Get_Employees_List
+Get_Employee_Content()
+Check_Exist_Employee()

Division
+Add() +Edit() +Delete() +Get_Division_List +Get_Division_Content() +Check_Exist_Division() +Check_Exist_Employee()

Division Page
+Show Add Division Page() +Show Select Division Page() +Show Delete Division Page()

Section
+Add() +Edit() +Delete() +Get_Section_List +Get_Section_Content() +Check_Exist_Section()

Section Page
+Show Add Section Page() +Show Select Section Page() +Show Delete Section Page()

Dependent
+Add() +Edit() +Delete() +Get_Dependent_List +Get_Dependent_Content() +Check_Exist_Dependent()



Dependent Page
+Show Add Dependent Page() +Show Select Dependent Page() +Show Delete Dependent Page()

Assign Employee
+Add() +Edit() +Delete() +Get_AssignEmp_List +Get_AssignEmp_Content()

Assign Employee Page
+Show Add Assign Employees Page() +Show Select Assign Employees Page() +Show Delete Assign Employees Page() +Show History of Assigned Employees Page()

EPF/ETF
+Get_EPFETF_Rec() +Update_EPFETF_Rec()

EPFETF Page
+Show EPFETF Page()

Designation
+Add() +Edit() +Delete() +Get_Designation_List +Get_Designation_Content() +Check_Exist_Designation() +Check_Exist_Employee()

Designation Page
+Show Add Designation Page() +Show Select Designation Page() +Show Delete Designation Page()

Grade
+Add() +Edit() +Delete() +Get_Grade_List +Get_Grade_Content() +Check_Exist_Grade() +Check_Exist_Employee()

Grade Page
+Show Add Grade Page() +Show Select Grade Page() +Show Delete Grade Page()

System User Account
+Add() +Edit() +Delete() +Get_UserAccount_List +Get_UserAccount_Content() +Check_Exist_UserAccount() +Check_Exist_Employee() +Is_Correct_Uname_Pass()

System User Account Page
+Show Add User Account Page() +Show Select User Account Page() +Show Delete User Account Page()

User Category
+Add() +Edit() +Delete() +Get_UserCategory_List +Get_UserCategory_Content() +Check_Exist_UserCategory() +Check_Exist_UserAccount()

User Category Page
+Show Add User Category Page() +Show Select User Category Page() +Show Delete User Category Page()

System Facility
+Add() +Edit() +Delete() +Get_SystemFacility_List +Get_SystemFacility_Content() +Check_Exist_SystemFacility() +Check_Exist_UserAccount()

System Facility Page
+Show Add System Facility Page() +Show Select System Facility Page() +Show Delete System Facility Page()

Assign System Facility
+Fill_Exist_SysFacility() +Assign_SysFacility()

Assign System Facility Page
+Show Assign System Facility Page()

Log in
+Add_Login()

Log in Page
+Show Log in Page()

Print Report
+Print_Selection_Reports() +Print_Recruitment_Reports() +Print_EPFETF_Reports() +Print_Administrator_Reports()

Selection Reports Page
+Show Reports() Recruitment Reports Page +Show Reports()

EPFETF Reports Page
+Show Reports()

Administrator Reports Page
+Show Reports()

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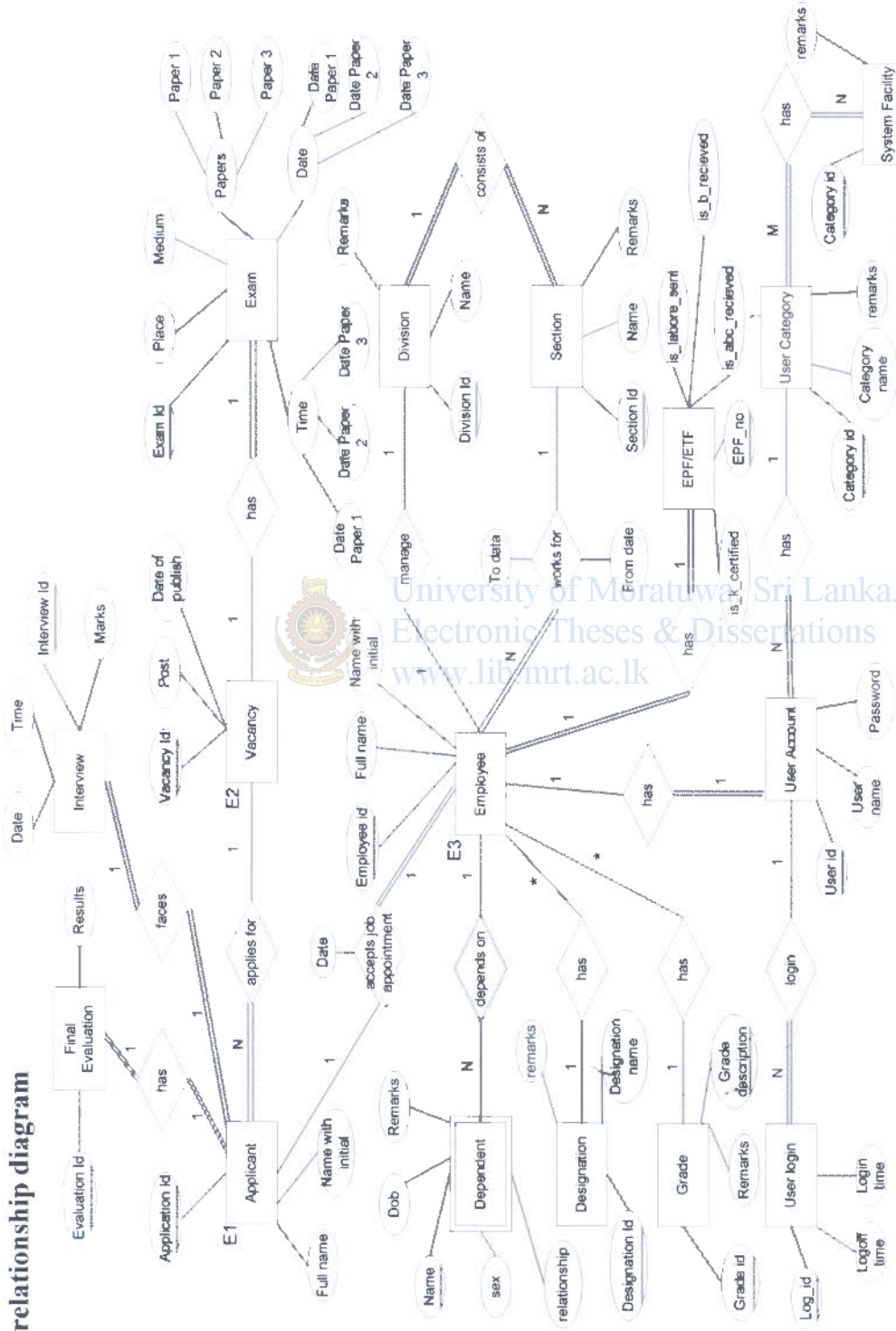
Appendix F

Entity relationship diagram, relational database schema and relational table design.



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F.1 - Entity relationship diagram

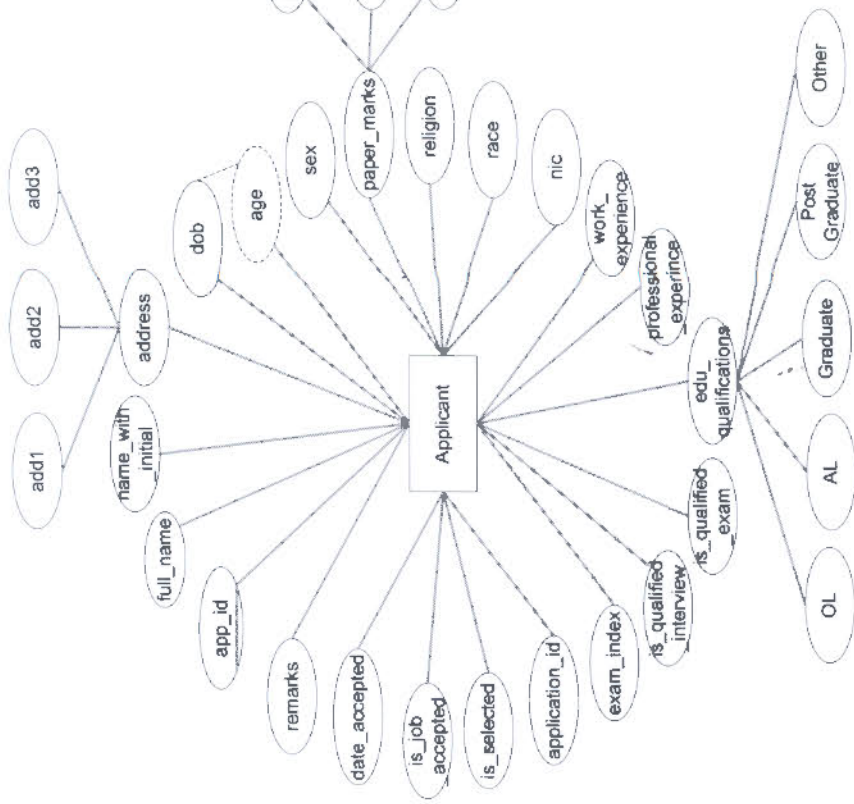


Note: Please consider that attributes of Applicant (E1), Vacancy (E2), and Employee (E3) entities are listed in separate. Refer to

Figure F.1- Entity Relationship Diagram



Attributes of Applicant Entity (E1)



Attributes of Vacancy Entity (E2)

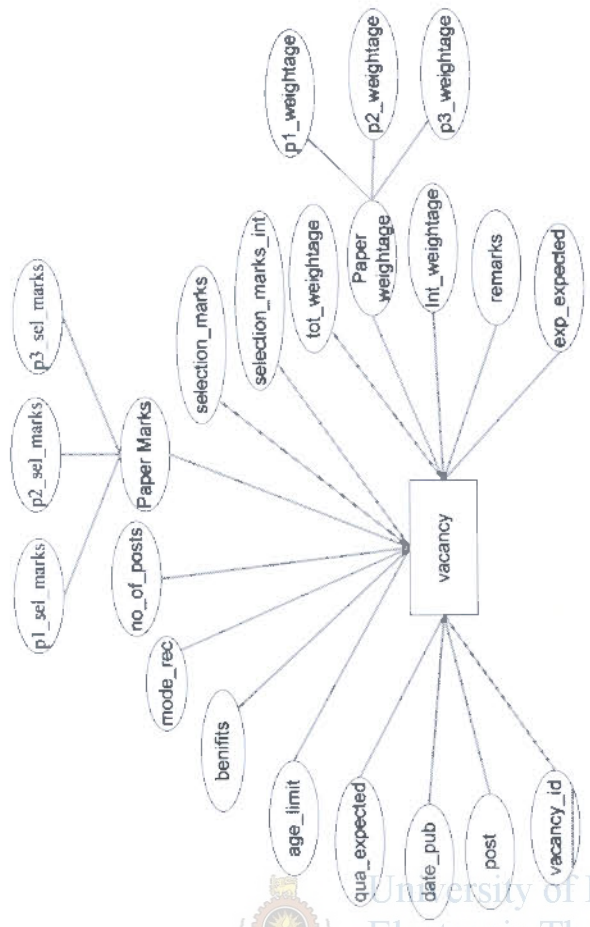


Figure F.2- Attributes of Applicants & Vacancy Entities

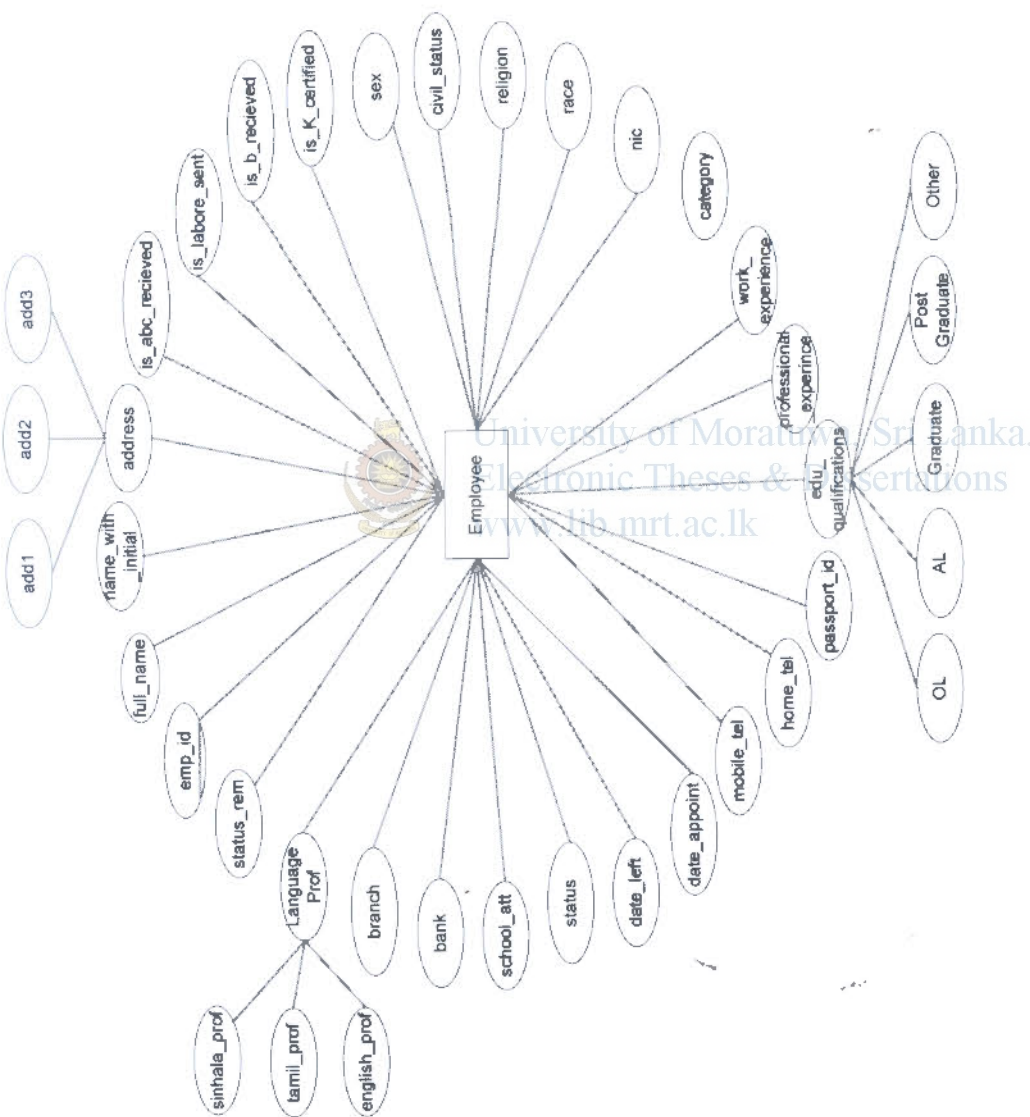


Figure F.3- Attributes of Employee Entity



F.2 - Relational database schema

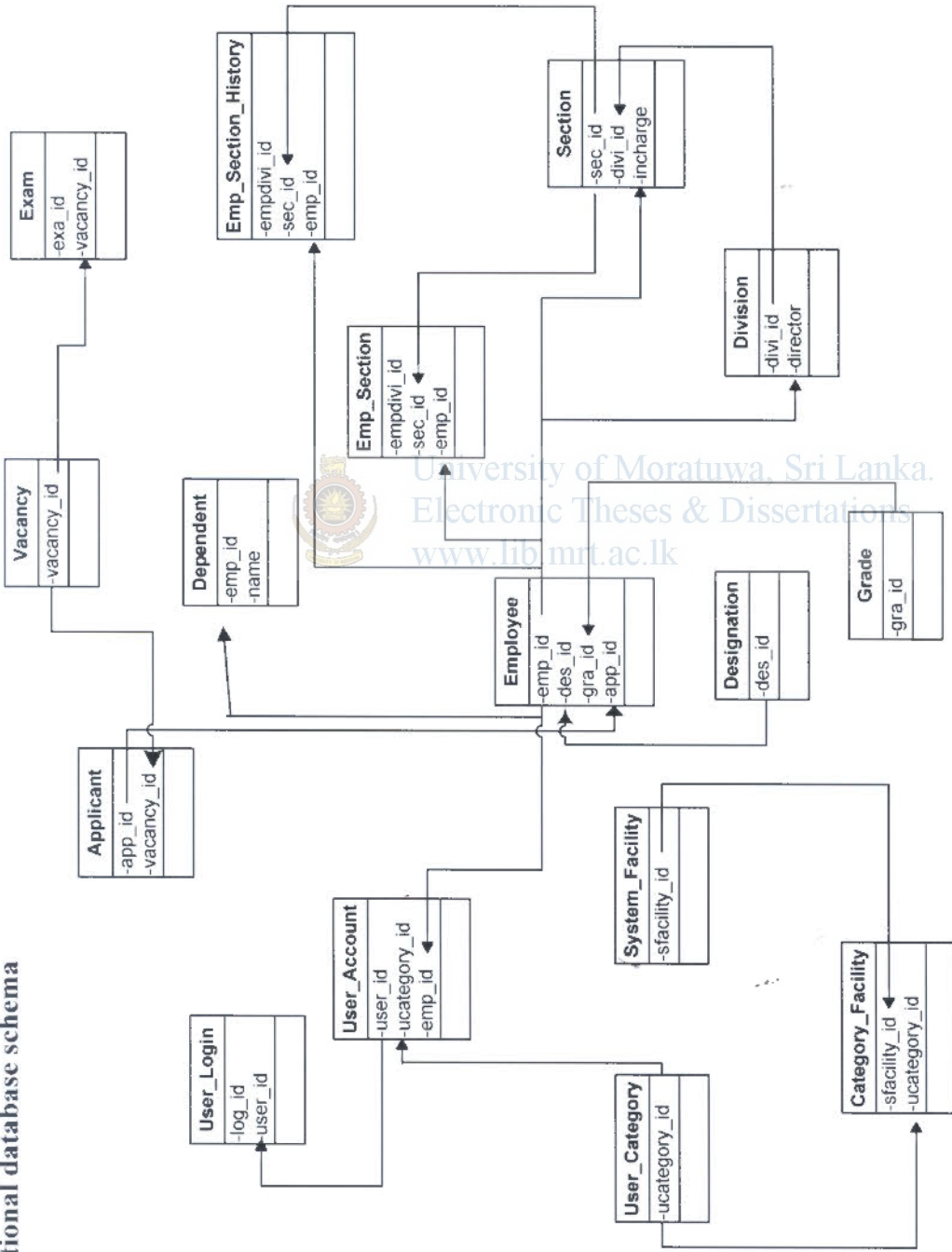


Figure F.4- Relational Database Mapping

F.3 - Database table structure

Applicant Table

Attribute	Data Type	Remarks
app_id	integer	Primary key, Application Id
full_name	varchar(100)	Full name
name_initial	varchar(45)	Name with initial
add 1	varchar(50)	Address
add 2	varchar(50)	Address
add 3	varchar(50)	Address
age	integer	Age
dob	date	Date of Birth
sex	varchar(10)	Sex
religion	varchar(20)	Religion
race	varchar(20)	Race
nic	varchar(45)	National Identity Card No
edu_ol	varchar(150)	Ordinary Level Qualifications
edu_al	varchar(150)	Advanced Level Qualifications
edu_graduate	varchar(150)	Degrees
edu_postgraduate	varchar(150)	Post Graduate degrees
edu_other	varchar(200)	Other educational qualifications
work_exp	varchar(200)	Working experience
prof_qua	varchar(200)	Professional experience
is_qualified_exam	tinyint(1)	Whether applicant is qualified for exam
exam_index	varchar(45)	Examination Index
p1_marks	float	Marks obtained for paper 1
p2_marks	float	Marks obtained for paper 2
p3_marks	float	Marks obtained for paper 3
is_qualified_int	tinyint(1)	Whether applicant is qualified for interview
int_date	date	Interview date
int_time	varchar(20)	Interview time
int_marks	float	Interview marks obtained
application_id	integer	Application id given
is_selected	tinyint(1)	Whether applicant is qualified as a recruit
eva_rec	varchar(100)	Evaluation records
is_job_accepted	tinyint(1)	Whether applicant accepted job appointment
date_accepted	date	Date of job acceptance
remarks	varchar(100)	Further information
vacancy_id	Integer	Which vacancy that the applicant belongs to

Table Description – Applicant Table

Primary Key	app_id
Foreign key	vacancy_id
Table Type	InnoDB

Remarks	Cascade edit yes / cascade delete no
---------	--------------------------------------

Vacancy Table

Attribute	Data Type	Remarks
vacancy_id	integer	Primary key, Vacancy id
post	varchar(100)	Post applied
date_pub	date	Date of published
qua_expected	varchar(250)	Qualifications expected
exp_expected	varchar(250)	Experiences expected
age_limit	varchar(45)	Age limited
benefit	varchar(100)	Benefits
mode_rec	varchar(45)	Mode of recruitment
p1_sel_marks	float	Paper 1 pass mark
p2_sel_marks	float	Paper 2 pass mark
p3_sel_marks	float	Paper 3 pass mark
p1_weightage	decimal(10,2)	Weightage assigned for paper 1
p2_weightage	decimal(10,2)	Weightage assigned for paper 2
p3_weightage	decimal(10,2)	Weightage assigned for paper 3
selection_marks	float	Pass mark for total papers
int_weightage	decimal(10,2)	Weightage assigned for interview marks
no_of_posts	smallint	No of vacancies available for the post
selection_marks_int	float	Pass mark for interview
tot_weightage	decimal(10,2)	Weightage assigned for total marks obtained
remarks	varchar(100)	Remarks for additional information

Table Description – Vacancy Table

Primary Key	vacancy_id
Foreign key	none
Table Type	InnoDB
Remarks	Cascade edit yes / cascade delete yes

Exam Table

Attribute	Data Types	Remarks
exa_id	integer	Primary key, Exam id
place	varchar(75)	Where the exam is held
medium	varchar(45)	English / sinhala / tamil
paper1	varchar(45)	Name of the paper 1
paper2	varchar(45)	Name of the paper 2
paper3	varchar(45)	Name of the paper 3
date_p1	varchar(20)	Date of paper 1 is held
date_p2	varchar(20)	Date of paper 2 is held
date_p3	varchar(20)	Date of paper 3 is held
time_p1	varchar(20)	Time of paper 1 is held

time_p2	varchar(20)	Time of paper 2 is held
time_p3	varchar(20)	Time of paper 3 is held
vacancy_id	integer	Vacancy to which the exam is belonged to

Table Description – Exam Table

Primary Key	Exa_id
Foreign key	vacancy_id
Table Type	InnoDB
Remarks	

Employee Table

Attribute	Data Type	Remarks
emp_id	integer	Primary key,Employee
epf_no	integer	EPF no
pfile_no	integer	Personnel file no
full_name	varchar(100)	Full name
name_initial	varchar(45)	Name with initial
add 1	varchar(50)	Address
add 2	varchar(50)	Address
add 3	varchar(50)	Address
dob	datetime	Date of Birth
sex	varchar(10)	Sex
religion	varchar(20)	Religion
race	varchar(20)	Race
nic	varchar(45)	National Identity Card No
passport_id	varchar(45)	Passport id
home_tel	varchar(45)	Home telephone
mobile_tel	varchar(45)	Mobile telephone
email	varchar(45)	email
civil_status	varchar(15)	Civil status
edu_ol	varchar(150)	Ordinary Level Qualifications
edu_al	varchar(150)	Advanced Level Qualifications
edu_graduate	varchar(150)	Degrees
edu_postgraduate	varchar(150)	Post Graduate degrees
edu_other	varchar(200)	Other educational qualifications
work_exp	varchar(200)	Working experience
prof_qua	varchar(200)	Professional experience
school_att	varchar(150)	Schools attended
bank	varchar(50)	Name of the bank
branch	varchar(100)	Branch
sinhala_prof	varchar(45)	Sinhala language proficiency
tamil_prof	varchar(45)	Tamil language proficiency
english_prof	varchar(45)	English language proficiency

date_appoint	date	Date of appointment
date_left	date	Date of left
job_status	varchar(20)	Job status : Retied/Terminated/Suspended
staus_rem	varchar(100)	Remarks for job status
category	varchar(45)	Employee category: Executive / non-executive
is_abc_recievd	tinyint(1)	Whether EPF forms A,B,C received to division
is_labore_sent	tinyint(1)	Whether filled EPF forms sent to labore dept
is_b_recievd	tinyint(1)	Whether EFP form B received from labore dept
is_k_certified	tinyint(1)	Whether ETF form K certified by SLSI
des_id	integer	Current designation id
des_rem	varchar(100)	Remarks for designation information
gra_id	integer	Grade id
gra_rem	varchar(150)	Remarks for grade information
app_id	integer	Application id

Table Description – Employee Table

Primary Key	emp_id
Foreign key	des_id (Designation table) gra_id (Grade table) app_id (Applicant table)
Table Type	InnoDB
Remarks	Cascade edit yes / cascade delete no

Dependent Table

Attribute	Data Type	Remarks
emp_id	integer	Employee id, primary key is emp_id+name
name	varchar(150)	Name of the dependent
sex	varchar(10)	Male / female
relationship	varchar(45)	Relationship the employee
dob	date	Date of birth
rem	varchar(100)	Remarks for further information

Table Description – Dependent Table

Primary Key	emp_id + name
Foreign key	Emp_id (Employee table)
Table Type	InnoDB
Remarks	

Designation Table

Attribute	Data Type	Remarks
des_id	integer	Primary key, Designation id
des_name	varchar(50)	Description of the designation
remarks	varchar(150)	Remarks for further information

Table Description – Designation Table

Primary Key	des_id
Foreign key	non
Table Type	InnoDB
Remarks	

Grade Table

Attribute	Data Type	Remarks
gra_id	integer	Primary key, Grade id
dra_des	varchar(50)	Description of the Grade
remarks	varchar(150)	Remarks for further information

Table Description – Grade Table

Primary Key	gra_id
Foreign key	non
Table Type	InnoDB
Remarks	

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Division Table

Attribute	Data Type	Remarks
divi_id	intger	Primary key, Division id
divi_name	varchar(75)	Name of the division
director	integer	Director for the division
remarks	varchar(100)	Remarks for further information

Table Description – Division Table

Primary Key	divi_id
Foreign key	non
Table Type	InnoDB
Remarks	Cascade edit yes / cascade delete yes

Section Table

Attribute	Data Type	Remarks
sec_id	integer	Primary key,section id
sec_name	varchar(100)	Name of the section
incharge	integer	in charge for the division
divi_id	integer	To Which division the section is belonged to
remarks	varchar(100)	Remarks for further information

Table Description – Section Table

Primary Key	sec_id
Foreign key	divi_id (Division table) incharge (Employee)
Table Type	InnoDB
Remarks	Cascade edit yes / cascade delete no

Emp_Section Table

Attribute	Data Type	Remarks
empdivi_id	integer	Primary key
emp_id	integer	Employee id
sec_id	integer	Section id
from_date	date	The date of assigned
to_date	date	The date that employee is reassigned to another division/section
remarks	varchar(100)	Remarks for further information

Table Description – Emp_Section Table

Primary Key	Empdivi_id
Foreign key	sec_id (section table) emp_id (Employee table)
Table Type	InnoDB
Remarks	

Emp_Section_History Table

Attribute	Data Type	Remarks
empdivi_id	integer	Primary key
emp_id	integer	Employee id
sec_id	integer	Section id
from_date	date	The date of assigned
to_date	date	The date that employee is reassigned to another division/section

remarks	varchar(100)	Remarks for further information
---------	--------------	---------------------------------

Table Description – Emp_Section_History Table

Primary Key	Empdivi_id
Foreign key	sec_id (section table) emp_id (Employee table)
Table Type	InnoDB
Remarks	

User_Login Table

Attribute	Data Type	Remarks
log_id	integer	Primary key
user_id	integer	Logged user id
login_time	datetime	Time of logging
logoff_time	datetime	Time of logoff

Table Description – User_Login Table

Primary Key	log_id
Foreign key	user_id (User Account table)
Table Type	InnoDB
Remarks	



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User_Account Table

Attribute	Data Type	Remarks
user_id	integer	Primary key, User account id
emp_id	integer	Employee no of the user
user_name	varchar(50)	Name of the user
passwd	varchar(25)	Password
ucategory_id	integer	User category that the user belongs to

Table Description – User_Account Table

Primary Key	user_id
Foreign key	Ucategory_id (User Category table) Emp_id (Employee)
Table Type	InnoDB
Remarks	Cascade edit yes / cascade delete yes

User_Category Table

Attribute	Data Type	Remarks
ucategory_id	integer	Primary key, user category id
cat_name	varchar(50)	Category description
remarks	varchar(75)	Remarks for further information

Table Description – User_Category Table

Primary Key	ucategory_id
Foreign key	none
Table Type	InnoDB
Remarks	Cascade edit yes / cascade delete yes

Category_Facility Table

Attribute	Data Type	Remarks
catsys_id	integer	Primary key
sfacility_id	integer	System facility id
ucategory_id	integer	User category id
remarks	varchar(100)	Remarks for further information

Table Description – Category_Facility Table

Primary Key	Sfacility_id + ucategory_id
Foreign key	Sfacility_id (System_Facility table) ucategory_id (User Category table)
Table Type	InnoDB
Remarks	

System_Facility Table

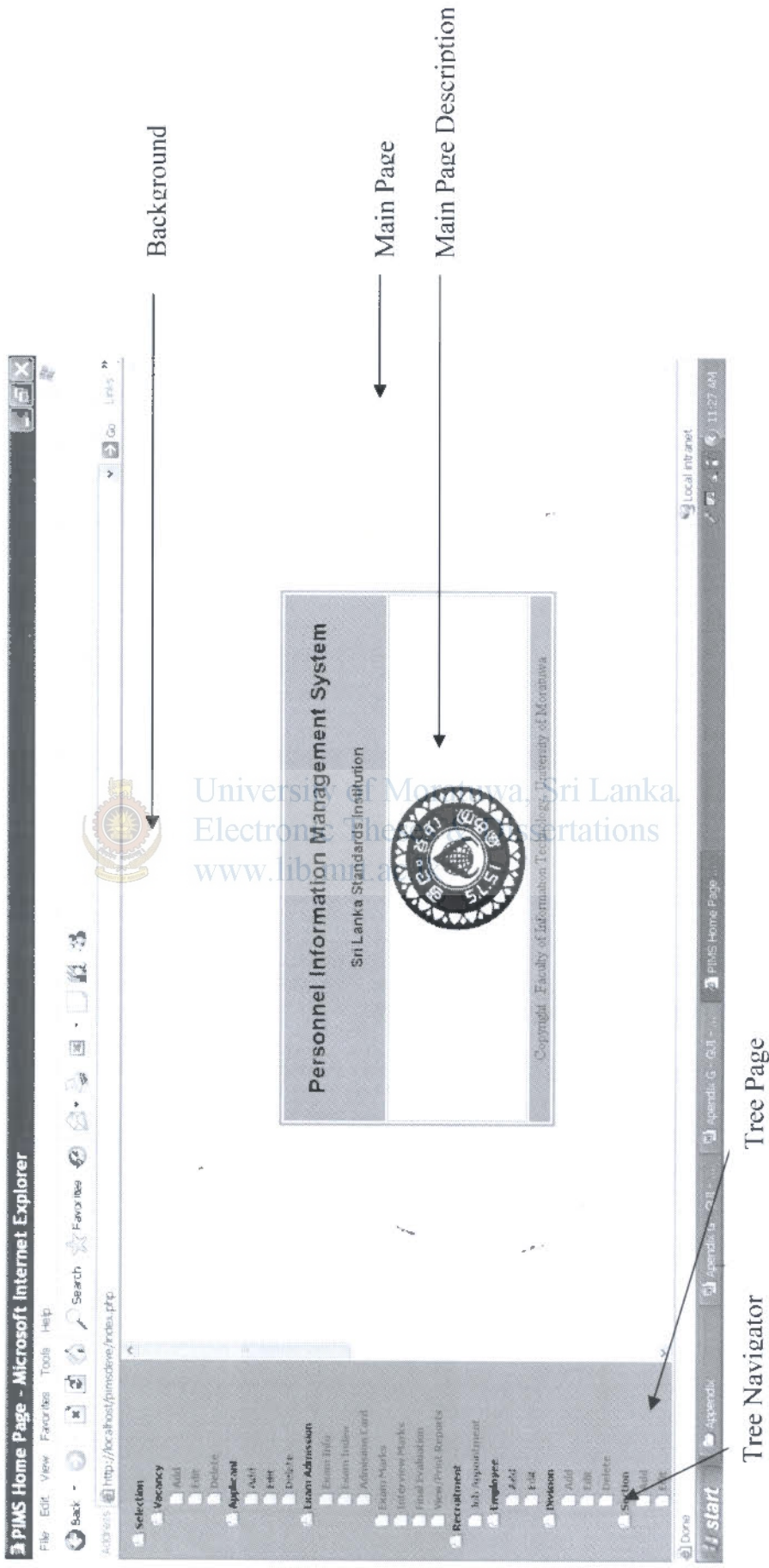
Attribute	Data Type	Remarks
sfacility_id	integer	Primary key, System facility id
facility_name	varchar(75)	Name of the facility
remarks	varchar(75)	Remarks for further information

Table Description –System_Facility Table

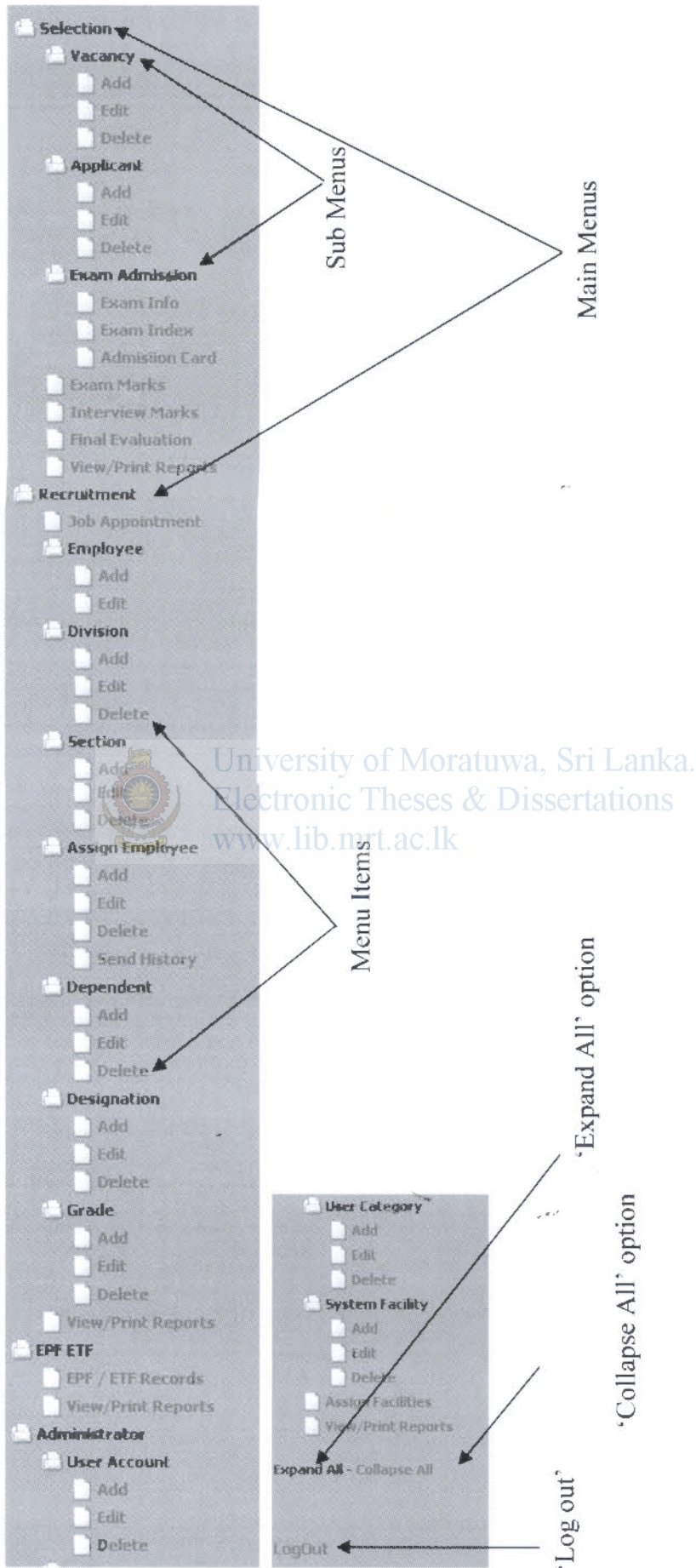
Primary Key	Sfacility_id
Foreign key	none
Table Type	InnoDB
Remarks	Cascade edit yes / cascade delete yes

Description of graphical user interface (GUI)

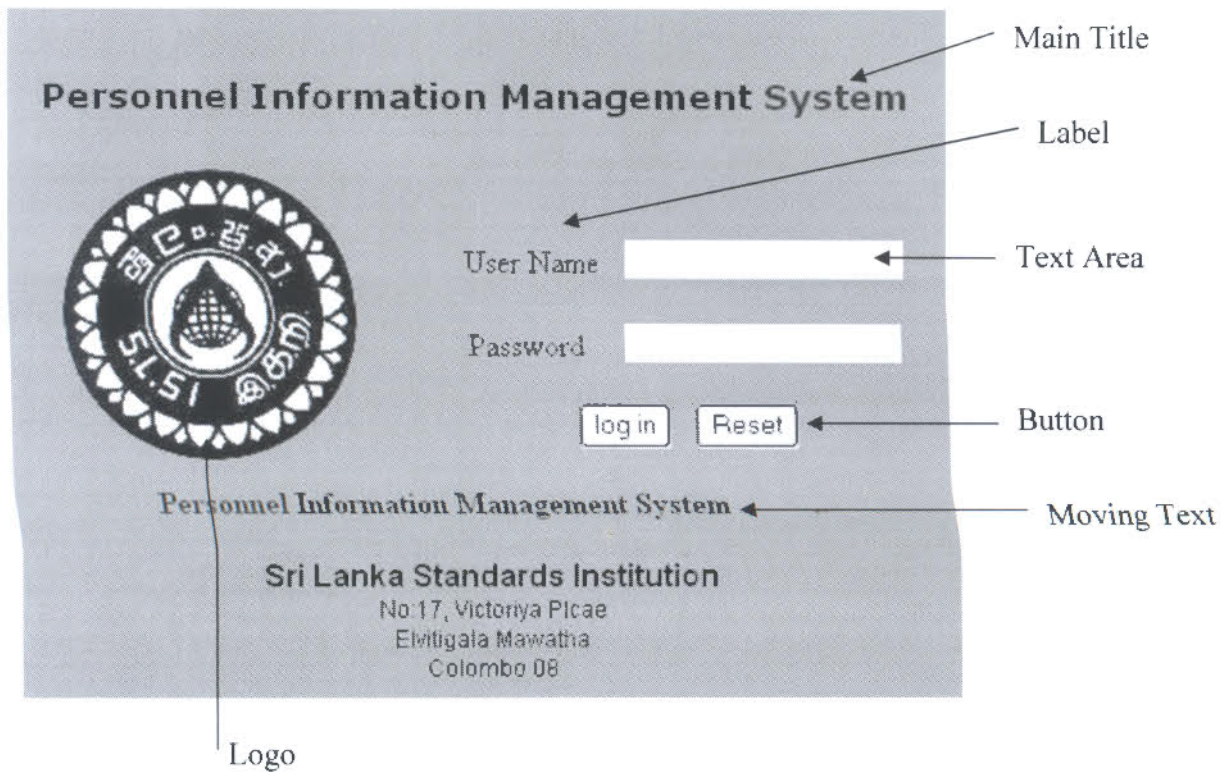
G.1 - Home page



G.2 - Tree navigator



Log-in page (Ref 0 interface)



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Vacancy add (Ref 1.1 interface)

Add Vacancy Information

Title of the interface →

Indicates required to fill →

*Post

Date of Publication (DD) (MM) (YYY)

Expected Qualification

Expected Experience

Benefits

Age Limit

Mode of Recruitment

No of Posts

Exam Marks / Weightage

	Selection Mark	Weightage (%)
P1	<input type="text"/>	<input type="text"/>
P2	<input type="text"/>	<input type="text"/>
P3	<input type="text"/>	<input type="text"/>

Exam total weightage(%)

Tot Exam Selection Mark

Interview Weightage(%)

Interview Pass Marks

Remarks

Submit button →

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Vacancy edit (Ref 1.2 interface)

Drop down list

Edit Vacancy Information

*Select the post go

Post: Standards Officer

Date of Publication: (DD) (MM) (YY)

Expected Qualification: Degree with a class

Expected Experience: 3 years industrial working exp

Benefits: Office transport

Age Limit: 0

Mode of Recruitment: Exam Interview

No of Posts: 15

Exam Marks / Weightage	Selection Mark	Weightage (%)
P1	50.45	4.44
P2	60.98	5.55
P3	60.98	5.55

Exam total weightage(%): 0.60

Exam Selection Mark: 200.66

Interview weightage(%): 0.40

Interview Marks: 34

Remarks:

Vacancy delete (Ref 1.3 interface)

Check box

Delete Vacancy Information

Standards Officer

Standards Engineer

Scientific Assistant

Appendix H

Important implementation codes

H.1 Print.css style sheet

```
@CHARSET "UTF-8";

.print_ignore {
    display: none;
}

body, table, th, td {
    color: #000000;
    background-color: #ffffff;
    font-size: 8pt;
}

img {
    border: 0;
}

table, th, td {
    border-width: 0.1em;
    border-color: #000000;
    border-style: solid;
}

table {
    border-collapse: collapse;
    border-spacing: 0;
    border-spacing: 0;
/*
    MARGIN-LEFT: 10% ;
    MARGIN-TOP: 5% ;

    MARGIN-RIGHT: 10% ;
    width : 80% ;
*/
}

th, td {
    padding: 0.2em;
}
```



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```
th {
  font-weight: bold;
  background-color: #e5e5e5;
  border-top: 3px solid ;
  border-bottom: 3px solid ;
}
```

```
@media print {
  .print_ignore {
    display: none;
  }
}
```

```
body, table, th, td {
  color: #000000;
  background-color: #ffffff;
  font-size: 12pt;
}
```

```
img {
  border: 0;
}
```

```
table, th, td {
  border-width: 1px;
  border-color: #000000;
  border-style: solid;
  border: none;
}
```

```
table {
  border-collapse: collapse;
  border-spacing: 0;
  /*MARGIN-LEFT: 10% ;
  MARGIN-TOP: 5% ;

  MARGIN-RIGHT: 10% ;
  width : 80% ; */
}
```

```
th, td {
  padding: 0.2em;
  align : left;
}
```

```
th {
```



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```

font-weight: bold;
background-color: #e5e5e5;
border-top: 1px solid ;
border-bottom: 1px solid ;

}
}

```

H.2 Query for update vacancy information

```

$query2 = "UPDATE vacancy set
post='$post',qua_expected='$qua',exp_expected='$exp', age_limit='$age', binifits='$ben',
mode_rec='$mode', p1_sel_marks='$p1m', p2_sel_marks='$p2m', p3_sel_marks='$p3m',
p1_weightage='$p1w', p2_weightage='$p2w', p3_weightage='$p3w',
selection_marks='$selmarks', int_weightage='$intw', no_of_posts='$noposts',
remarks='$remarks', tot_weightage='$selw',selection_marks_int='$int_marks' WHERE
vacancy_id='$aa'";

```

```

$result2 = mysql_query($query2) or die('Query failed: ' . mysql_error());

```

H.3 Checking username and password and hence granting the access to home page.

```

<?php
/* Initialize database access */
include 'library/config.php';
include 'library/opendb.php';

//assign user name and password entered to variables
@$username = $_POST["username"];
@$password = $_POST["password"];

// Start - Check wether the user name and password are correct.
$query = "SELECT *
FROM user_account
WHERE user_name='$username' AND
passwd='$password'";

$result = mysql_query($query) or die('Query failed: ' . mysql_error());

$row = mysql_fetch_array($result);

```

```

// Check whether user name and passwords are correct
if(mysql_num_rows($result)==0){ ?>
    <script type="text/javascript">
        alert("Invalid user name or password");
        window.location="login.php";
    </script>
    <?php
    }else{
        // If correct user name and password

/* Start - Get Log user ID and log time, and insert a record to user login table */
    $userid=$row['user_id'] ;
    $curDate=date("Y-m-d H,i,s");

    $query2 = "INSERT INTO user_login(log_id,user_id,login_time)
    values('$userid','$curDate')";
    $result2 = mysql_query($query2) or die('Query failed: ' . mysql_error());

    //start session
    session_start();
    $_SESSION['au_userid'] = $row['user_id'] ;

    //Directing to home page
    ?>
        <script type="text/javascript">
            window.location="index.php";
        </script>
    <?php
    }
    // close the database connection
    include 'library/closedb.php';
    ?>

```

H.4 JavaScript for select all and deselect all buttons

```

function SelectAll(){
    var rec=document.form1.noofrec.value;
    var j=0;
    while(j<rec) {
        document.form1.checkbox[j].checked=true;
        j=j+1;
    }
}
function DeselectAll(){
    var rec=document.form1.noofrec.value;

```


Appendix I

Test cases

I.1 Test case – vacancy add

Test Case ID	2			
Tested Component	Vacancy Add			
Tested Area	Functionality			
Purpose	Add vacancy to the system			
Prerequisites	Vacancy must not be an existing one in the system			
Tested by	Kanchana			
Tested Date	2008-10-01			
Test System	Windows XP, IntelP(IV) , Internet Explorer			
Test Data	Post name = {New, Existing, Empty } Vacancy details = {Valid , In-valid, Empty }			
Test Case Description				
No.	Test Case	Sample Data	Expected output	Results
1	Click on 'Add' menu item of Vacancy sub menu of Selection menu.		Display Vacancy Add page and enables to enter vacancy information	Pass
2	Enter new Post name & valid details. Then Click on 'Add this vacancy' button	Post= 'Standards Testing Officer', Date of Publication: DD=12 MM=12 YYYY=2008	Message "The Vacancy is successfully added" should be displayed.	Pass
3	Empty Post	Post= ""	Message "Enter the post" should be displayed.	Pass
4	Enter new Post name & enter invalid day. Then Click on 'Add this vacancy' button	Post= 'Standards Testing Officer', Date of Publication: DD=33	Message "Entered day value is out of rage. Expected valid day range is 1 to 31." should be displayed	Pass
5	Enter new Post name & enter invalid month. Then Click on 'Add this vacancy' button	Post= 'Standards Testing Officer', Date of Publication: MM=13	Message "Entered month value is out of rage. Expected valid month range is 1 to 12." should be displayed	Pass
6	Enter new Post name & enter valid day and empty month. Then	Post= 'Standards Testing Officer', Date of Publication: DD=12	Message "Please enter published month." should be displayed	Pass

	Click on 'Add this vacancy'' button	MM= ""		
7	Enter new Post name & enter valid month and empty day. Then Click on 'Add this vacancy'' button	Post= 'Standards Testing Officer', Date of Publication: MM=11 DD= ""	Message"Please enter published day." should be displayed	Pass
8	Enter new Post name & enter in valid year. Then Click on 'Add this vacancy'' button	Post= 'Standards Testing Officer', Date of Publication: DD=12, MM=12, YYYY=1111111111	Message"Date entered is invalid. Please enter a valid date." should be displayed	Pass
9	Enter new Post name & enter valid date and keep all specified paper marks and interview pass marks are empty. Then Click on 'Add this vacancy'' button	Post= 'Standards Testing Officer', Date of Publication: DD=12, MM=12, YYYY=2008 P 1=0 P 2=0 P 3=0 Interview pass marks=0 Weighted averages For p1=0, p2=0, p3=0 and for interview marks=0	Message" Either all exam marks or interview marks can not be empty." should be displayed	Pass
10	Enter new Post name & enter valid date. Then enter any alpha numeric to any marks or weighted average field. Then Click on 'Add this vacancy'' button	Post= 'Standards Testing Officer', Date of Publication: DD=12, MM=12, YYYY=2008 e.g. For p1= 'test'	Message" Please enter only numbers for exam paper selection marks." should be displayed	Pass
11	Enter new Post name & enter valid date. Sum of weighted average marks assigned to total exam marks and interview marks exceed 1.	Post= 'Standards Testing Officer', Date of Publication: DD=12, MM=12, YYYY=2008 e.g. total exam weighted average= 0.7	Message" Total of weighted averages should not exceed 1." should be displayed	Pass

	Then Click on 'Add this vacancy'' button	interview weighted average= 0.6		
12	Enter new Post name & enter valid date. Enter exam marks for any paper and keep weighted average marks empty for the relevant paper. Then Click on 'Add this vacancy'' button	Post= 'Standards Testing Officer', Date of Publication: DD=12, MM=12, YYYY=2008 e.g. P1=60 weighted average mark for p1= 0	Message'' Weighted average should not be empty as Paper 1 marks is not zero.'' should be displayed	Pass
13	Enter new Post name & enter valid date. Enter interview pass mark and keep weighted average marks empty for the interview. Then Click on 'Add this vacancy'' button	Post= 'Standards Testing Officer', Date of Publication: DD=12, MM=12, YYYY=2008 interview pass mark=50 and set interview weighted average to zero	Message'' Weighted average should not be empty as interview marks is not zero.'' should be displayed	Pass
14	Enter new Post name & enter valid date. Keep interview pass marks empty and enter weighted average marks for the interview. Then Click on 'Add this vacancy'' button	Post= 'Standards Testing Officer', Date of Publication: DD=12, MM=12, YYYY=2008 interview pass mark=0 and set interview weighted average to 0.5	Message'' Weighted average should be empty as interview marks is zero.'' should be displayed	Pass
15	Enter new Post name & enter valid date. Keep exam marks for a paper empty and enter weighted average marks for the relevant paper. Then Click on 'Add this vacancy'' button	Post= 'Standards Testing Officer', Date of Publication: DD=12, MM=12, YYYY=2008 e.g. weighted average mark for p2= 0.5 P1=0	Message'' Weighted average should be empty as Paper 1 marks is zero.'' should be displayed	Pass


Figure I.1 - Test Case – Vacancy Add

Appendix J


Grammatical analysis


Grammatical analysis was carried out for the purpose of identifying entity classes.

Nouns		Verbs
(Class)	(Attributes)	(Methods)
Applicant	Full Name Name with initial Address Sex Age DOB Religion Nationality NIC Educational Qualification Professional Qualification Working Experiences Application no Exam paper Marks Interview Marks	Add Edit Delete Validate Show Applicant Content Enter Exam Marks Enter Interview Marks Enter Final Evaluation Marks Enter Appointment Records Check Exam Marks Exist Check Interview Marks Exist Check Appointment Records Exist Check Final Evaluation Marks Exist Check Applicant Exist
Vacancy	Date of publication Post Qualifications Expected Experience Expected Age limit	Add Edit Delete Validate Show Vacancy List Show Vacancy Content Check Vacancy Exist

	Benefits Mode of Recruitment Paper Pass Marks Interview Pass Marks Exam Weightage Interview Weightage No of Posts	
Exam	Name of Exam Papers Date Time Place Medium	Enter Exam Information Show Exam Content Validate
Admission Cards	Exam Index No 	Enter Index nos Show Index nos Validate
Employee	Full Name Name with initial Personnel File No Address Sex Age DOB Religion Nationality NIC Educational Qualification	Add Edit Delete Show Employee list Show Employee Content Check Employee Exist Validate

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	Professional Qualification Working Experiences Telephone Email Language Fluency Job Status Pass port no Date of Recruitment Grade Category Designation	
Division	 Name Director	Add Edit Delete Show Division List Show Division Content Check Division Exist Check Employee Exist Validate
Section	Name Division In-charge	Add Edit Delete Validate Show Section List Show Section Content Check Section Exist
Dependent	Name Sex Relationship	Add Edit Delete Validate Show Dependent List Show Dependent Content Check Dependent Exist

Assign Employee	Employee Division From Date To Date	Add Edit Delete Validate Show Assign Employee List Show Assign Employee Content
EPF/ETF	EPF No EPF Forms Sent EPF B Form Received ETF K Certified	Show EPFETF Records Enter EPFETF Records
Designation	Name	Add Edit Delete Validate Show Designation List Show Designation Content Check Designation Exist Check Employee Exist
Grade	Name 	Add Edit Delete Validate Show Grade List Show Grade Content Check Grade Exist Check Employee Exist
System User Account	User Name Password Employee	Add Edit Delete Validate Show User Account List Show User Account Content Check User Account Exist Check Employee Exist
User Category	Category Description	Add Edit Delete Validate Show User Category List Show User Category Content Check User Category Exist Check User Account Exist
System Facility	System Facility	Add

	Description	Edit Delete Validate Show System Facility List Show System Facility Content Check System Facility Exist Check User Account Exist
Assign System Facility	System facility	Show System Facility
	User Category	Assign System Facility
Login	User name	Add Log User
	Password	Check User Name and Password Correct
Print Report	Report Name	Display Reports
		Print Reports

Table J.1- Grammatical Analysis



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Existing system requirements

Req. Id	Requirement
01. Employee selection	
01.1	The system shall be able identify vacancies from Man Power Plan.
01.2	The system shall be able prepare relevant advertisements.
01.3	The system shall be able to short list applications.
01.4	The system shall prepare a document including general information (Full Name, Age, Sex, Address, NIC etc) of Qualified Applicants (after short listed applications)
01.5	The system shall be able to prepare a list of Qualified Applicants.
01.6	The system shall be able to prepare a list of Disqualified Applicants.
01.7	The system shall be able to prepare Admission Card and the covering letter to qualified applicants
01.8	The system shall be able to prepare Attendance Sheets for the exam/test to be carried out.
01.9	The system shall keep exam results of qualified applicants. Final marks of applicants will be weighted average if there are more than written exam papers or on site practical exams.
01.10	The system shall prepare exam summary report.
01.11	The system shall prepare a document including general information and additional information like educational and professional qualifications, working experience etc. prior to exams is conducted.
01.12	The system shall keep details of interview conducted of each applicant.
01.13	The system shall prepare interview summary report.
01.14	The system shall keep details of evaluation results of applicants
01.15	The system shall prepare a Final Evaluation Report after evaluation is carried out.
01.16	The system shall prepare letters to those who have not been selected
01.17	The system shall prepare a List of Selected Applicants.

2. Employee recruitment	
02.1	The system shall be able prepare appointment letters to selected applicants.
02.2	The system shall keep track of whether the selected applicants accept the appointments.
02.3	The system shall be able to keep track of those who submit filled main documents. Those are as follows: <ul style="list-style-type: none"> ✓ Medical repots ✓ Personnel Information Form ✓ Confidentially Agreement ✓ OATH of Affirmation ✓ Personnel Declaration Letter etc.
02.4	The system shall open a personnel file for each new recruit. It shall keep the following types of information/documents throughout whole emplacement. <ul style="list-style-type: none"> ✓ Application Form ✓ Copy of Birth Certificate ✓ Educational Qualifications ✓ Professional Qualifications ✓ Working experiences ✓ Dependencies Information ✓ Copy of NIC ✓ Dependency Information ✓ Letters acknowledging Promotions ✓ Performance Appraisal Forms
02.5	The system shall be able to prepare Division/Section Allocation Letters for each new recruit.
03. EPF/ETF handling	
03.1	The system shall be able to assign an EPF no to new recruit and include the name of the employee to the EPF Register.
03.2	The system shall keep a record when employees submit relevant EPF 'A', 'B', 'H' forms after filling to the administration division.
03.2	The system shall be able to keep these filled EPF forms in a file called EPF file.
03.4	The system should keep a record whether EPF 'A', 'B', 'H' forms have been

	sent to labour department.
03.5	Upon receivable of EPF 'B' form, the system should update personnel file and it Should be able to identify which 'B's have no been received yet to the SLSI by the labour department.
03.6	The system shall provide details of those who have retired / terminated from the service and it shall able to know those who have obtained ETF 'K' form certified by SLSI.



Appendix L

Data dictionary

Term	Type	Purpose
Admin Clerk	Actor	The person who is attached to the administration division for clerical works.
Admin Secretary	Actor	The secretary to the director administration
Admin Staff Assistant	Actor	The third in the hierarchy of Administration division.
Employee	Actor	Any employee in Sri Lanka Standards Institution
Employees Selection	Use Case	The functionality which describes the employee selection activities.
Employee Recruitment	Use Case	The functionality which describes the employee recruitment activities.
EPF/ETF Handling	Use Case	The functionality which describes the employee's EPF/ETF handling activities.
System Administration	Use Case	The functionality which describes the system administrator's activities.
Manage Vacancy Information	Use Case	The functionality which describes the adding, editing, deleting of vacancy information.
Manage Applicant General Information	Use Case	The functionality which describes the adding, editing, deleting of applicants information.
Generate Admission Card / Letter	Use Case	The functionality which describes generating of Admission cards / letters
Enter Exam Details	Use Case	The functionality which describes entering of examination general details.
Enter Exam Index Nos	Use Case	The functionality which describes entering of exam index nos of employees
Enter Exam/Test	Use Case	The functionality which describes entering of



Marks		examination marks.
Enter Interview Marks	Use Case	The functionality which describes entering of interviews marks.
Enter Final Evaluation Information	Use Case	The functionality which describes entering of final evaluation records.
View / Print Reports	Use Case	The functionality which describes viewing and getting print outs of repots.
Keep Job Appointment Records	Use Case	The functionality which describes entering of job appointment records.
Manage Employee's General Information	Use Case	The functionality which describes the adding, editing, deleting of employees information.
Manage Dependant Information	Use Case	The functionality which describes the adding, editing, deleting of dependents information.
Manage Division Information	Use Case	The functionality which describes the adding, editing, deleting of divisions information.
Manage Section Information	Use Case	The functionality which describes the adding, editing, deleting of sections information.
Manage Assigning of Employee to Division/Section	Use Case	The functionality which describes assigning employees to a particular section.
Manage Designation Information	Use Case	The functionality which describes the adding, editing, deleting of designations information.
Manage Grade Information	Use Case	The functionality which describes the adding, editing, deleting of grades information.
Mange EPF Information	Use Case	The functionality which describes entering of EPF information.
Manage ETF Information	Use Case	The functionality which describes entering of ETF information
Manage User Category Information	Use Case	The functionality which describes the adding, editing, deleting of user category information.

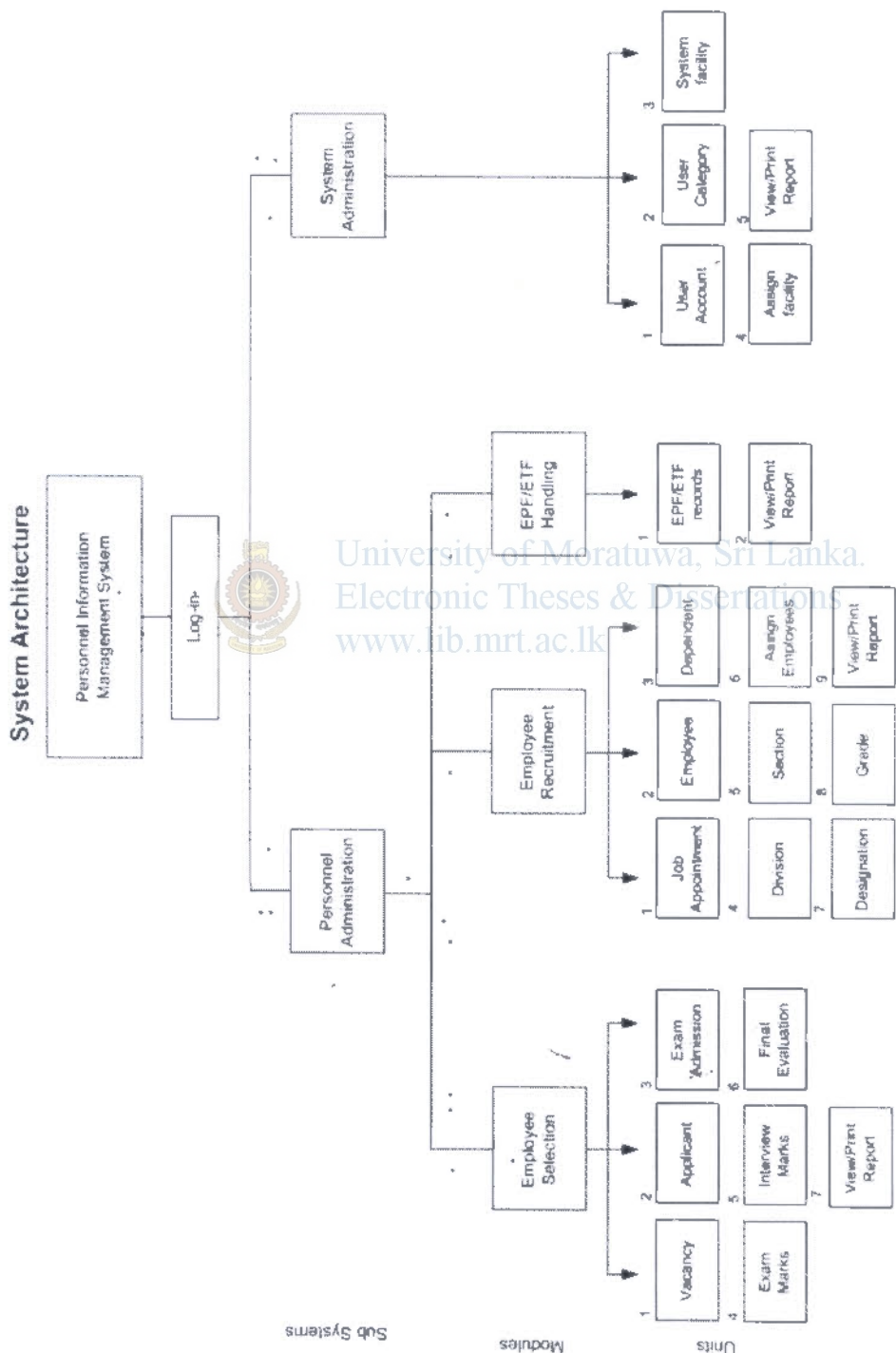
Manage System Facility Information	Use Case	The functionality which describes the adding, editing, deleting of systems facilities information.
Assign System Facilities to User Category	Use Case	The functionality which describes assigning of systems facilities to a particular user category.
Manage System User Account Information	Use Case	The functionality which describes the adding, editing, deleting of system user accounts information.
SLSI	Abbreviation	Sri Lanka Standards Institution
PIMS	Abbreviation	Personnel Information Management System
GUI	Abbreviation	Graphical User Interface

Table L.1- Data Dictionary



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Relationship between system architectural design and PHP files



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Subsystems / Units of the Architectural Design	.PHP File(s)
Vacancy	
Add	VacancyAdd, VacancyAdd_process
Edit	VacancyEdit, VacancyEdit_process
Delete	VacancyDelete, VacancyDelete_process
Applicant	
Add	ApplicantAdd, ApplicantAdd_process
Edit	ApplicantEdit, ApplicantEdit_process
Delete	ApplicantDelete, ApplicantDelete_process
Exam Admission	AdmissionCardSearch, AdmissionCardPrint
Exam Marks	ExamMarks, ExamMarks_Process
Interview Marks	InterviewMarks, InterviewMarks_process
Final Evaluation Records	FinalEvaluation, FinalEvaluation_process
View / Print reports - Employee Selection	Absent_Exam_Rep, Absent_Interview_Rep, App_NonQualified_Inte_List_Rep, App_NonQualified_List_Rep, App_Qualified_Inte_List_Rep, Attendance_Exam_List_Rep, Attendance_Interview_List_Rep, Final_Evaluation_Rep, Infor_For_Interview_Rep, Interview_Marks_Rep, List_For_Interview_Rep, Non_Selected_Applicant_List_Rep, Selected_Applicant_List_Rep, Set_ExamMarks_Rep
Job Appointment	Appointment, Appointment_process
Employee	
Add	EmployeeAdd, EmployeeAdd_process
Edit	EmployeeSearch, EmployeeEdit, EmployeeEdit_process
Division	
Add	DivisionAdd, DivisionAdd_process
Edit	DivisionEdit, DivisionAdd_process
Delete	DivisionDelete, DivisionDelete_process
Section	



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Add	SectionAdd, SectionAdd_process
Edit	SectionEdit, SectionEdit_process, SectionSearch
Delete	SectionDelete, SectionDelete_process,
Assign Employee	
Add	AssignEmployeeAdd, AssignEmployeeAdd_process
Edit	AssignEmployEdit, AssignEmployeeEdit_process, AssignEmployeeSearch
Delete	AssignEmployDelete, AssignEmployeeDelete_process,
Dependent	
Add	DependantAdd, DependantAdd_process
Edit	DependantEdit, DependantEdit_process, DependantSearch
Delete	DependantDelete, DependantDelete_process
Designation	
Add	DesignationAdd, DesignationAdd_process
Edit	DesignationEdit, DesignationEdit_process, DesignationSearch
Delete	DesignationDelete, DesignationDelete_process,
Grade	
Add	GradeAdd, GradeAdd_process
Edit	GradeEdit, GradeEdit_process, GradeSearch
Delete	GradeDelete, GradeDelete_process
View / Print reports - Employee Recruitment	Dependancy_Rep, Designation_List_Rep, Division_List_Rep, Division_Wise_Section_Rep, Employee_Category_Wise_Rep, Employee_Designation_Wise_Rep, Employee_Division_Wise_Rep, Employee_General_Info_Rep, Employee_Grade_Wise_Rep, Employee_Section_Wise_Rep, Employee_Working_History_Rep, Grade_List_Rep, Job_Accepted_List_Rep, PFileNo_List_Rep, Recruitment_Rep, Retired_Terminate_Rep
EPF/ETF Handling	EPFETF, EPFETF_process

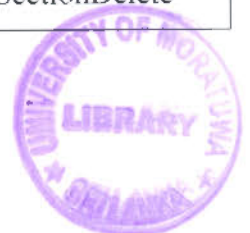
View / Print reports - EPF/ETF Handling	EPF_FormB_Received_List_Rep, EPF_Forms_Received_List_Rep, EPF_Forms_Sent_List_Rep, EPF_No_List_Rep, EPFETF_Rep, ETF_FormK_Certified_List_Rep, ExamIndex_List_Rep, ExamMarks_Rep.
System User Account	
Add	UserAccountAdd, UserAccountAdd_process
Edit	UserAccountEdit, UserAccountEdit_process,
Delete	UserAccountDelete, UserAccountDelete_process
User Category	
Add	UserCategoryAdd, UserCategoryAdd_process
Edit	UserCategoryEdit, UserCategoryEdit_process
Delete	UserCategoryDelete, UserCategoryDelete_process
System Facility	
Add	SystemFacilityAdd, SystemFacilityAdd_process
Edit	SystemFacilityEdit, SystemFacilityEdit_process, SystemFacilitySearch
Delete	SystemFacilityDelete, SystemFacilityDelete_process
Assign facilities	AssignFacilityCategory, AssignFacilityCategory_Process
View / Print reports - System Administrator	UserAccount_List UserCategory_List SystemFacility_List Login_Rep

Table M.1- Relationship between System Architectural Design and PHP Files

Appendix N

Relationship between classes and PHP files

Class	.PHP File(s)
Log in	Login, login_process
Vacancy	VacancyAdd_process, VacancyEdit_process, VacancyDelete_process
Vacancy Page	VacancyAdd, VacancyEdit, VacancyDelete,
Applicant	ApplicantAdd_process, ApplicantEdit_process, ApplicantDelete_process, ExamMarks_Process, InterviewMarks_process, FinalEvaluation_process, Appointment_process
Applicant Page	ApplicantAdd, ApplicantEdit, ApplicantDelete,
Admission Card	AdmissionCardPrint
Admission Card Page	AdmissionCardSearch
Exam	ExamInfo_process
Exam Page	ExamInfo
Exam Marks Page	ExamMarks
Interview Marks Page	InterviewMarks
Final Evaluation Page	FinalEvaluation
Job Appointment Page	Appointment
Selection Reports Page	SelectionReports
Employee	EmployeeAdd_process, EmployeeEdit_process
Employee Page	EmployeeAdd, EmployeeSearch, EmployeeEdit,
Division	DivisionAdd_process, DivisionEdit_process, DivisionDelete_process
Division Page	DivisionAdd, DivisionEdit, DivisionDelete,
Section	SectionAdd_process, SectionDelete_process, SectionEdit_process
Section Page	SectionAdd, SectionEdit, SectionSearch, SectionDelete



Assign Employee	AssignEmployeeAdd_process, AssignEmployeeEdit_process, AssignEmployeeDelete_process
	AssignEmployeeAdd, AssignEmployEdit, , AssignEmployeeSearch, AssignEmployDelete
Dependent	DependantAdd_process, DependantEdit_process, DependantDelete_process
Dependent Page	DependantAdd, DependantEdit, DependantSearch, DependantDelete
Designation	DesignationAdd_process, DesignationEdit_process, DesignationDelete_process
Designation Page	DesignationAdd, DesignationEdit, , DesignationSearch, DesignationDelete
Grade	GradeAdd_process, GradeEdit_process, GradeDelete_process
Grade page	GradeAdd, GradeEdit, , GradeSearch, GradeDelete
Recruitment Reports Page	Recruitment Rep
EPF/ETF	EPFETF_process
EPF/ETF Page	EPFETF
EPFETF Reports Page	EPFETF_Rep
System User Account	UserAccountAdd_process, UserAccountEdit_process. UserAccountDelete_process
System User Account page	UserAccountAdd, UserAccountEdit, UserAccountDelete
User Category	UserCategoryAdd_process, UserCategoryEdit_process, UserCategoryDelete_process
User Category Page	UserCategoryAdd, UserCategoryEdit, UserCategoryDelete
System Facility	SystemFacilityAdd_process, SystemFacilityEdit_process, SystemFacilityDelete_process
System Facility page	SystemFacilityAdd, SystemFacilityEdit, SystemFacilitySearch. SystemFacilityDelete
Assign facilities	AssignFacilityCategory_Process
	AssignFacilityCategory

Administrator Reports Page	Administrator_Rep
Print Report	<p><i>For Employee Selection</i></p> <p>Absent_Exam_Rep, Absent_Interview_Rep, App_NonQualified_Inte_List_Rep, App_NonQualified_List_Rep, App_Qualified_Inte_List_Rep, Attendance_Exam_List_Rep, Attendance_Interview_List_Rep, Final_Evaluation_Rep, Infor_For_Interview_Rep, Interview_Marks_Rep, List_For_Interview_Rep, Non_Selected_Applicant_List_Rep, Selected_Applicant_List_Rep, Set_ExamMarks_Rep</p> <p><i>For Employee Recruitment</i></p> <p>Dependency_Rep, Designation_List_Rep, Division_List_Rep, Division_Wise_Section_Rep, Employee_Category_Wise_Rep, Employee_Designation_Wise_Rep, Employee_Division_Wise_Rep, Employee_General_Info_Rep, Employee_Grade_Wise_Rep, Employee_Section_Wise_Rep, Employee_Working_History_Rep, Grade_List_Rep, Job_Accepted_List_Rep, PFileNo_List_Rep, Recruitment_Rep, Retired_Terminate_Rep</p> <p><i>For EPFETF Handling</i></p> <p>EPF_FormB_Received_List_Rep, EPF_Forms_Received_List_Rep, EPF_Forms_Sent_List_Rep, EPF_No_List_Rep, EPFETF_Rep, ETF_FormK_Certified_List_Rep, ExamIndex_List_Rep, ExamMarks_Rep,</p>



	<i>For Administrator</i> UserAccount_List UserCategory_List SystemFacility_List Login_Rep
--	--------------------------------------------------------------------------------------------------------------

Table N.1- Relationship between Classes and PHP Files



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User manual

The user manual is documented so that it provides general instructions on how to use the system utilities provided in the proposed PIMS. This will ease the understandability of users of the system and use it as a reference document. The general principle, which should guide the user, is to get the best, most complete, and most accurate information in every case.

A video enabled help files system has been added to the software every where it is expected to have so that any user can open it and have a look at it. This will ease and comfort of using the system without any difficulty and hesitation.

Following sections describes the way of make use of each of available system utility.

P.1 How to log-in to the system

Any user has to log in to the system with a user name and password.

- ✓ Enter Correct URL
- ✓ Then System will display the log-in interface (Ref 0 interface)
- ✓ Enter User Name
- ✓ Enter Password
- ✓ If you need to clear user name and password you entered then click on 'Reset' button. Otherwise click on 'Log in' button.
- ✓ If the user login to the system at very first time then he/she will allow to change the password. If the new password and the re-entered password are same then the Home page will be displayed.

P.2 How to add new 'Vacancy'

Select 'Selection' → 'Vacancy' → 'Vacancy Add' on the tree navigator. Then system will show Ref 1.1 interface.

- ✓ Enter a new name for post applied
- ✓ Enter other information as necessary
- ✓ Click on 'Add' button when the user finishes entering vacancy details.

- ✓ If the data entered is invalid then the system will show a message and you will be prompted to rectify the input data value.
- ✓ System will show a message 'Vacancy is successfully Add'.

P.3 How to edit an existing 'Vacancy'

Select 'Selection' → 'Vacancy' → 'Vacancy Edit' on the tree navigator. Then system will show Ref 1.2 interface.

- ✓ Select the 'vacancy' from the drop down list.
- ✓ Click on 'go'. Then system will display the content of the selected post.
- ✓ Change the existing content as necessary.
- ✓ Click on 'Edit button when the user finishes changing existing vacancy details.
- ✓ If the data changed is invalid then the system will show a message and you will be prompted to rectify the input data value.
- ✓ If the data change is valid then the system will show the message 'The Vacancy is successfully edited'

P.4 How to delete an existing 'Vacancy'

Select 'Selection' → 'Vacancy' → 'Vacancy Delete' on the tree navigator. Then system will show Ref 1.3 interface.

- ✓ Select vacancy or vacancies you want to delete. There are two ways of selecting vacancy or vacancies.
- ✓ Click on the relevant check box
- ✓ Click 'Select All' button to select all the vacancies at once.
- ✓ If you want to de-select any vacancy that you have already selected as in the above, you can do it
- ✓ Click on the selected check box
- ✓ Click 'De-select All' button to de-select all the vacancies at once.
- ✓ Click 'Delete' button
- ✓ System will ask to confirm delete.
- ✓ If you click 'yes' then vacancy or vacancies will be deleted if applicants have not been assigned to the vacancy and display 'Vacancy or Vacancies deleted successfully'. If applicants are existed then system will display 'Vacancy can not be deleted.'

Software Evaluation Form

Dr. / Mr. / Mrs. / Miss.

Job Title: Director General / Deputy Director General / Director / Assistant Director / Standards Testing Officer / Staff Assistant / Clerk / Other

Operating System: Windows 2000 / XP / Vista / NT / Linux / Other

Web Browser: Internet Explorer / Fire Fox / Other

01. Functionality: Whether the software provides all the required functionalities expressed by the users of the system.

- a. Not provide []
- b. Provide sufficiently, no need further functionalities []
- c. Provide sufficiently, but need further functionalities []
- d. Provide all functionalities expressed, no need further development []
- e. Provide all functionalities expressed, but need further development []
- f. Other (If any) []

02. Understandability: Whether you can understand how to use the software to do a particular task.

- a. Software can not be understood at all []
- b. Software can not be understood properly []
- c. Software can be understood easily []
- d. Software can be understood easily but little bit extra effort is needed []
- e. It is difficult to understand []
- f. Other (If any) []

03. Learnability: Whether you can easily learn the software without any obstacles and hesitation.

- a. Help system does not provides necessary assistant to understand the software []
- b. Help system provides sufficiently necessary assistant to understand the software []
- c. Help system provides comprehensively necessary assistant to understand the software []
- d. Help system is not relevant to the context []
- e. Help system is relevant to the context []
- f. Other (If any) []

04. Operability: Whether you need extra skill / knowledge to use the software to do your tasks through it.

- a. No need extra skill / knowledge []
- b. Skill / knowledge is sufficient to operate the software []
- c. Need extra skill / knowledge []
- d. Need IT unit assistant []
- e. Other (If any) []

05. Attractiveness: Whether you like to use the software

- a. The colors, fonts, message boxes, form navigation, forms used are not suitable. []
- b. The colors, fonts, message boxes, form navigation, forms used are suitable, no confusion and hesitation. []
- c. The colors, fonts, message boxes, form navigation, forms used are excellent, no confusion and hesitation. []
- d. Need more attractiveness to the system []
- e. Other (If any) []

06. Efficiency: Whether system is efficient than the previous manual operation.

- a. Not efficient []
- b. Efficient (less) []
- c. Efficient (intermediately) []
- d. Efficient (more) []
- e. Other (If any) []

07. Installability: Whether the software can be installed and configured in a given environment.

- a. Not easy to install and configure []
- b. Easy to install and configure []
- c. Difficult to install and configure []
- d. Need skill / knowledge to install and configure []
- e. Other (If any) []

08. Other Comments

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