Sri Lanka Institute of Information Technology

Online Zoo Management System for Zoo Melaka

Project Report

Information Technology Project 2021

Project ID: ITP2021_S2_B15_G01

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12-10-2021

Declaration

We hereby declare that our project report is not done by any individual outside the group or any other organization. This project doesn't contain any plagiarized material to the best of our knowledge.

Project information

Project Title	Online Zoo Management System for Zoo Melaka
Project ID	ITP2021_S2_B15_G01

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Abstract

Zoo Melaka, which is a reputed zoological park, based in Ayer Keroh, Malaysia, was in dire need of a properly integrated and fully – operational, computerized management system which wholly encompasses the core aspects of a zoo comprising of intra and extra personnel organization, research administration, medicinal archives and animal supervision as well as facilitating adoptions as required in a prompt and orderly manner. Henceforth, with much undertaking have achieved a resolution to this dilemma by implementing an application capable of tackling such managerial problems. After months of investigation and examination, furthermore, succeeded in covering the scope of a wide range of difficulties encountered during the current organizational procedures of the zoo and executed model, with the best of the ability to mitigate these drawbacks with proper usage of MongoDB, Express, React and NodeJS technologies. The final product can deliver Create, Retrieve, Update, Delete, Search and Validation tasks coupled with user-friendly interfaces with quality. Sincerely expect that exertions would benefit Zoo Melaka with superior progress to meet the system requirements and design criteria presented to at the onset of the project. Implemented system serves as a perfect illustration of teamwork and productivity.

Acknowledgement

First and foremost, Project team would like to genuinely appreciate the endeavors of Lecturer-in-Charge of the Information Technology Project module, Ms. Geethanjali Wimalaratne and associate lecturers for affording the opportunity to team up and cooperate on such a robust and challenging project.

A special tribute is dedicated to Mr. Mr. Majlis Perbandaran Huang Tuah Jaya, who has been a prominent and leading figure as the client representative, acting as an intermediary between Zoo Melaka and the team, as well as presenting to this once in a lifetime prospect of developing an automated zoological management system for a foreign zoo, whose insightful comments and practical advice has proved invaluable to us throughout the span of the project.

Finally, to all members who were involved with the successful completion of this project, it was truly wonderful sharing online premises and time.

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1. Introduction

1.1 Problem Statement

During the pre-covid pandemic, the Zoo Melaka Zoo logical institute was incorporated with a manual system, where through the whole chain of processes, physical impact on the process is considerably high. Apart from using different industrially available software for different purposes, the company didn't use a management system which integrate each function which reduces data redundancy and inconsistency and minimizing the physical footprint throughout the chain of process. During the covid pandemic period, accessing the physical documents was much harder since to just to check a simple file, people had to go to the document archives and request the relevant documents, and secondly, since the same hard copy of the document is handled by many people, it gave rise to a risk of spread of the corona virus. The customers of the zoological institution had also requested from the zoological institute for an online ticket booking and tour guide booking system along with a portal to get notified of upcoming volunteer projects. Since the manual system, brought out more new difficulties in using the system during the covid pandemic period, the Zoo Melaka Zoological institution needs an organized, last longing, efficient system is needed to eliminate all the above-mentioned problems, furthermore, a system which would be even feasible in using during the post pandemic period.

1.2 Product Scope

The Zoo Management system designed for Zoo Melaka Zoological institute comprises of functions such as

Listed down below

1.Customer Service Management

2.Member /Visitor Management

3.Animal Adoption Management

4.Employee Management

5.Animal Management

6.Project Management

7.Medical Records Handling

8.Research Documents Handling

Collectively using each function minimizes data redundancy and data inconsistency. By defining proper rules to each role, the security can be granted. The UI/UX of the system is made following the relevant standards which ensures customer satisfaction.

1.3 Project Report Structure

- Methodology explains how the project is done and what are steps followed when developing this product. Under that the requirements gathered from the client and the analysis of the requirements is explained. The diagrams used when developing this product is also explained. Furthermore, the implementation and test cases of the product are also explained.
- An overall summary of the product is explained in the Conclusion.
- All the referred documents and websites are mentioned in the References.
- Appendix A includes all the diagrams used when developing the product.
- Appendix B includes the test results of the product.
- Appendix C includes some selected code segments of a main function of the system

2. Methodology

2.1 Requirements and Analysis

Customer Service Management

Mainly focuses on Customer/Visitor entity side related activities whereas providing feedback & requesting tour bookings from "Zoo-Melaka". Which is performed on an online portal-based manner. Visitors can provide booking details in the 'Request Booking form' and that record is passed to the system to verify current resources are available or not such as date, time, and the selected Tour Guide. If the user selected resources aren't available in the zoo,

System will automatically notify user as well as C.R.A (Customer Relation Admin) who oversees handling bookings. Moreover, Visitors can request to update or delete booking by contacting C.R.A. Afterwards C.R.A can perform creating, updating, deleting & searching booking records from the 'Tour Guide Dashboard' via the frontend and operations are passed to the backend to perform and interact with the database. In addition, C.R.A can generate a report from the U.I for a specific booking record or all the booking records and later stored in the database of the system

Figure 2.1.1 : Customer Service Management Use Case Diagram

Member/Visitor Management

In the Member/visitor management function users can first register by entering first name, last name, username, email and password. After registering once, the registered user can login to the system by entering the email and the password. Registered users can update profile details and delete profiles at any given time. Users can generate a report of his account. Administrators can manage user accounts such as update profile details and delete users and generate a report of the user accounts.

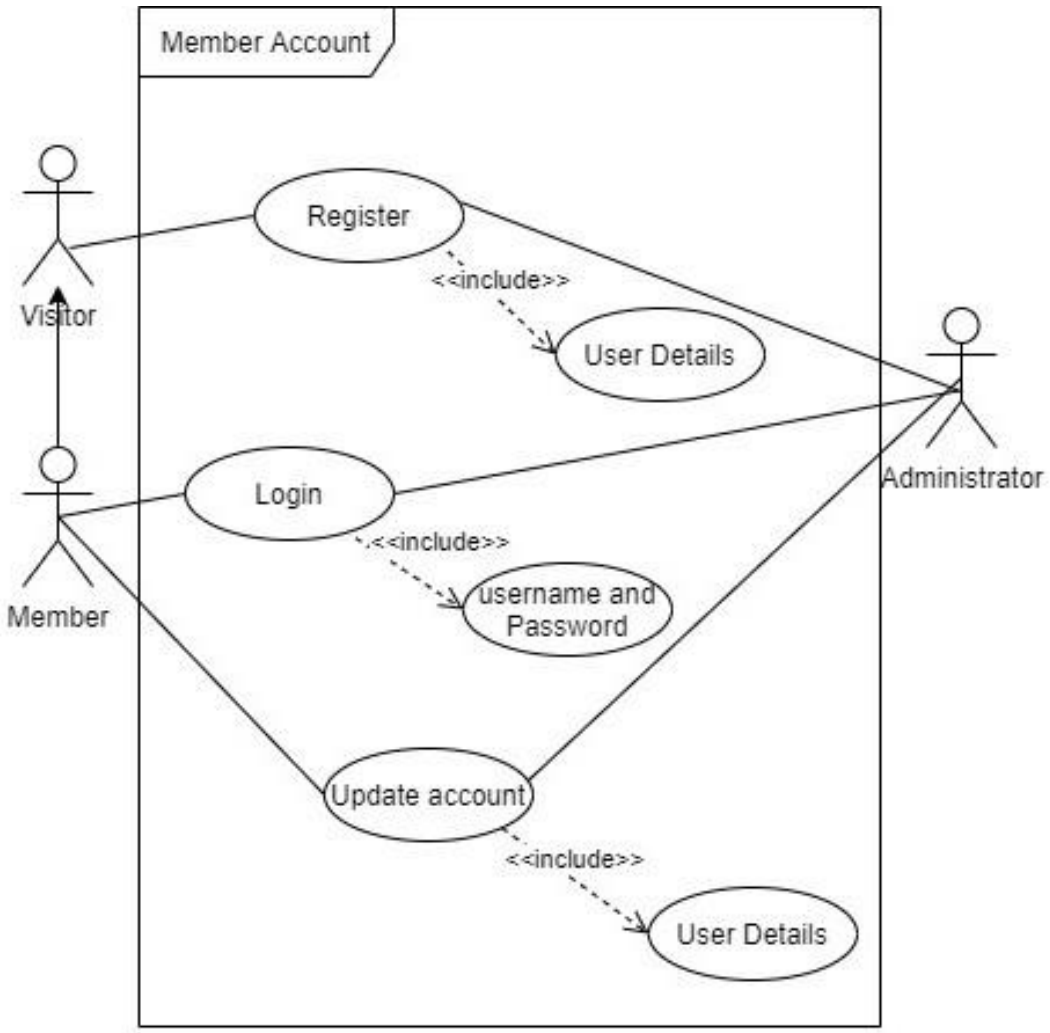


Figure 2.1.2 : Member /Visitor Management Use Case Diagram

Animal adoption

Animal adoption is mainly a fund-raising project which benefits users and the zoo for conservation work. As for the adoption management, the system must store details about adoption records with member details and animal details. When a member has adopted an animal, he/she can give a name for the animal and choose an adoption plan. Which is also can be edited or cancel the plan after the adoption process has been done. As an admin in system can see all the adoption records and manage each one of the records and generate reports accordingly.

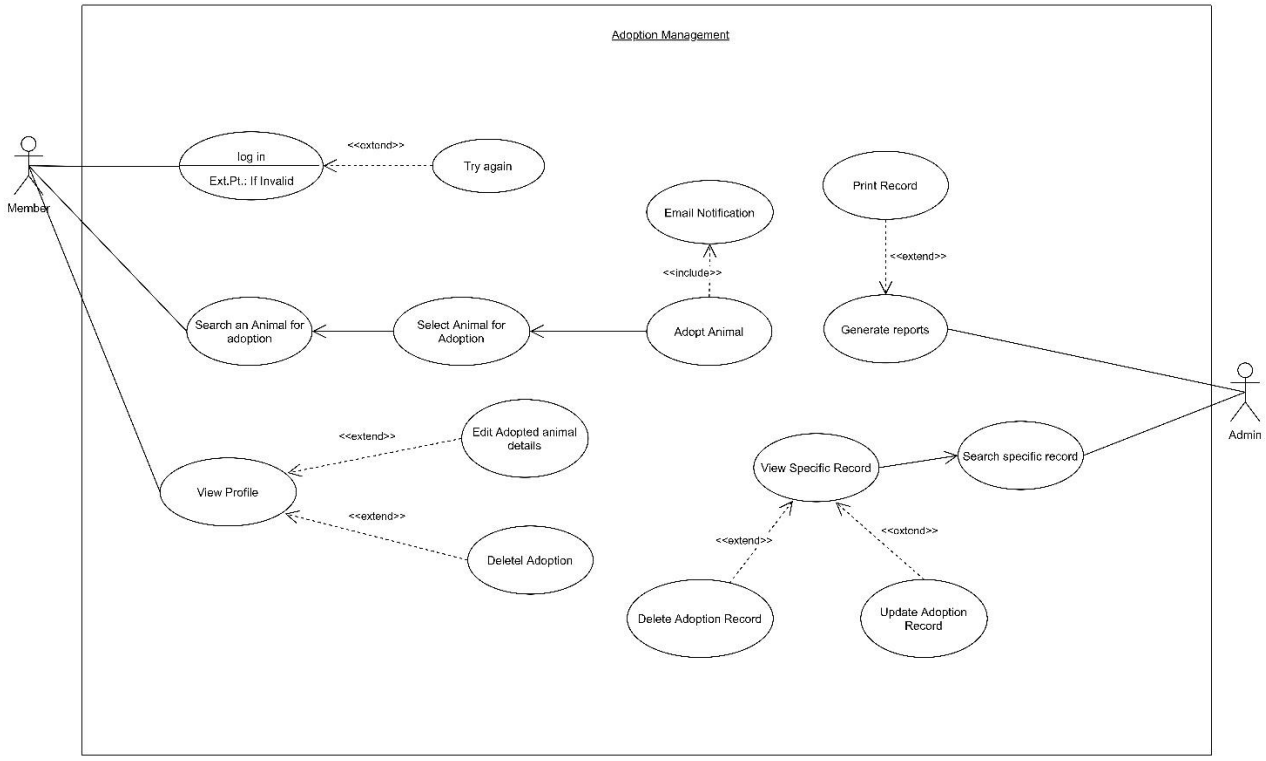


Figure 2.1.3: Animal Adoption Use Case Diagram

Employee management

Employee management is an integral part of Zoo Melaka System. It is mainly used by the administrators and Human resource management of the organization. It connects to almost all other system which needs employee data to fulfil their task. The system helps facilitate managing employee related information. Including changing salary, editing the details of the employee, adding new employee, searching an employee using their employee ID, deleting an employee when they leave the organization, printing all the records of the employee, printing the records of a specific employee, viewing specific records of an employee, viewing all their previous projects, generating employee ID added by their respective department they work for. This leads to an efficient management of the employees which helps reduce cost and increase the productivity of the employee.

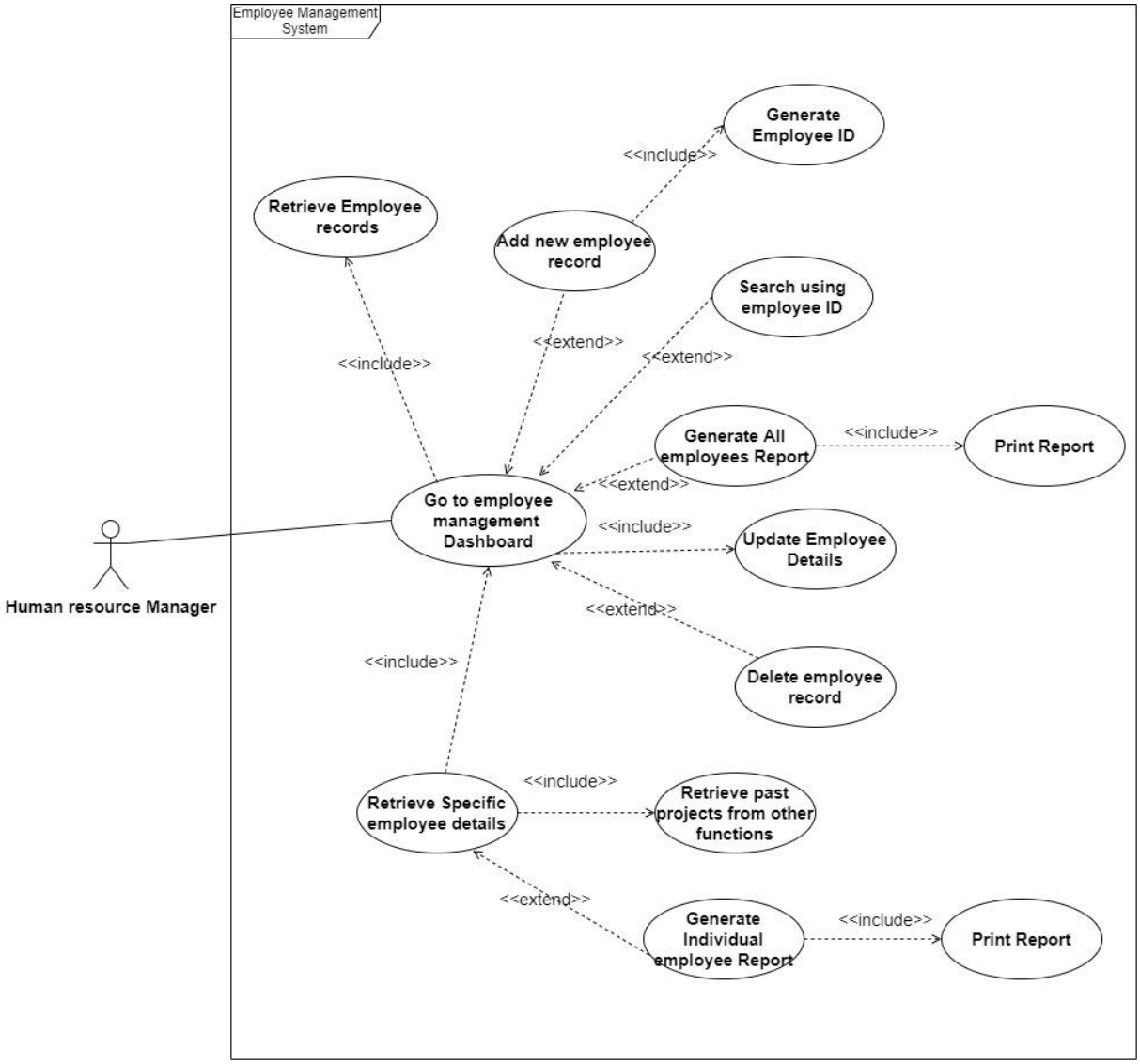


Figure 2.1.4 : Employee Management Use Case Diagram

Animal Management

The system handles the creation, retrieval, update, and deletion of animal records from a properly functional dashboard. The Head Zookeeper is capable of all such afore mentioned operations as well as searching the details pertaining to a specific animal based on its unique identification number. Create and Update functionalities are properly validated. The user can generate reports per animal or for the entire collection of animals at the zoo. Furthermore, the authorized personnel can view the medical records of each, and every animal as required. This functionality also offers the user to view the adoptability status of any animal along with their respective details.

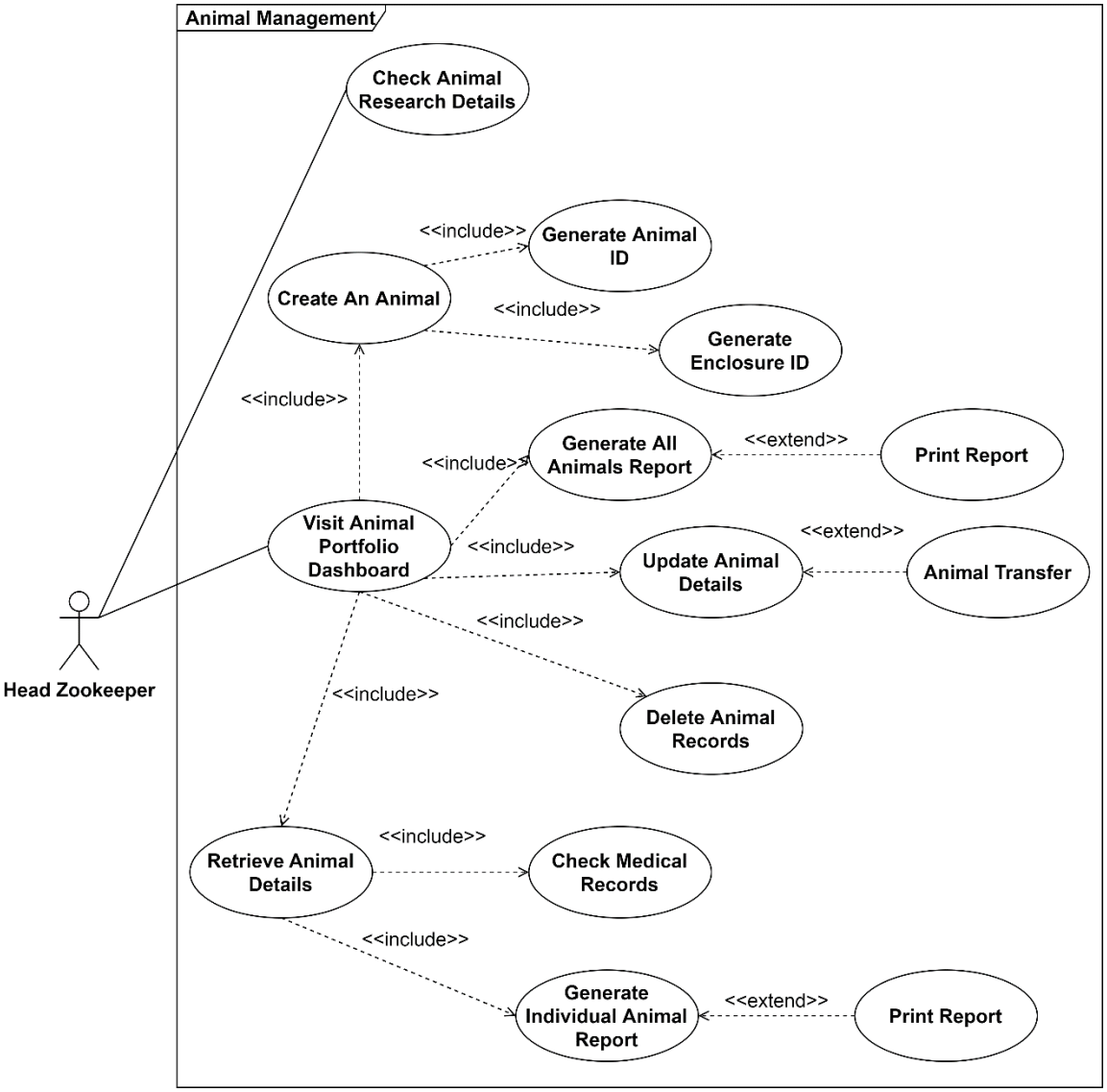


Figure 2.1.5 : Animal Management Use Case Diagram

Project Management

Project management does a very important role in the Zoo Management System. Organizing of new projects and manipulating existing projects will done by this project management function. Any kind of construction, fund raising projects, organizing events and animal conservation projects are managed by project management. In project management function every project has a project ID, project name and project title, description, supervisor and working team. Administrator can search any project and edit these project details. To access these data, employees must log in using their user credentials. Project management function mostly used by zoo administration. Create, delete, and update functions only works with administrative privileges. When creating a new project, assigning working team and supervisor is compulsory and these parts relates to member management and employee management.

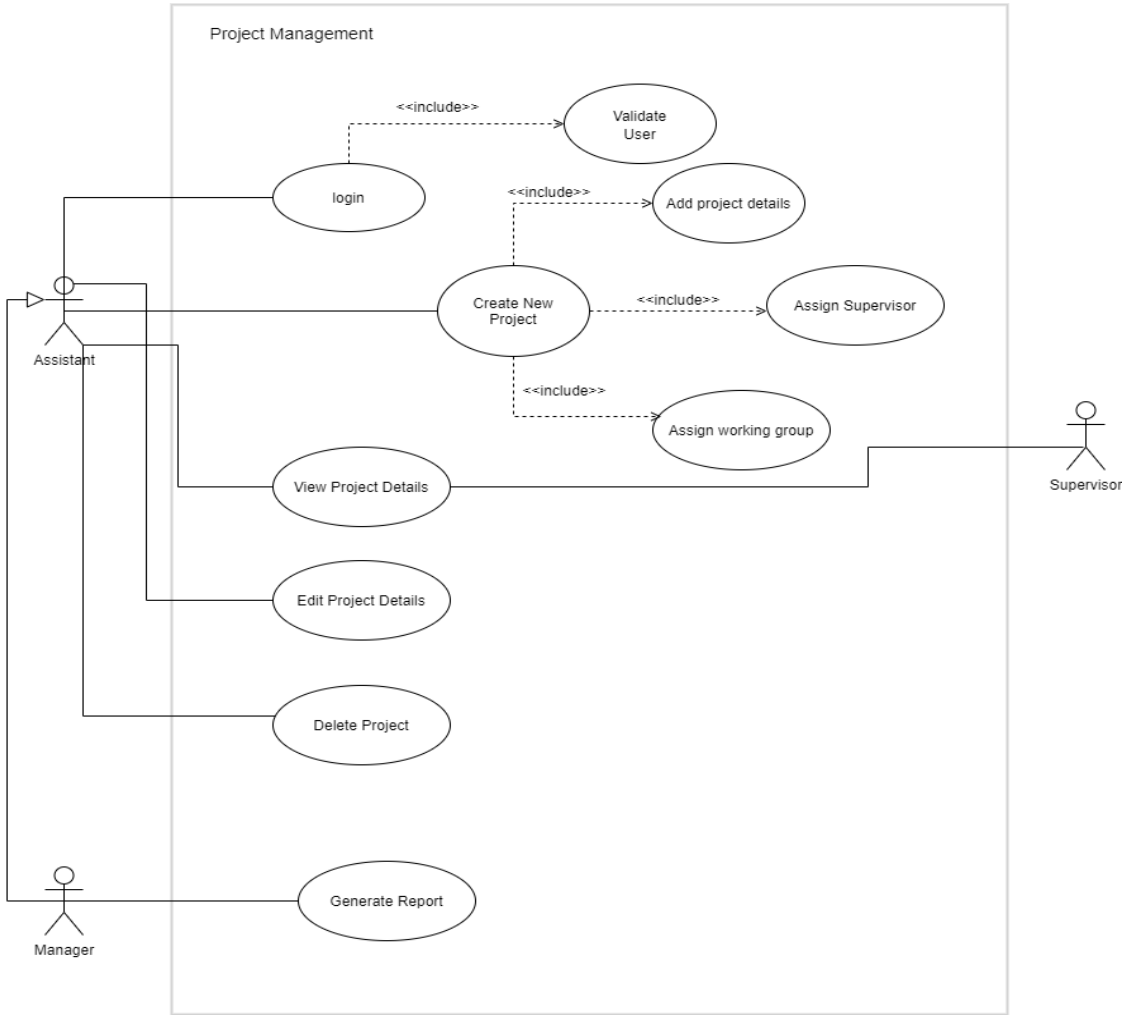


Figure 2.1.6: Project Management Use Case Diagram

Medical Records Handling

Medical report handling consists of essential work-related and animal medical records that are handled by veterinarians and zookeepers. Medical records contents all the surgical and medical records operating by the veterinarians in Zoo Melaka. Also, the administration, veterinarians and zookeepers can have access to this function. It helps the administration to check the veterinarian who did the surgery if anything goes wrong and to track the medical records. A veterinarian and admin panel can add, edit, read, and delete the medical records. Also, there are information such as animal ID, Injection ID, Veterinarian ID, Zookeeper ID and the surgery info. Veterinarians and Zookeepers must select their ID from the drop-down list that comes from the Employee Database and Animal ID from the Animal Management database. Administration and Veterinarian can get a full report on every record by generating it to a PDF.

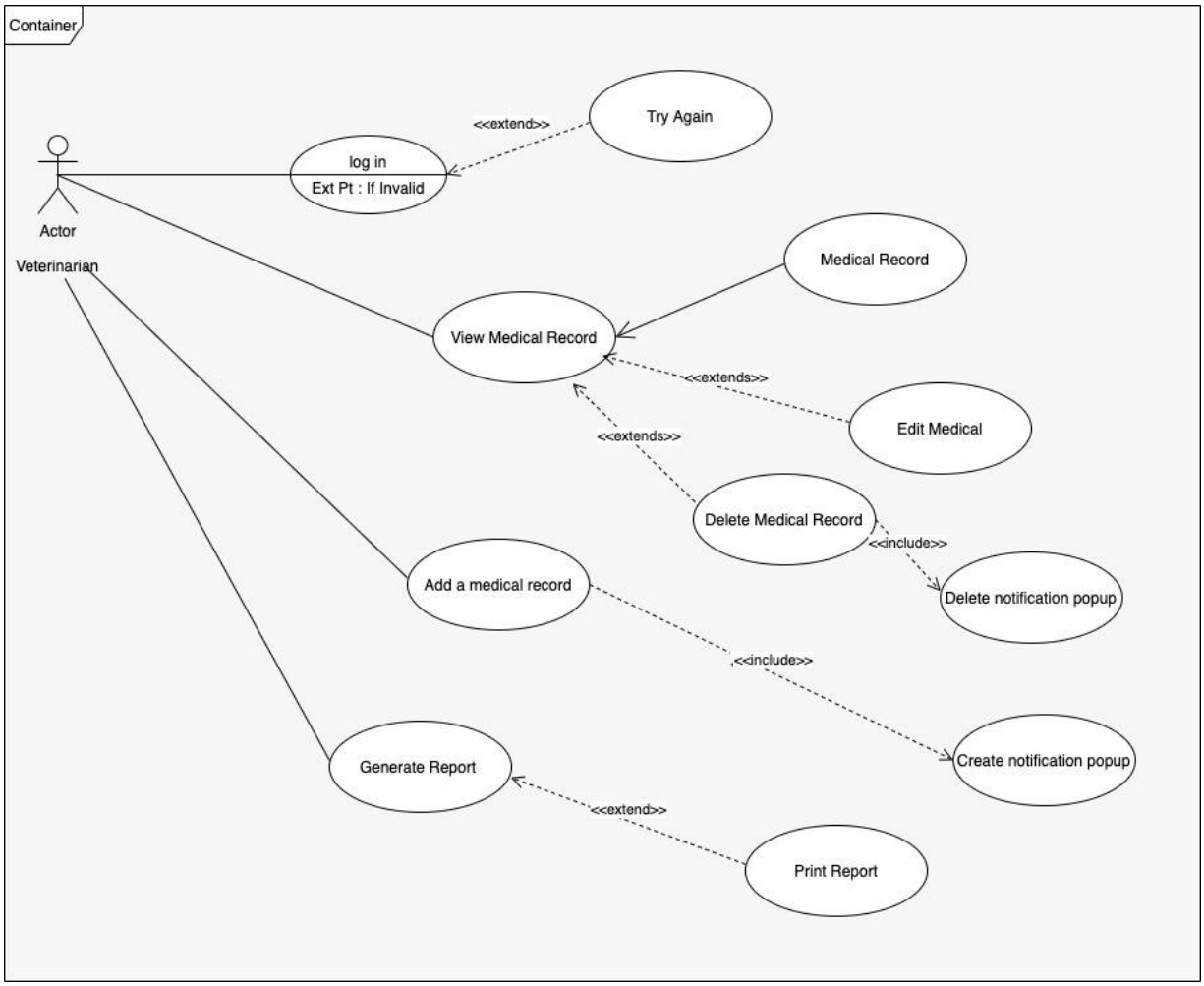


Figure 2.1.7: Medical Records Handling Use Case Diagram

Research Document Handling

Research documents Management is consistent of important research information about research and scientists. It helps the scientists to track reports, research documents and to maintain their information up to date with ease. This allows the scientists to log into the system successfully and then manage the research information. He can add new research information to the system, modify existing information, or remove any research records, information from the system. scientists can select their name ,add the research category, research started date, research ended date and all the research data, experimental data. Animal id also added when submitting new research. Animal portfolio and employee management functions are being integrated with research documents managing function. Scientists can search research records according to the category. Also, the scientists and customers can view scientists' information by clicking on scientists name list on the research dashboard. Each animal's data used for each research can be viewed by clicking on animal ID in the table. Research report can be for specific research record. If the scientist wants to get a full report on every record in the table a report can be generated. Once the customer login to the system he can click on research handling and get access to view the research documents. He can easily view the animal details of each research and scientists' information too. If the customer wants to collaborate, he can ask for a collaboration.so the customer can simply add a collaboration. scientists can view the collaboration details once its added.

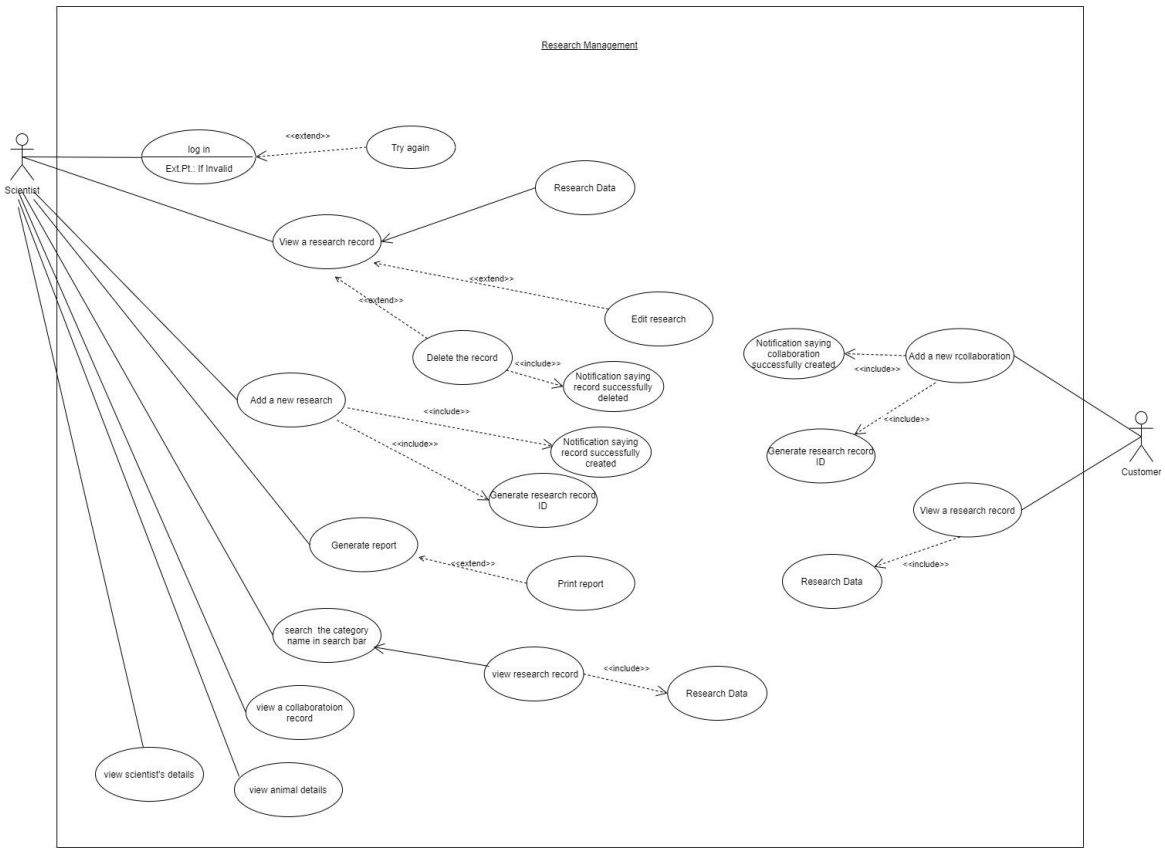


Figure 2.1.8 : Research Document Handling Use Case Diagram

2.1.1 Activity Diagrams

Customer Service Management

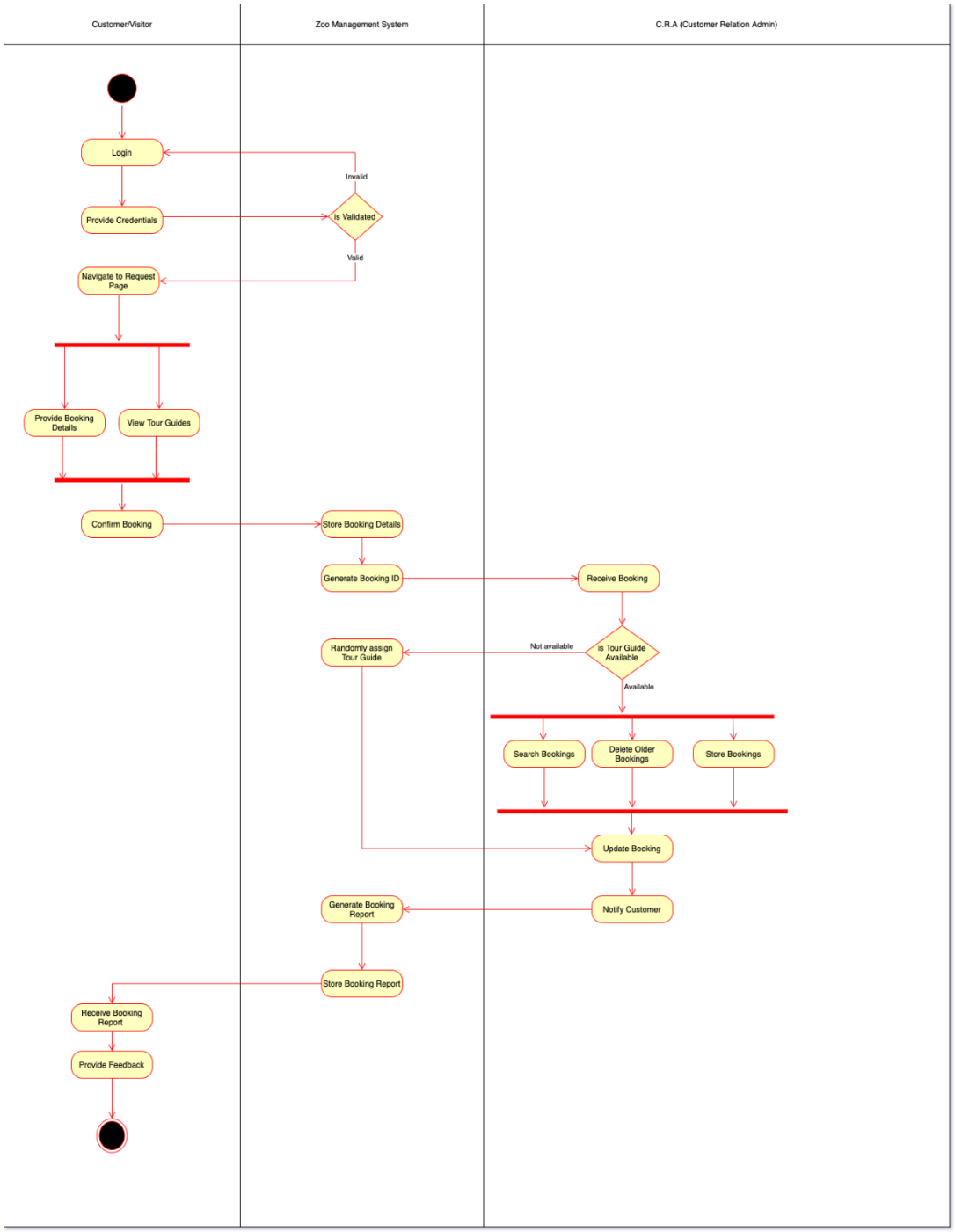


Figure 2.1.1.1: Customer Service Management Activity Diagram

Member/Visitor Management

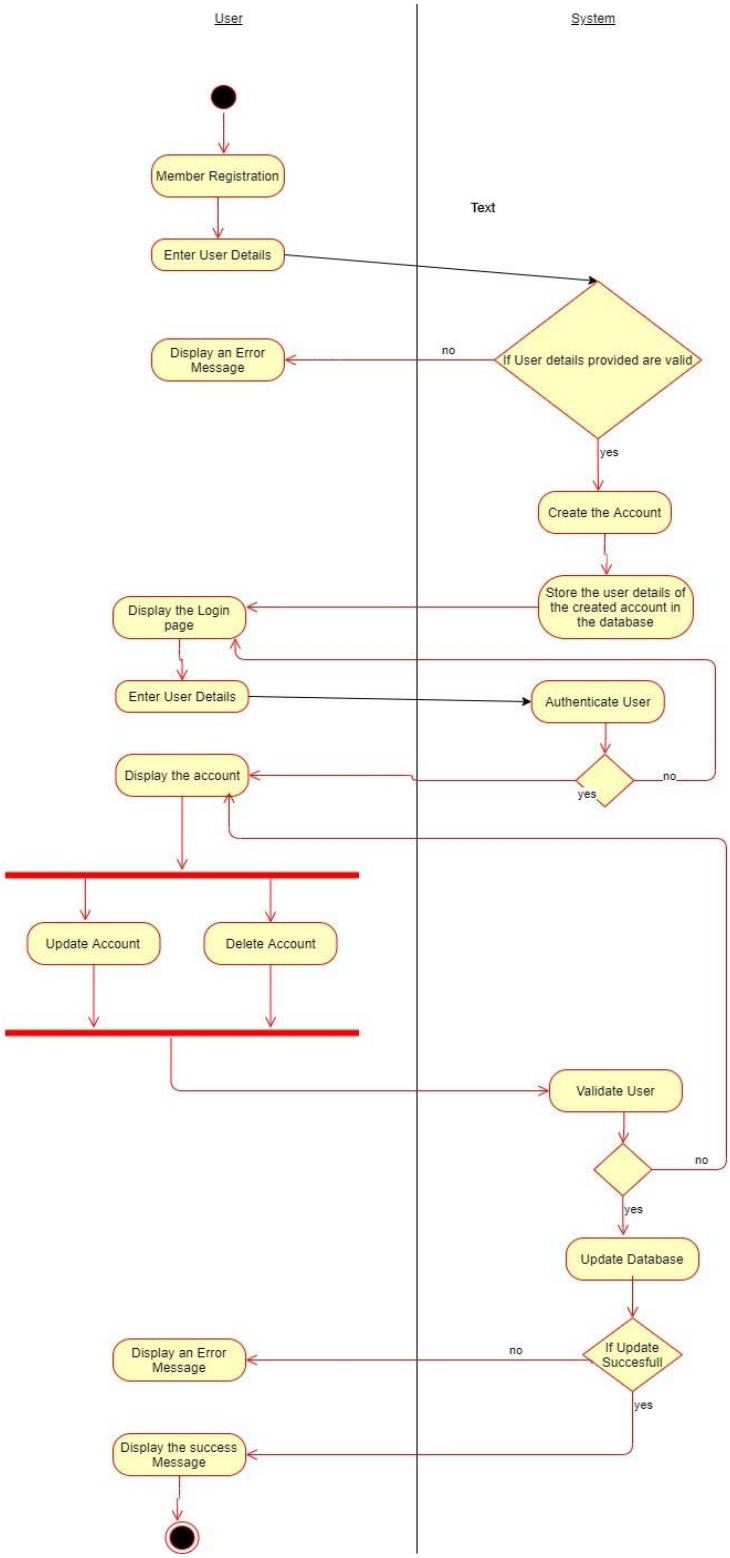


Figure 2.1.1.2: Member / Visitor Management

Animal Adoption

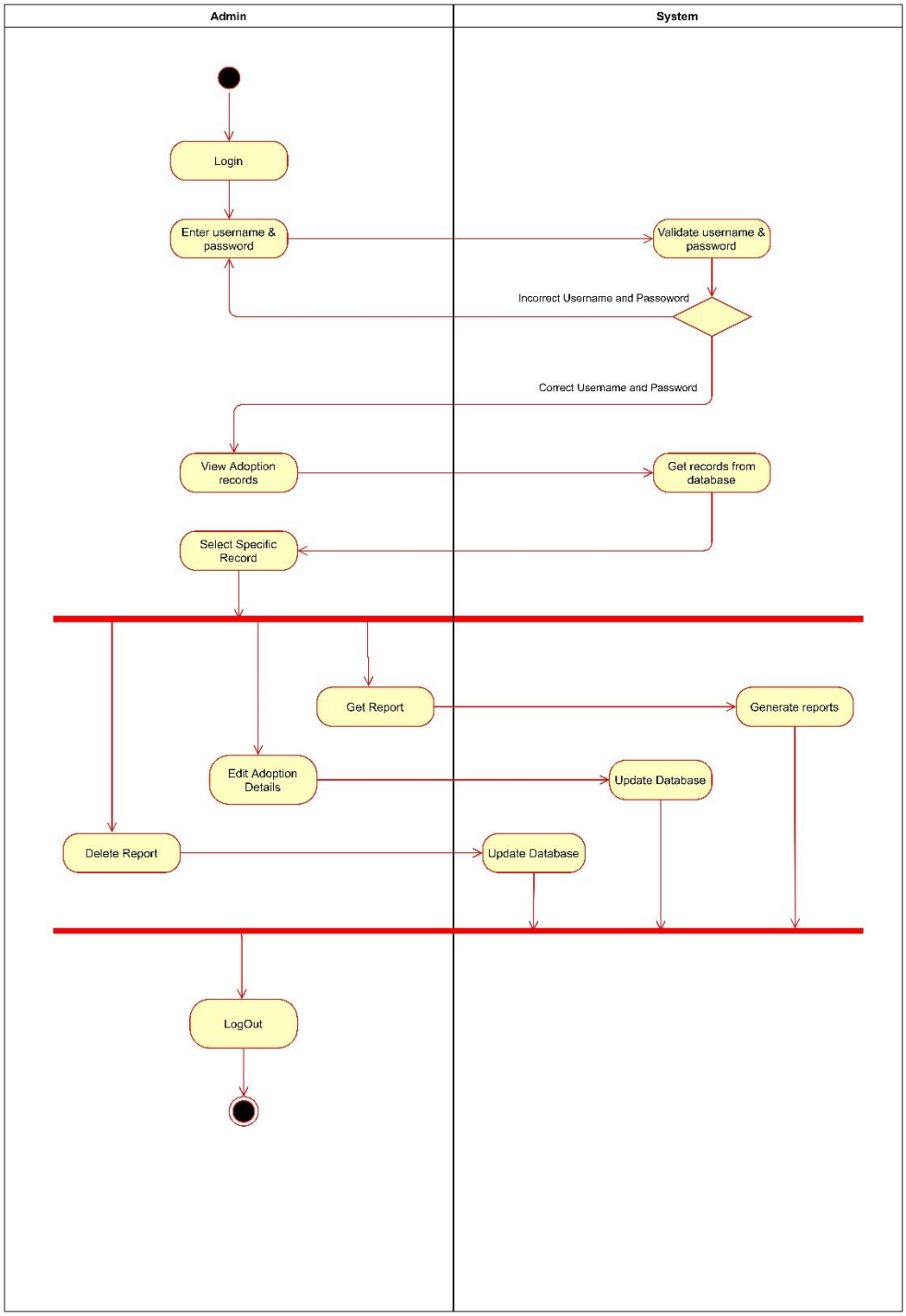


Figure 2.1.1.3: Animal Adoption Activity Diagram 1

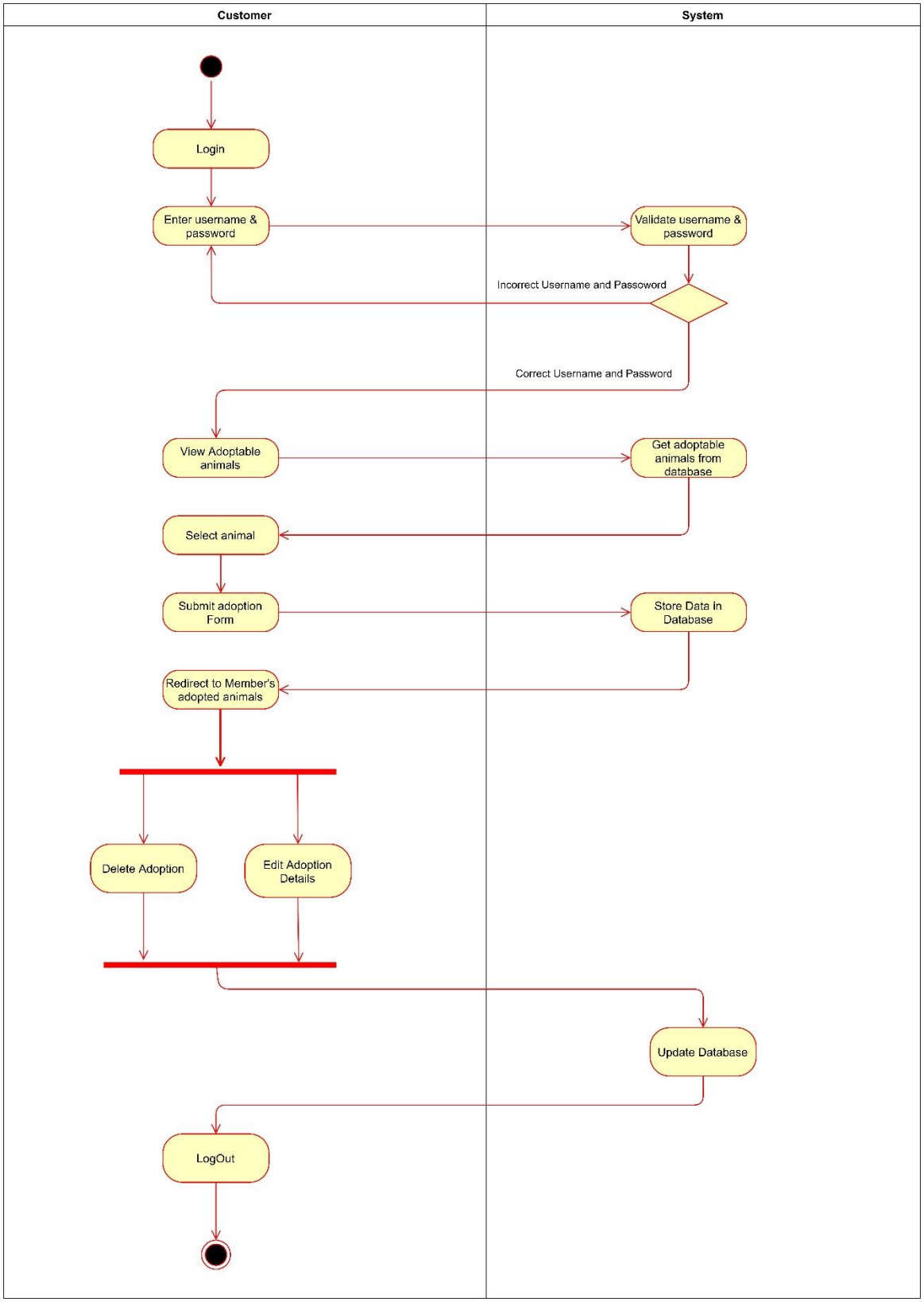


Figure 2.1.1.4: Animal Adoption Activity Diagram 2

Animal Management

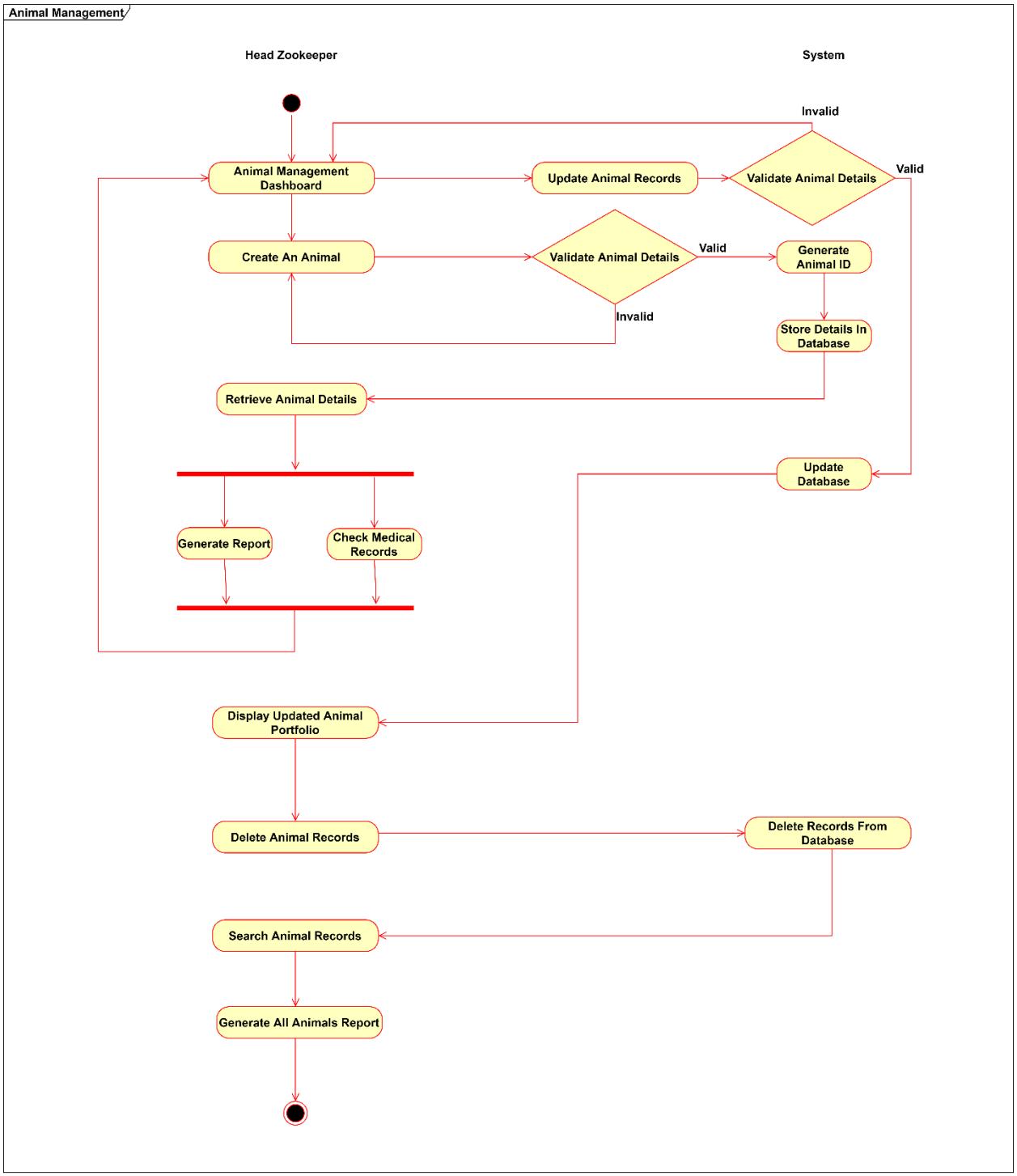


Figure 2.1.1.5: Animal Management Activity Diagram

Project Management

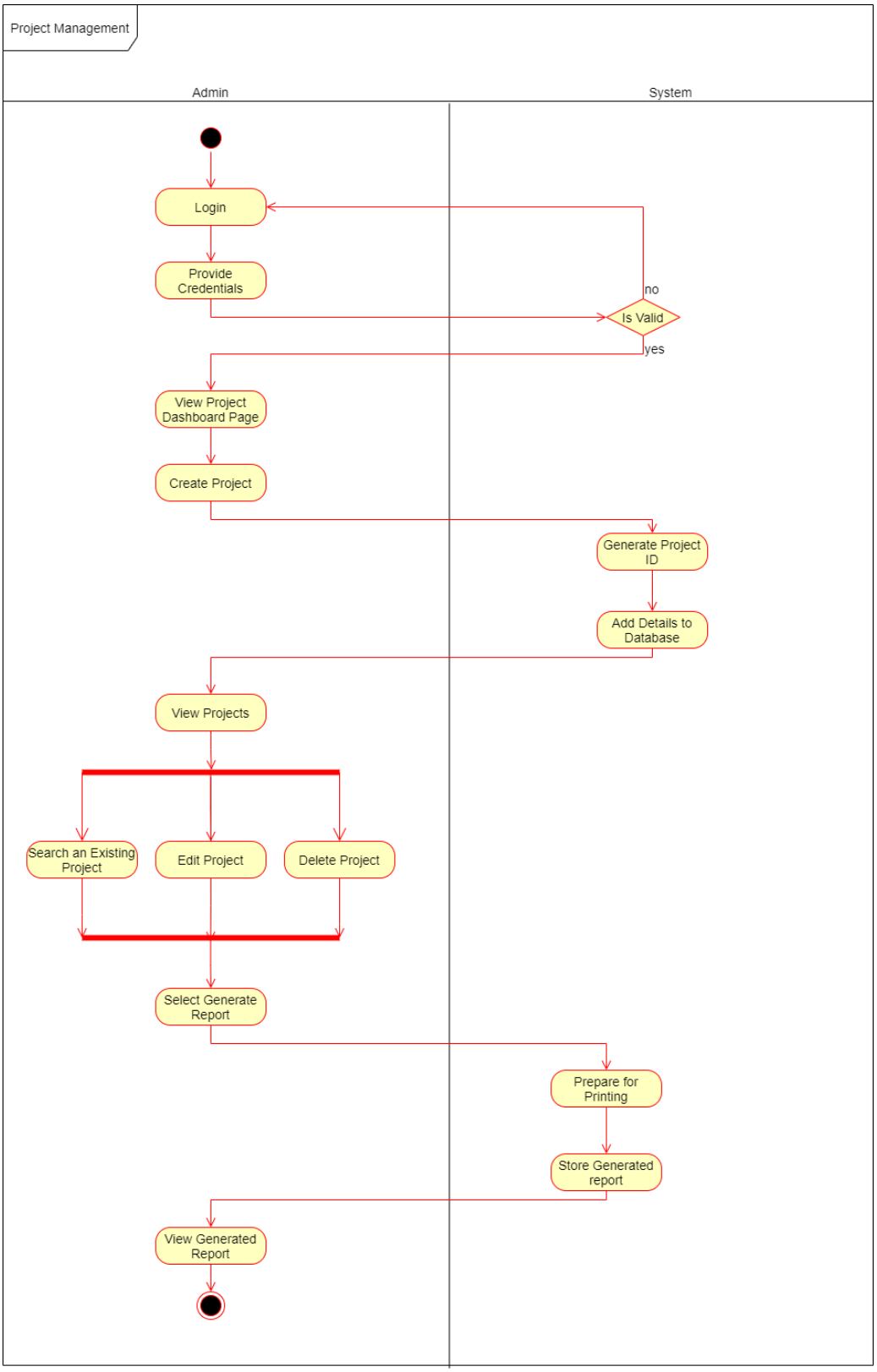


Figure 2.1.1.6: Project Management Activity Diagram

Employee Management

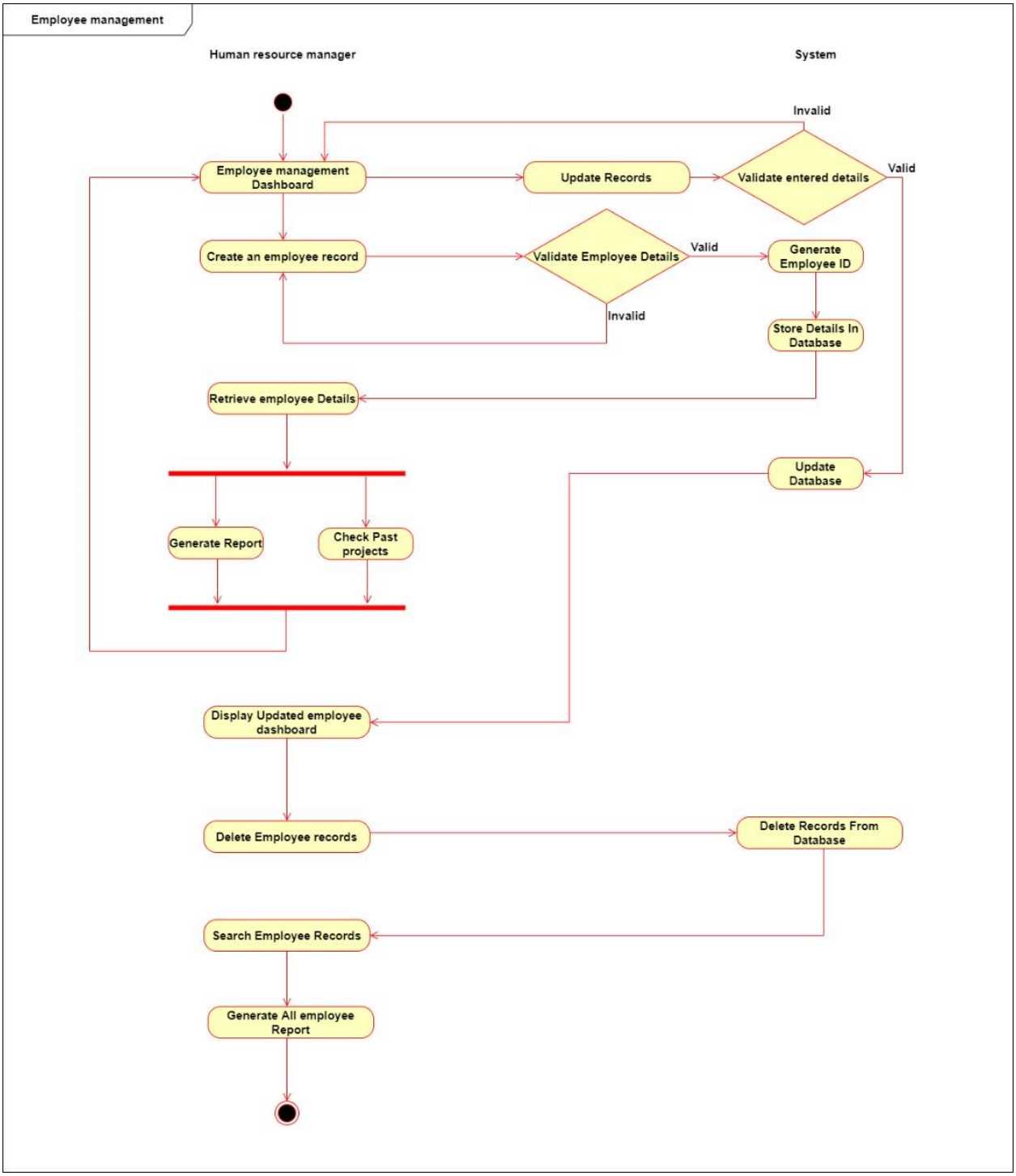


Figure 2.1.1.7: Employee Management Activity Diagram

Medical Records Handling

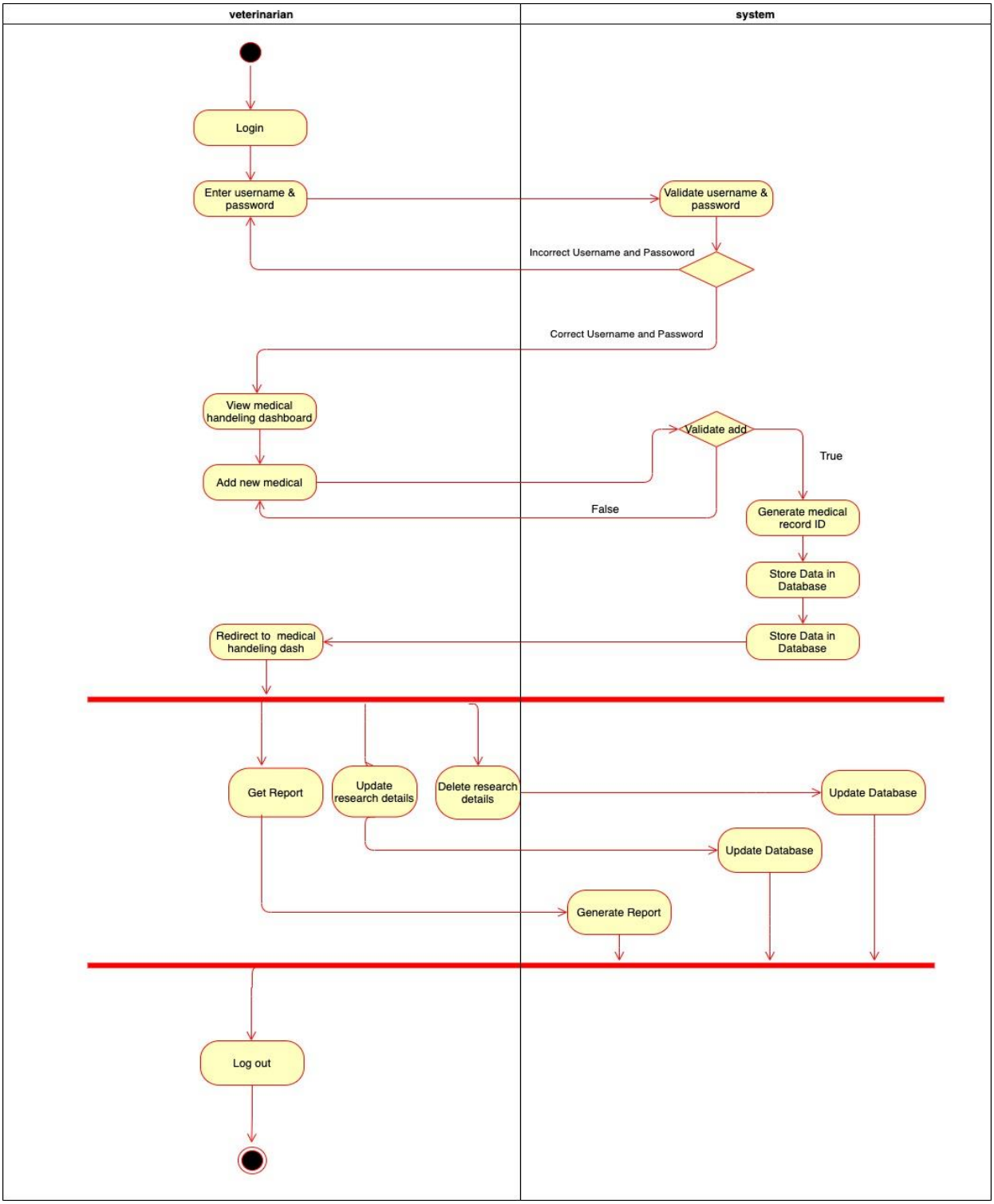


Figure 2.1.1.8 : Medical Records Handling Activity Diagram

Research documents handling

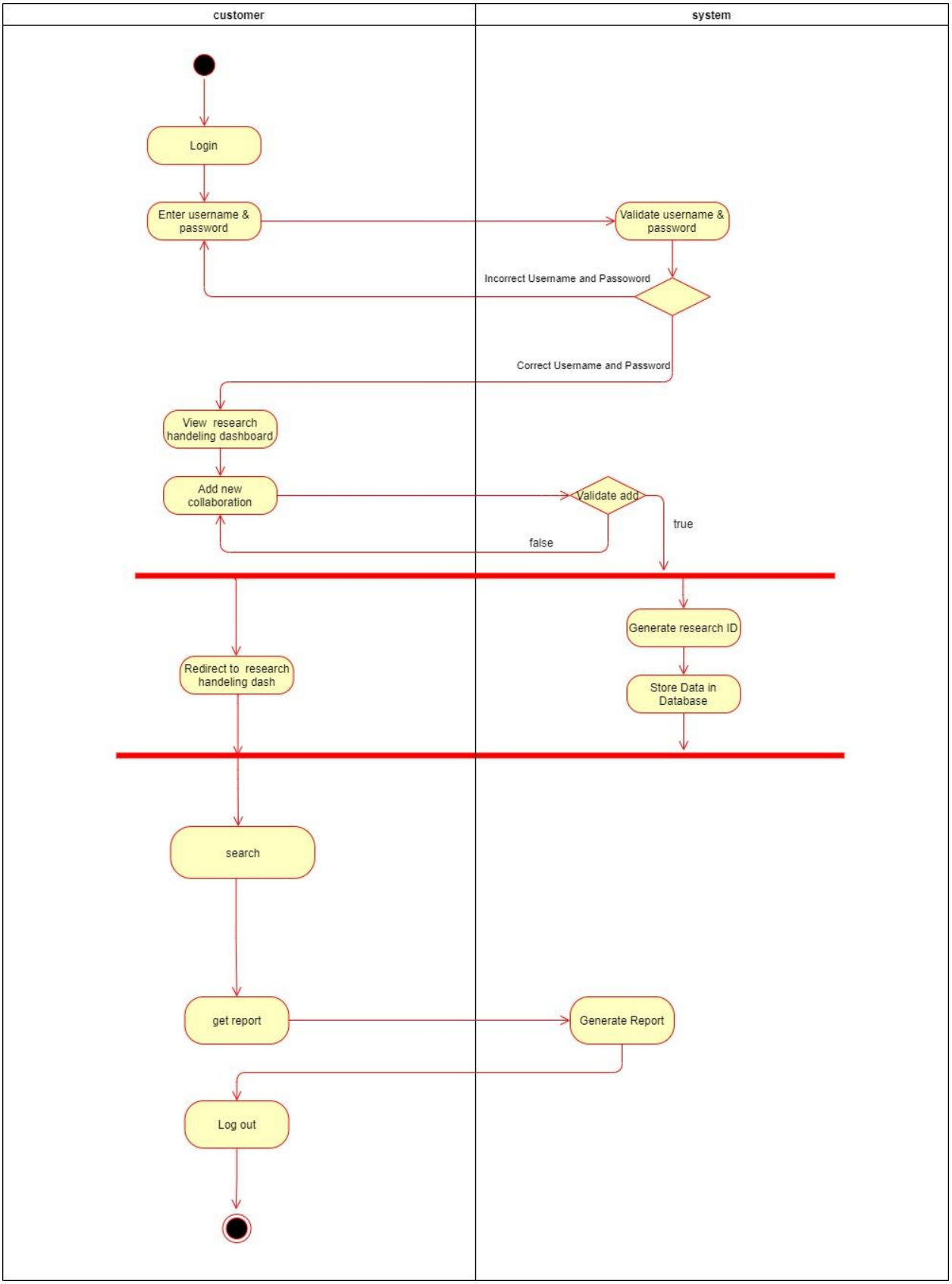


Figure 2.1.1.9 : Research Management Activity Diagram 1

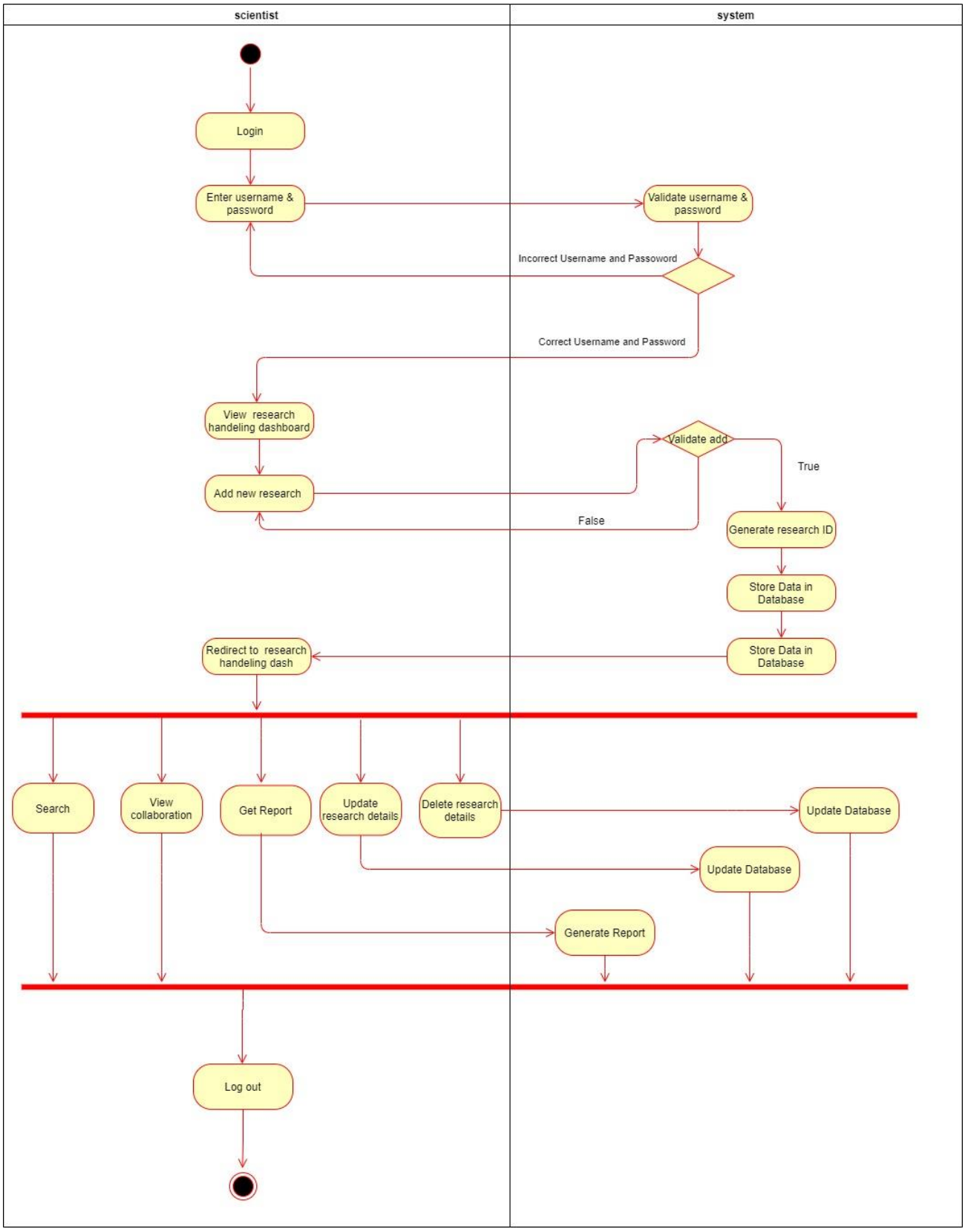


Figure 2.1.1.10: Research Management Activity Diagram 2

2.2 Design

2.2.1 ER Diagram

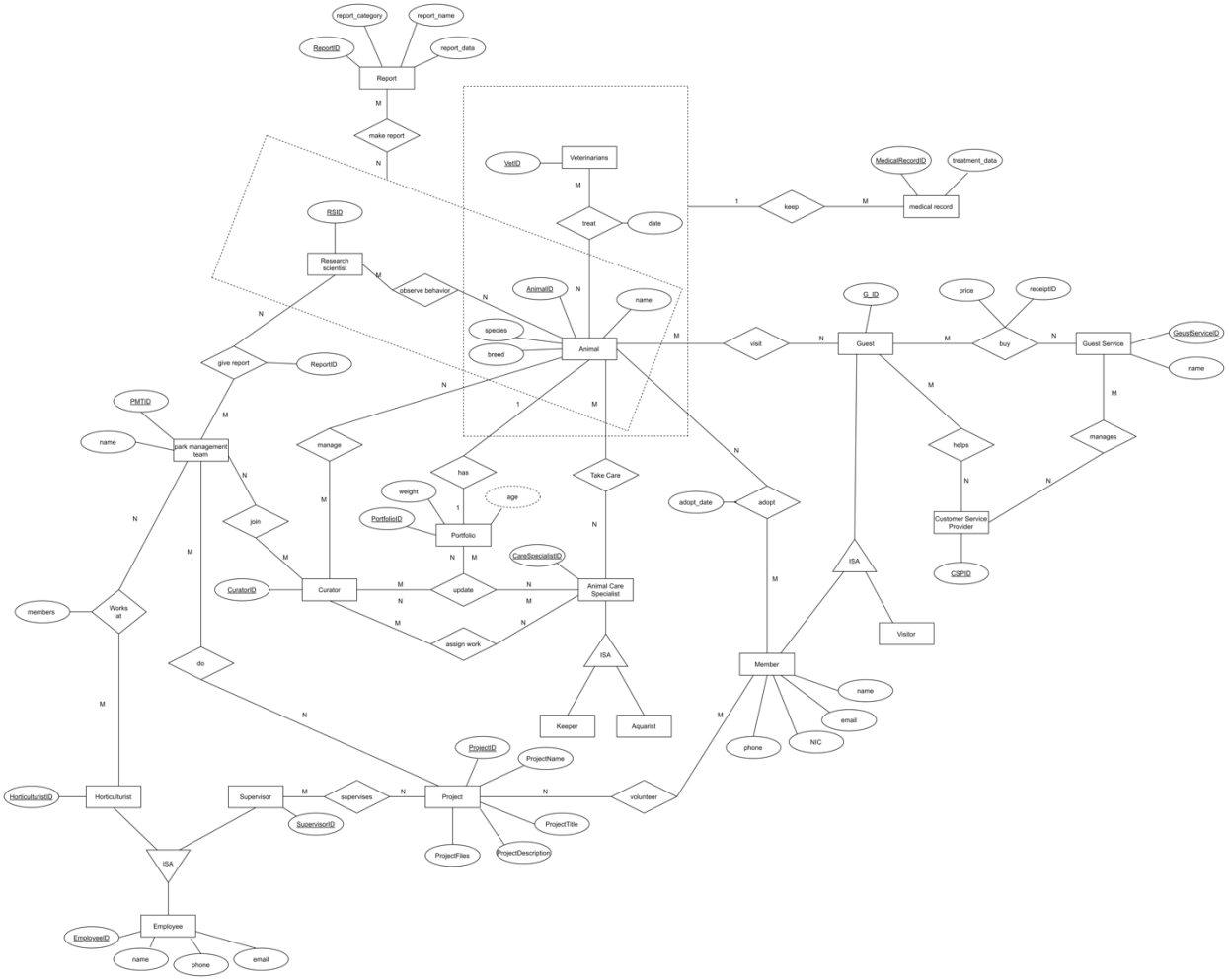


Figure 2.2.1.1 : Zoo Melaka E.R Diagram

2.2.2 Sequence Diagram

Login Sequence Diagram

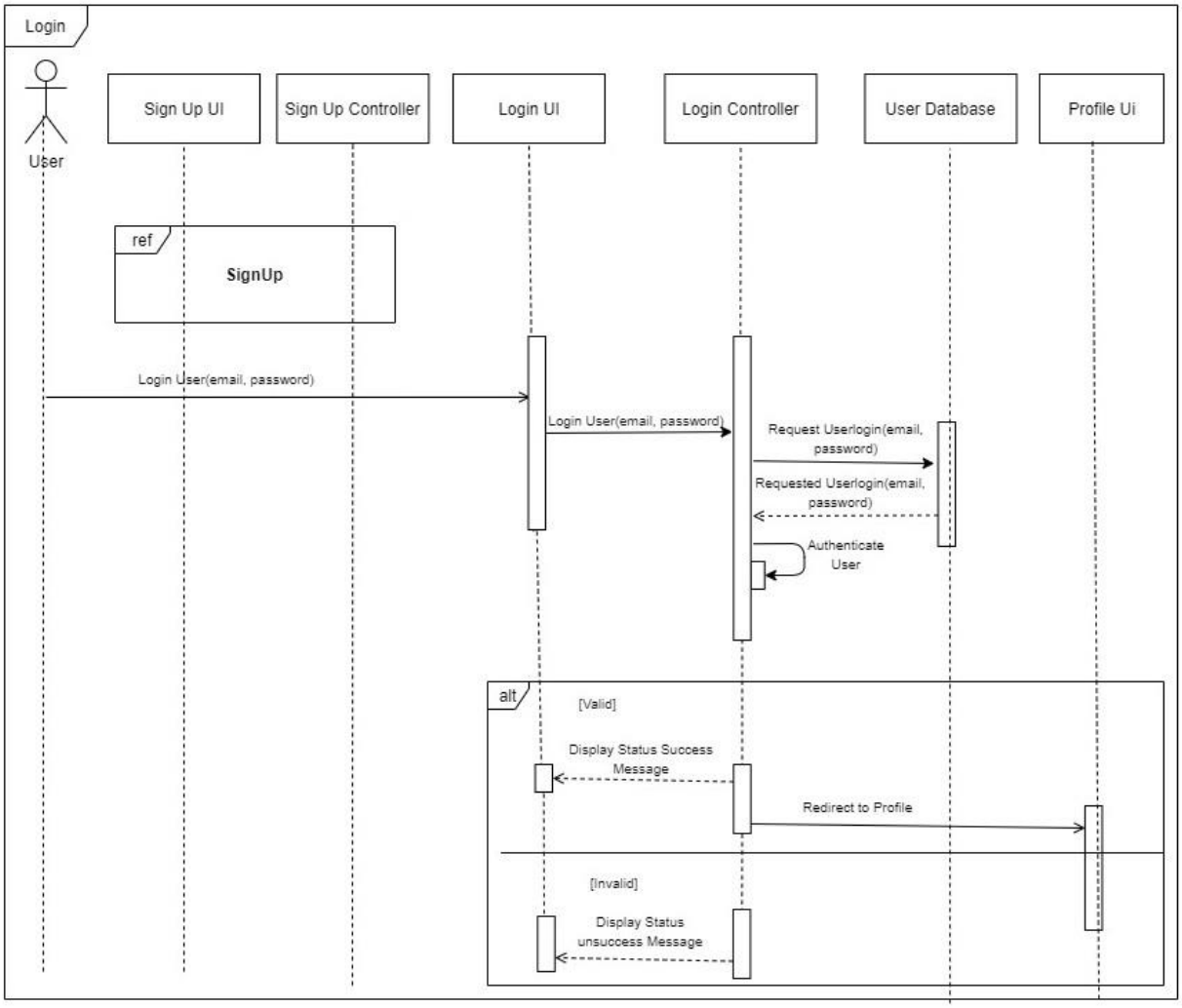


Figure 2.2.2.1 : Login Sequence Diagram

Sign up Sequence Diagram

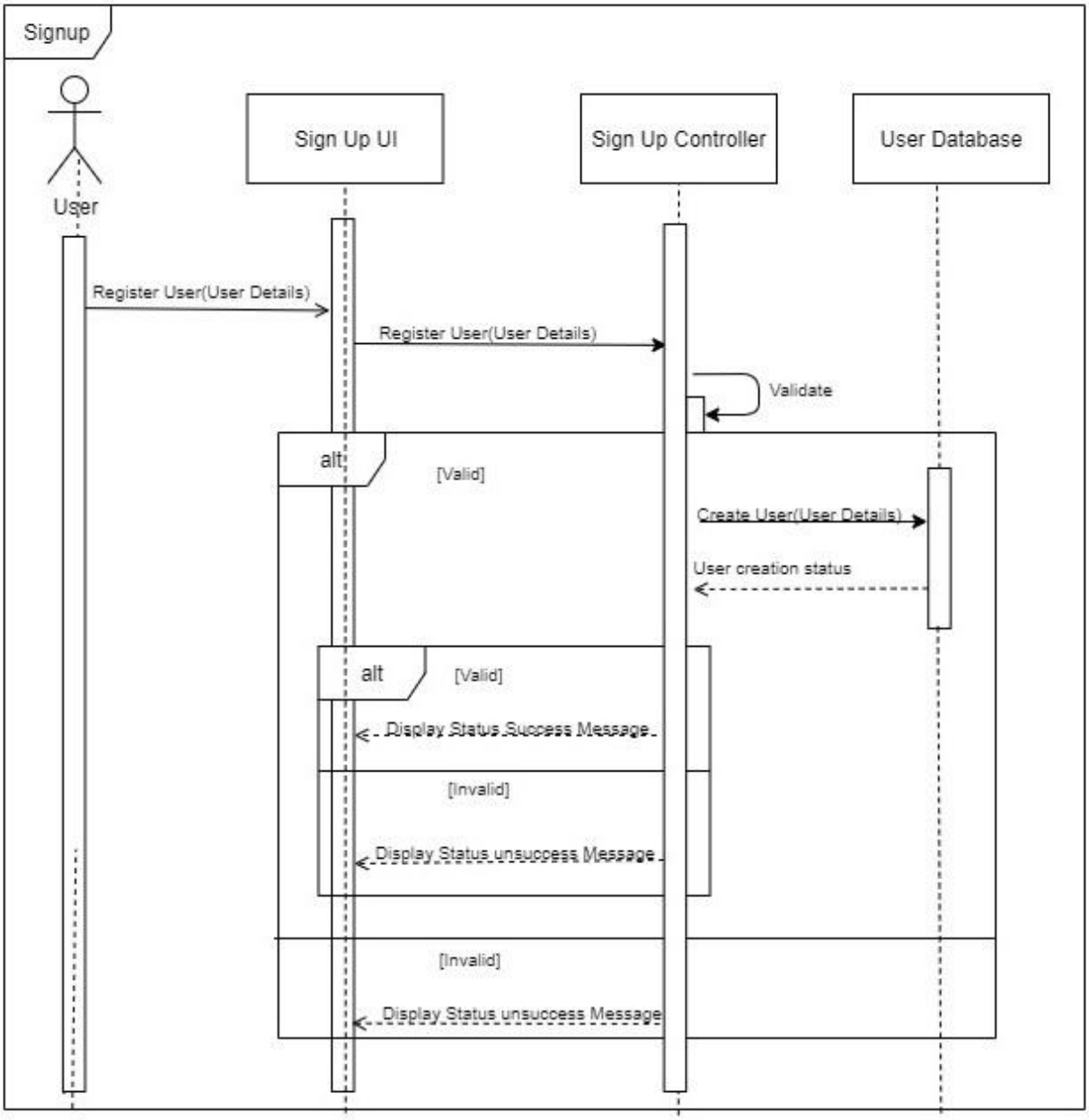


Figure 2.2.2.2 : Sign Up Sequence Diagram

Customer Service Management

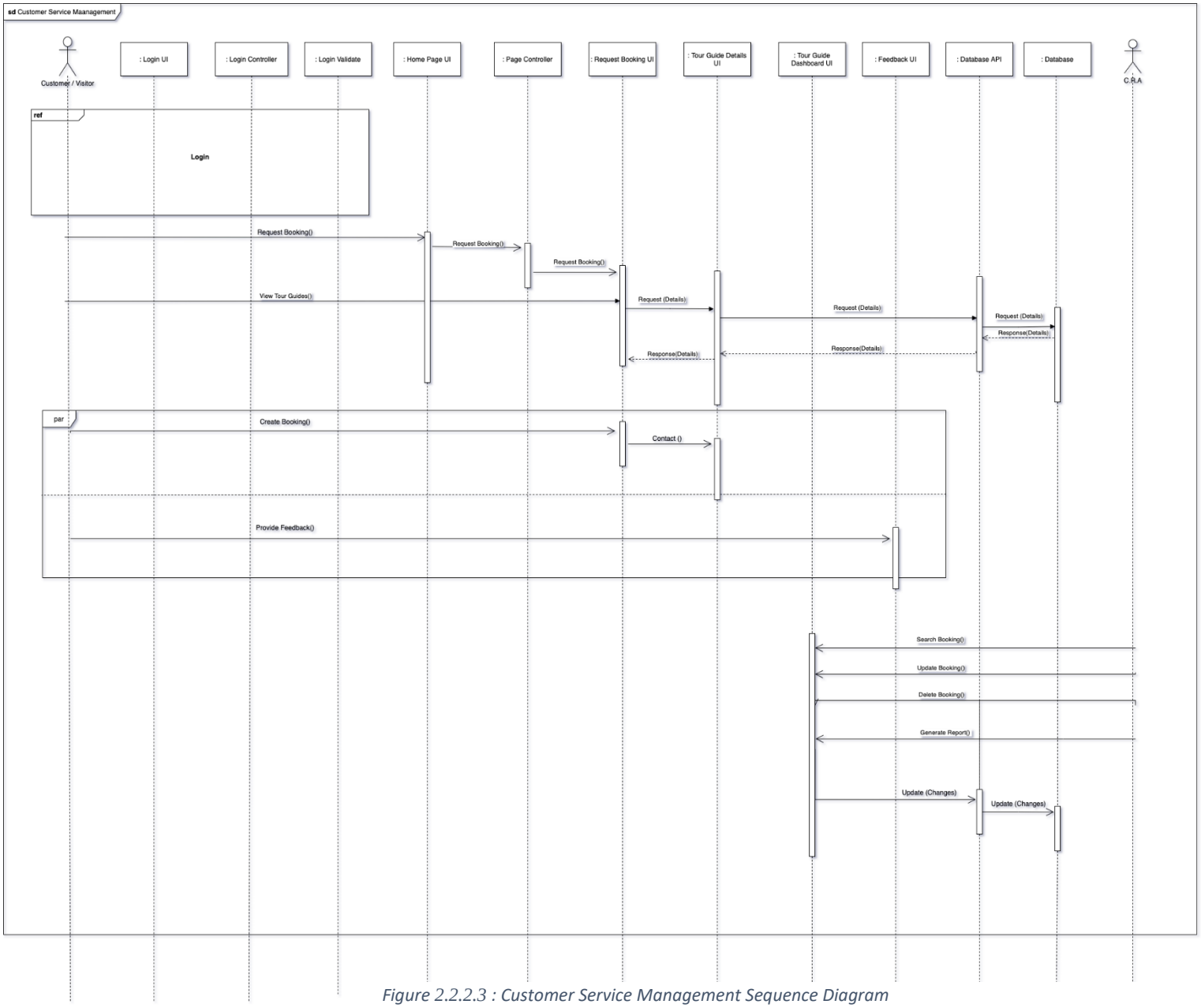


Figure 2.2.2.3 : Customer Service Management Sequence Diagram

Member management

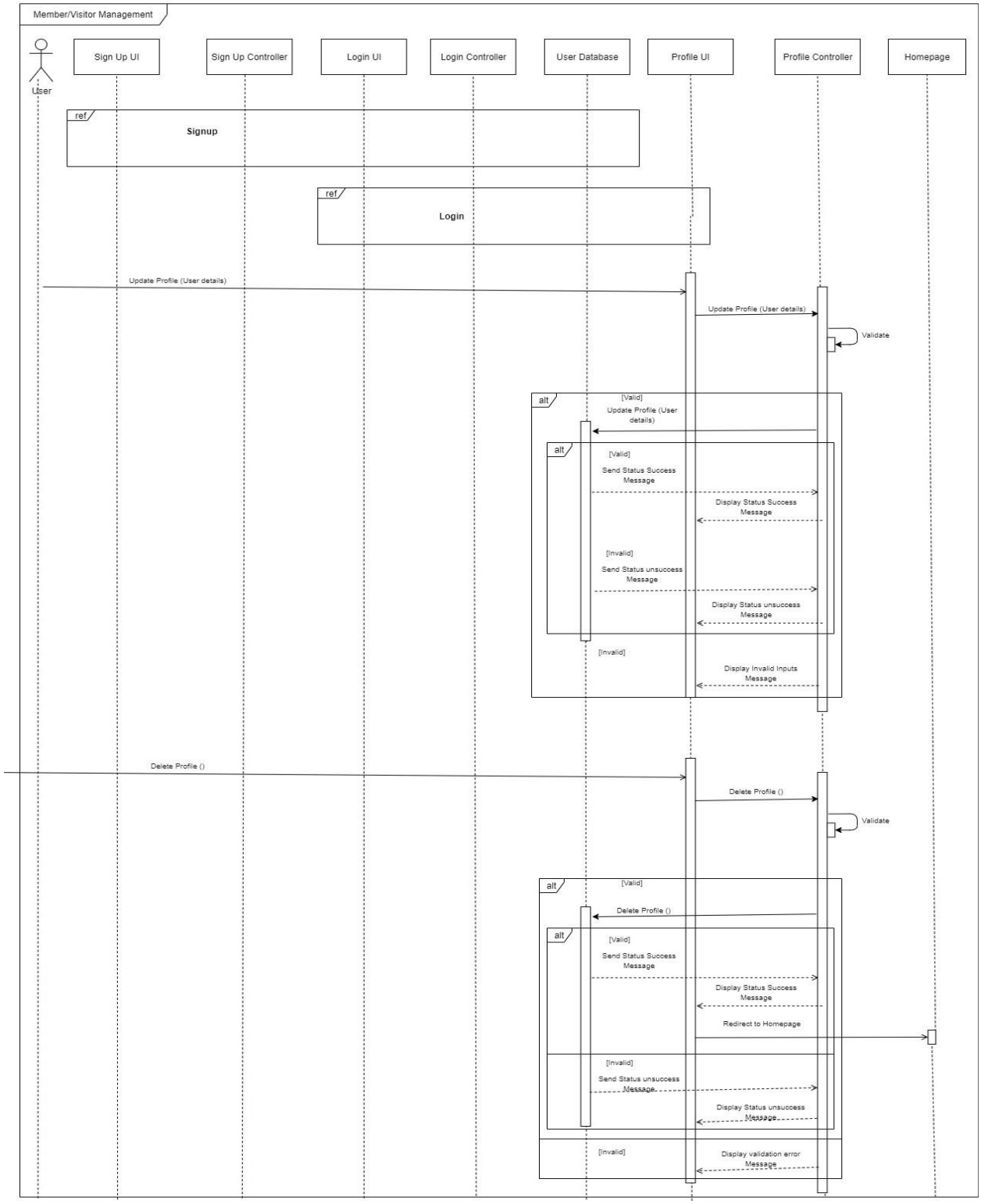


Figure 2.2.2.4: Member / Visitor Sequence Diagram

Animal adoption

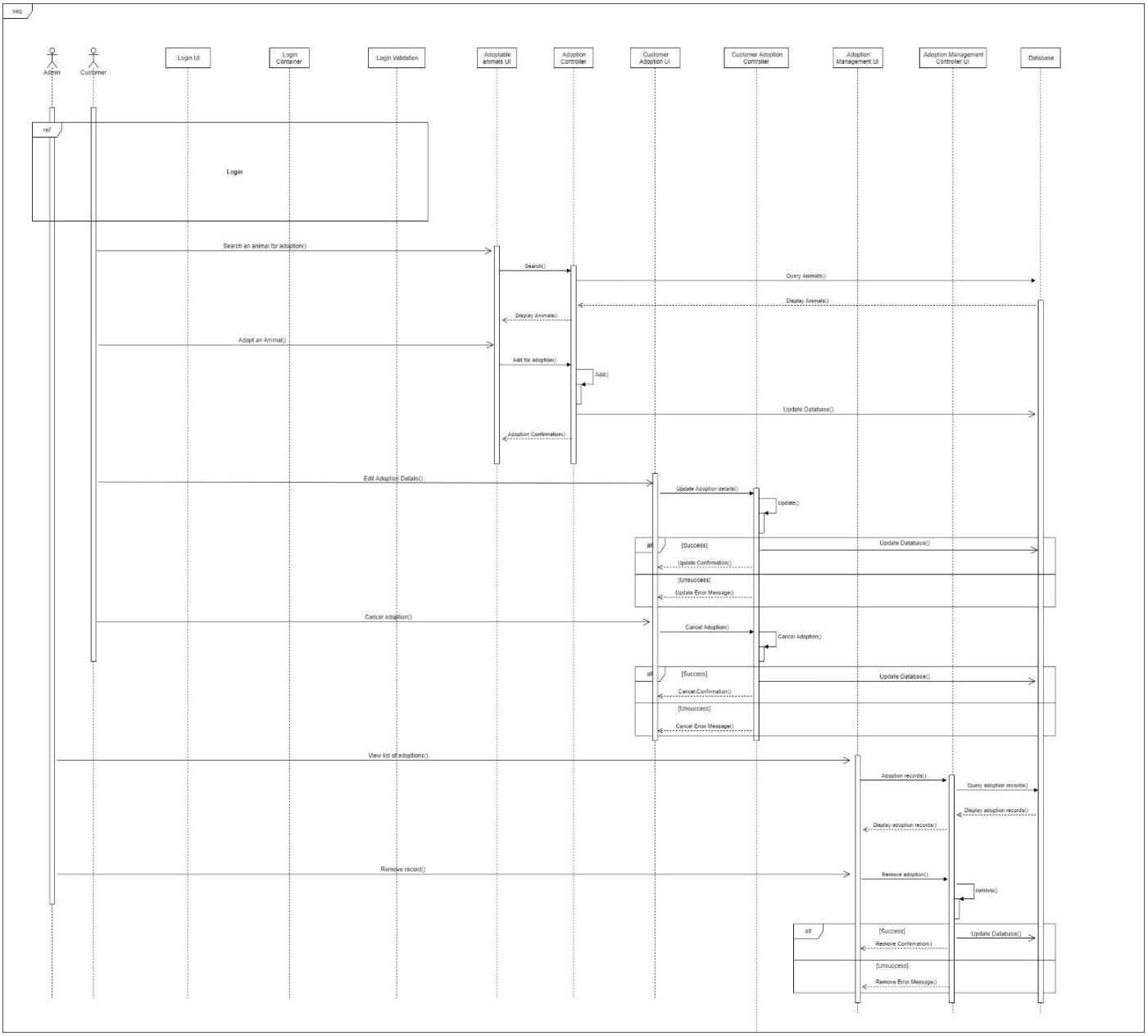


Figure 2.2.2.5: Animal Adoption Sequence Diagram

Employee management

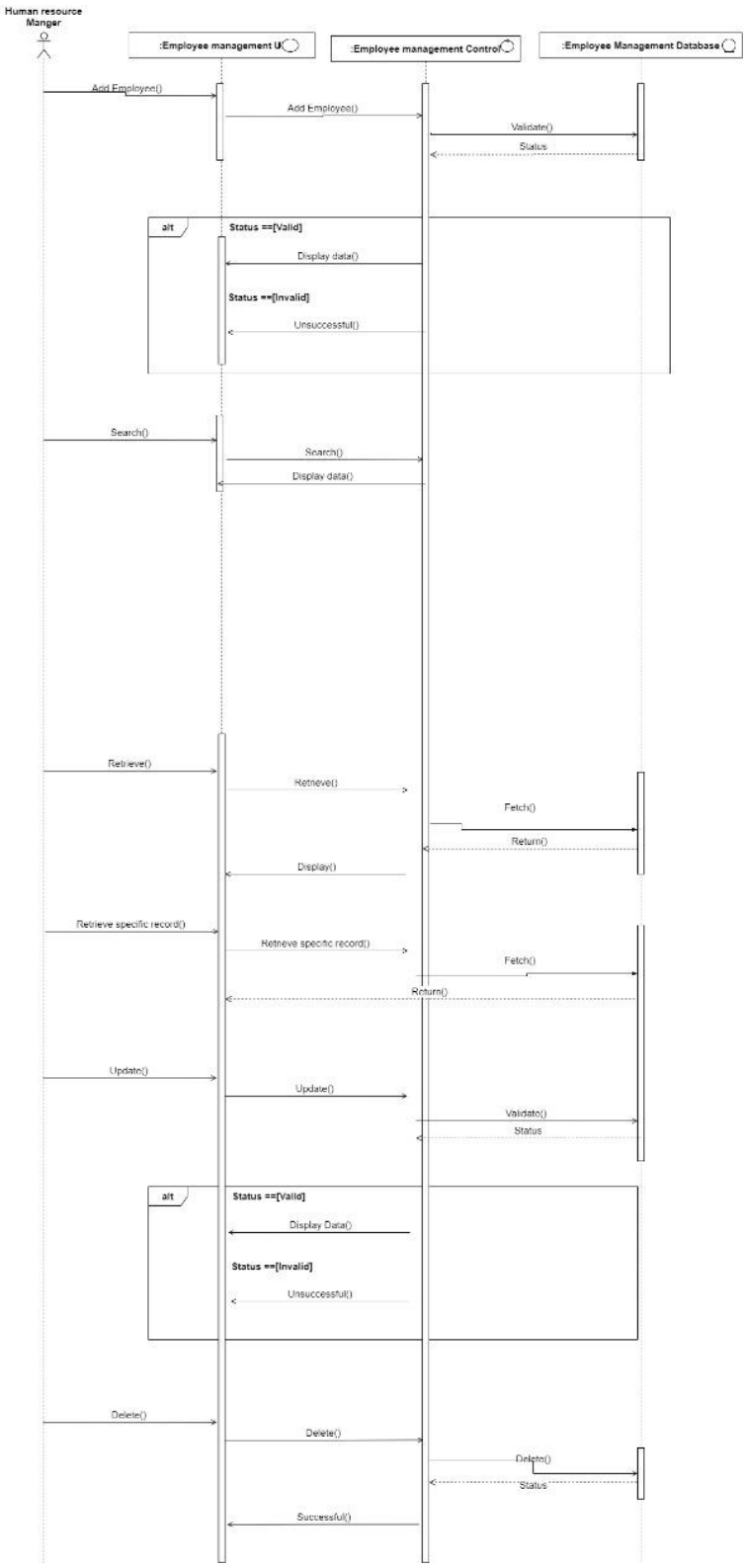


Figure 2.2.2.6: Employee Management Sequence Diagram

Animal management

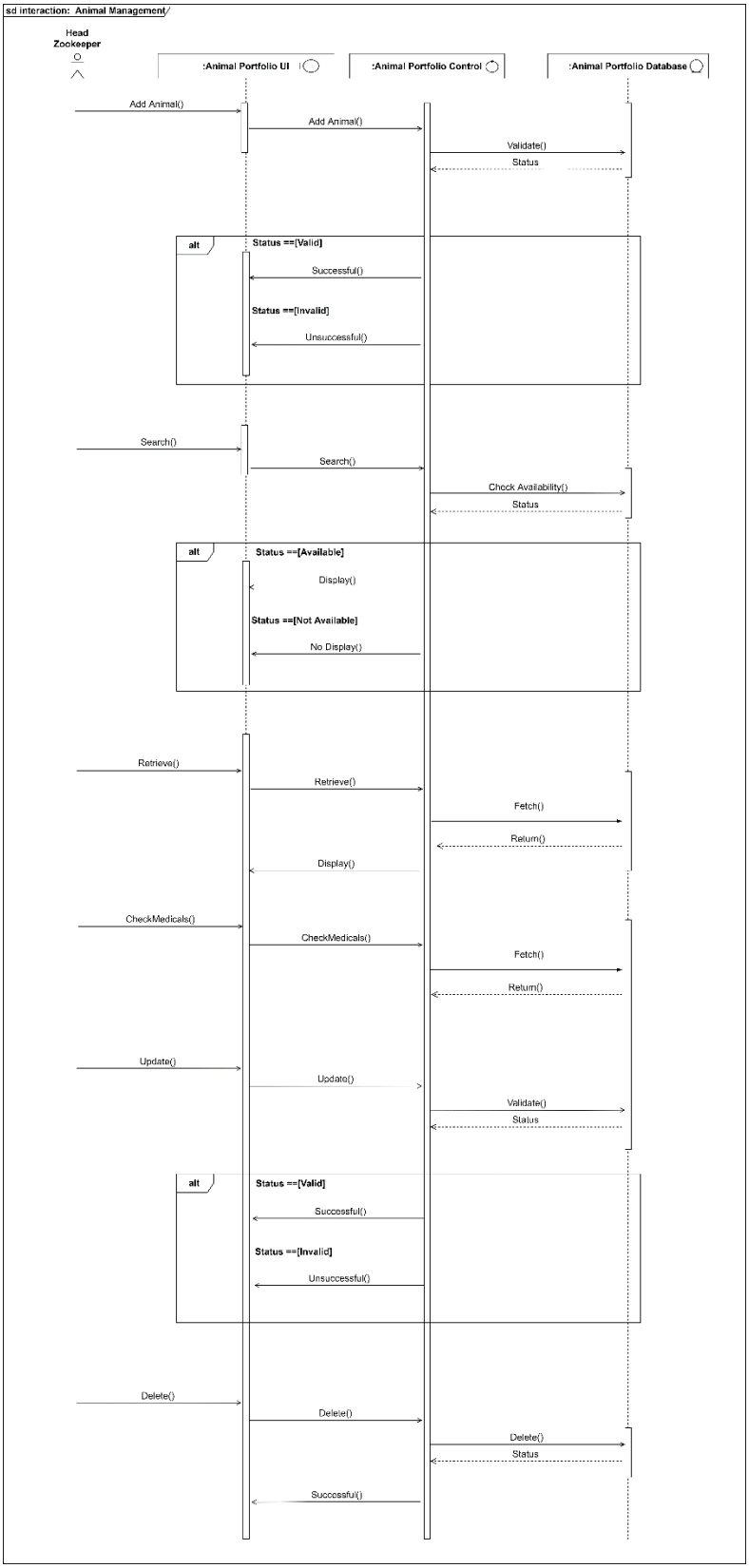


Figure 2.2.2.7: Animal Management Sequence Diagram

Project Management

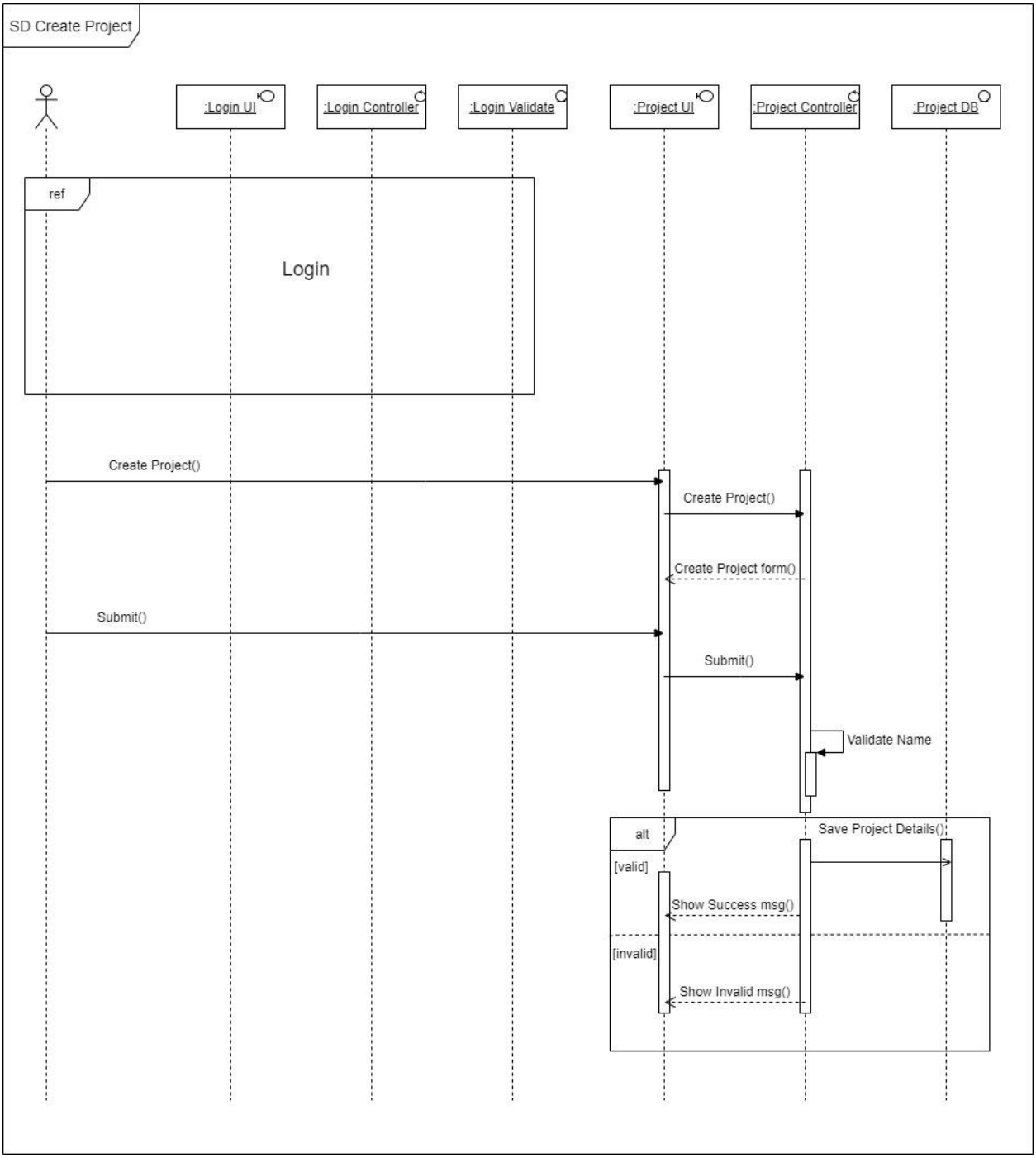


Figure 2.2.2.8: Project Management Sequence Diagram

Medical Management

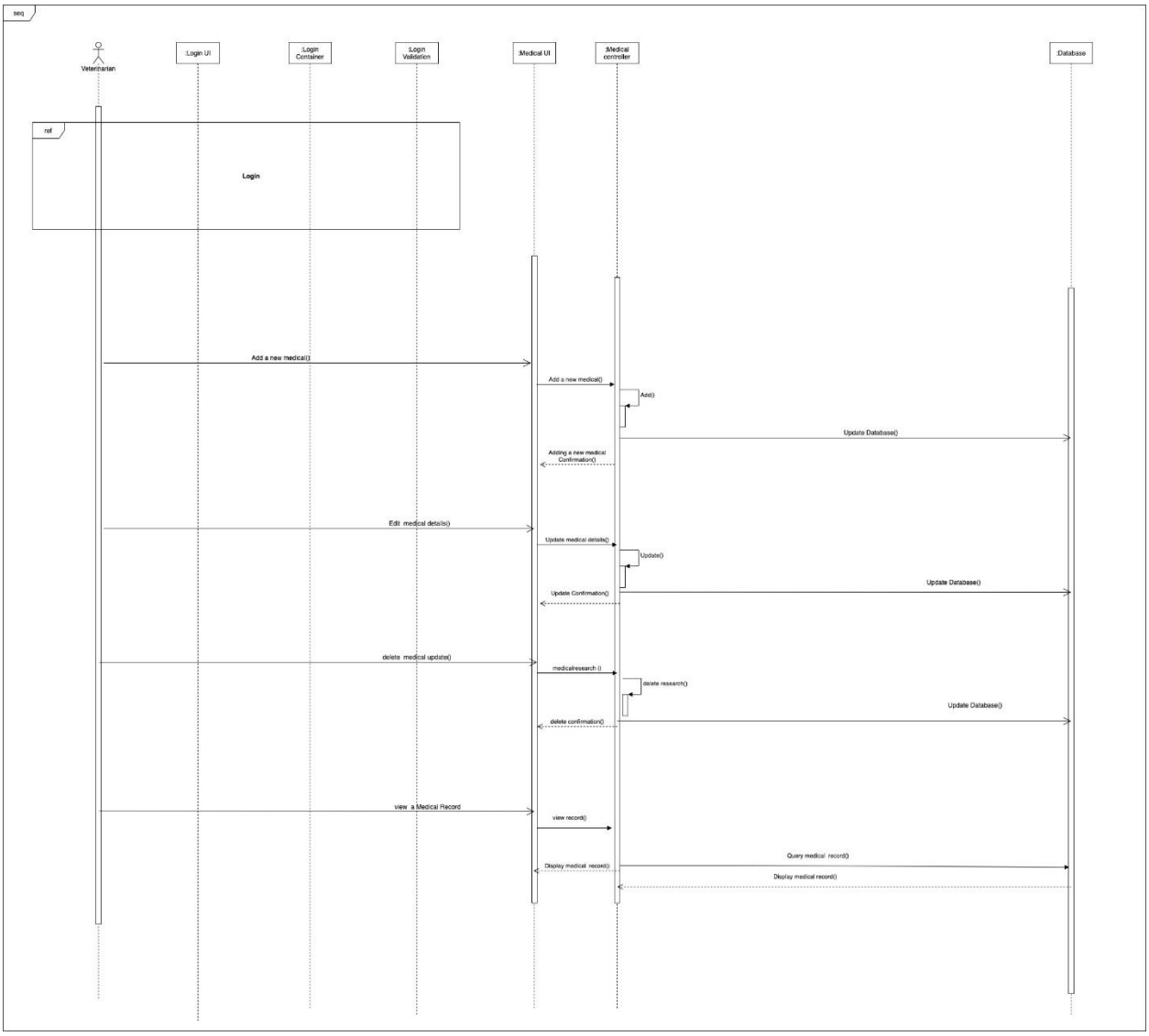


Figure 2.2.2.9: Medical Records Handling Sequence Diagram

Research Documents Handling

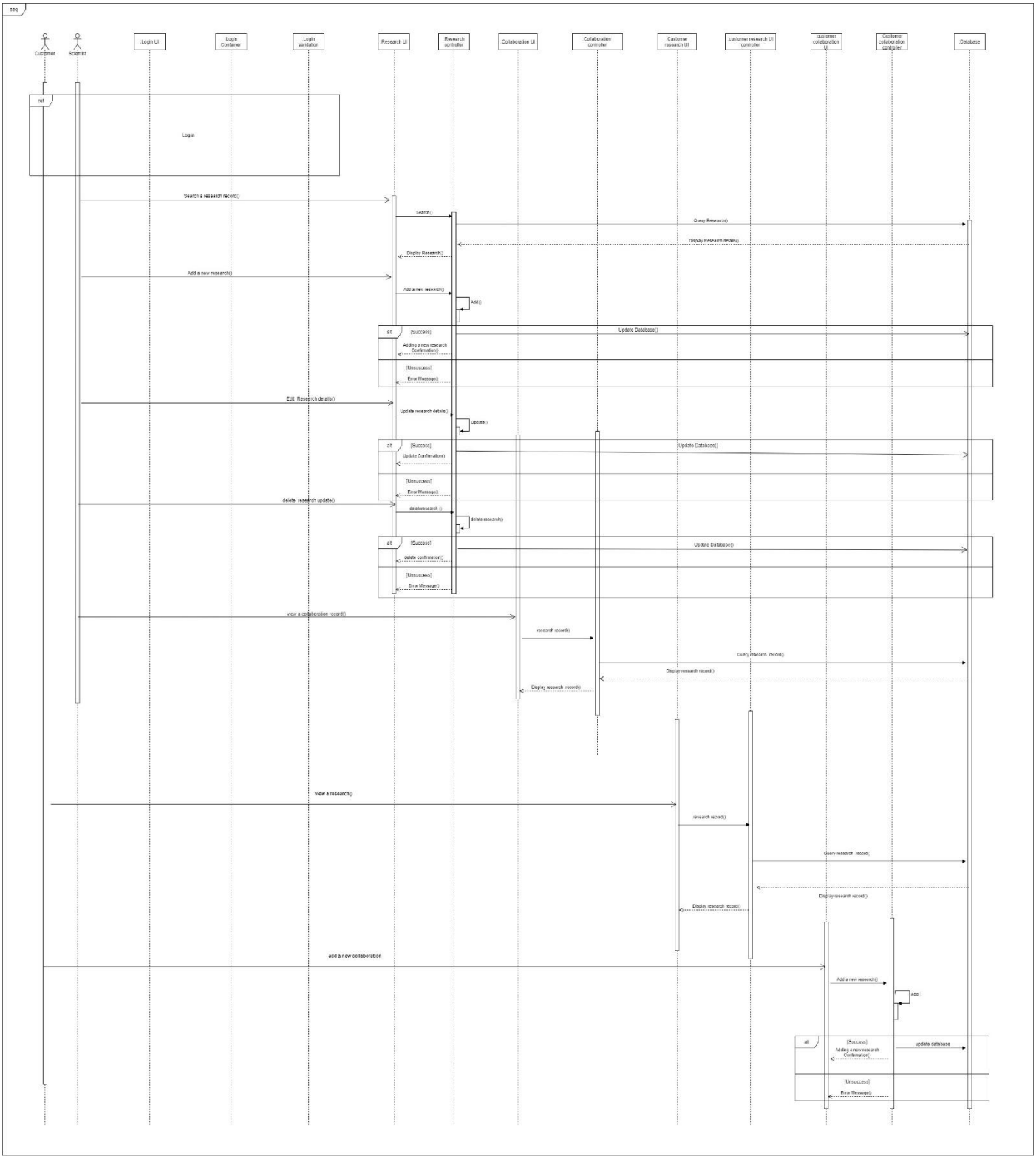


Figure 2.2.2.9: Research Document Handling Sequence Diagram

2.2.3 Interfaces

Common Interfaces

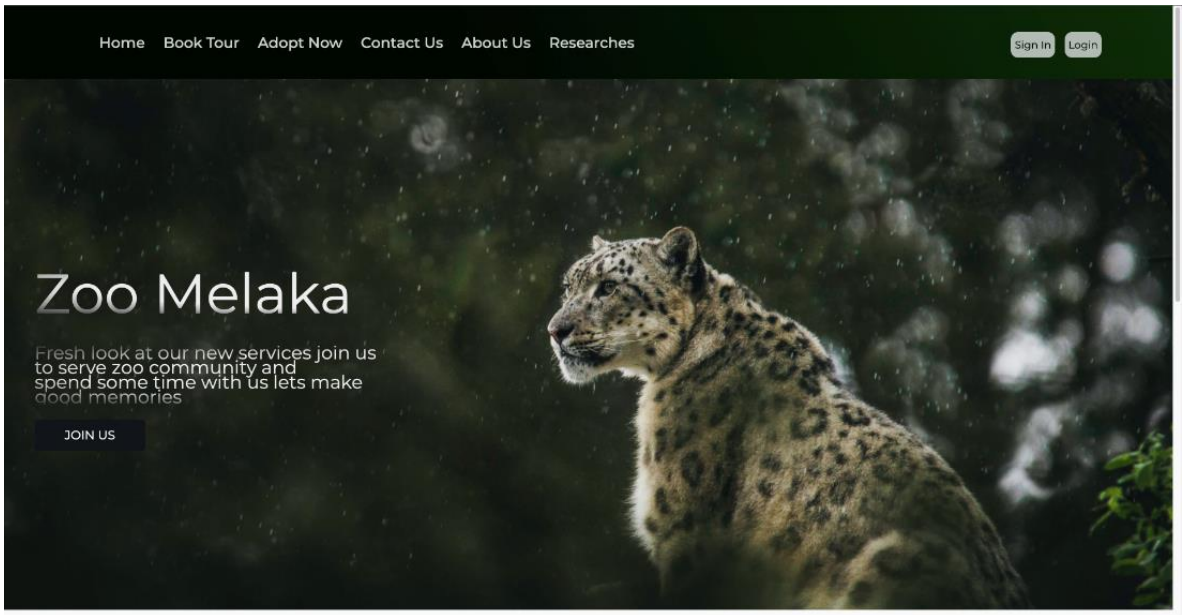


Figure 2.2.3.1: Zoo Melaka Home Page

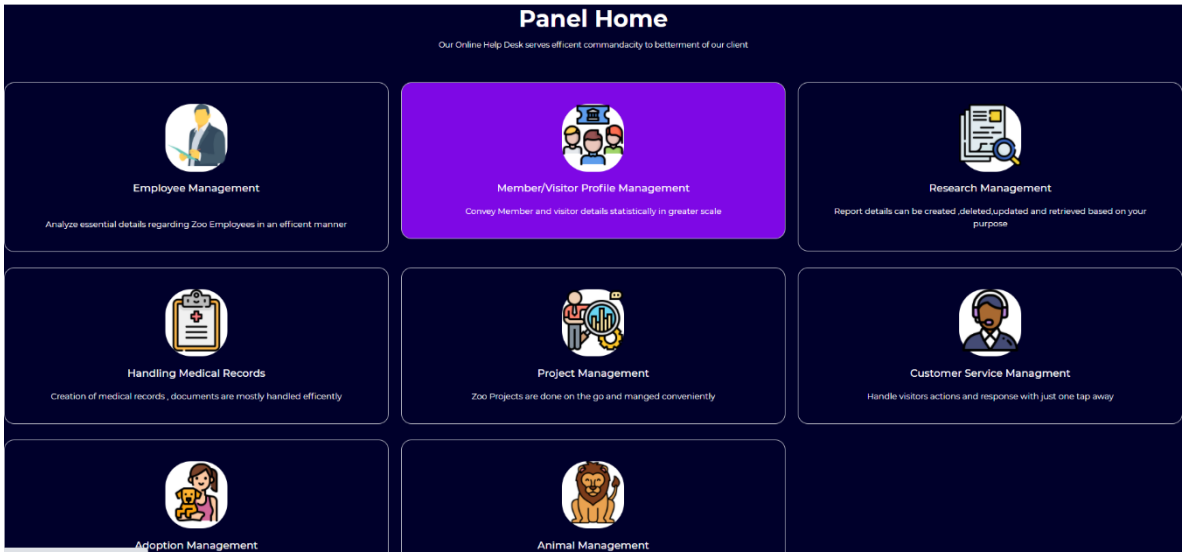


Figure 2.2.3.2: Admin Panel Page

Customer Service Management

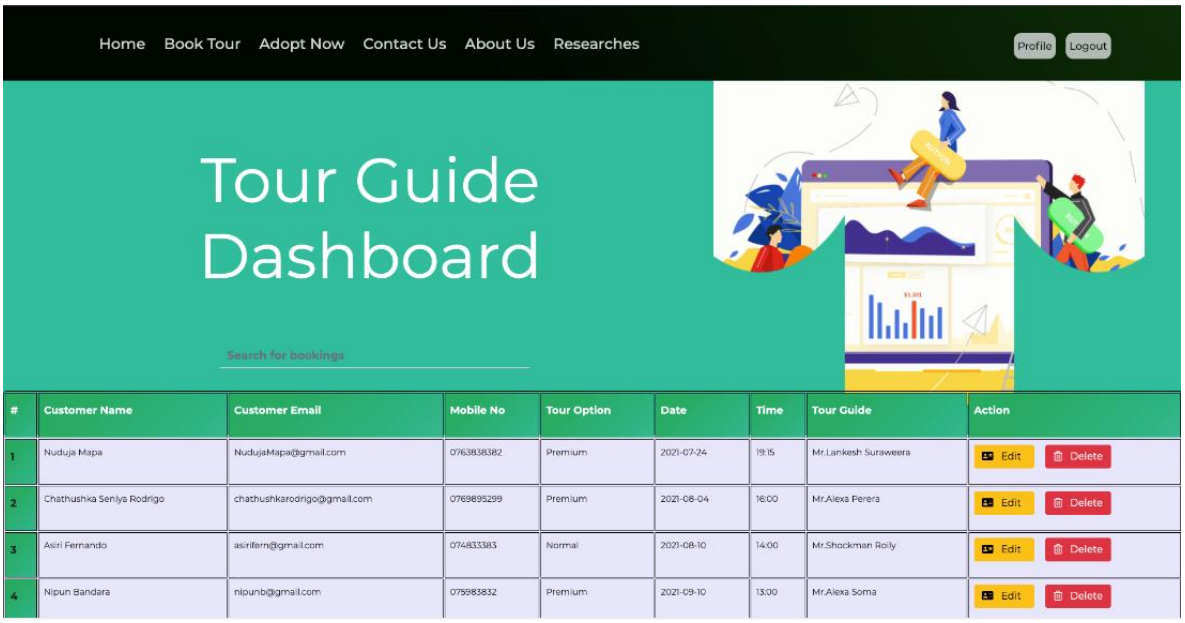


Figure 2.2.3.3 : Tour Guide Dashboard

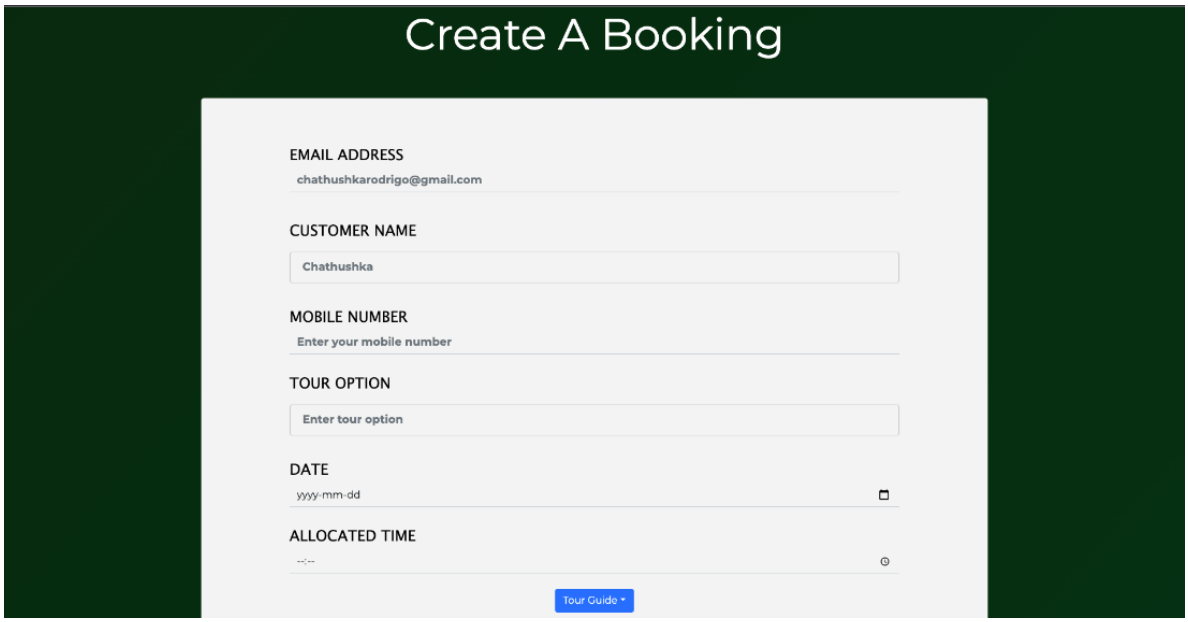


Figure 2.2.3.4 : Create Booking Page

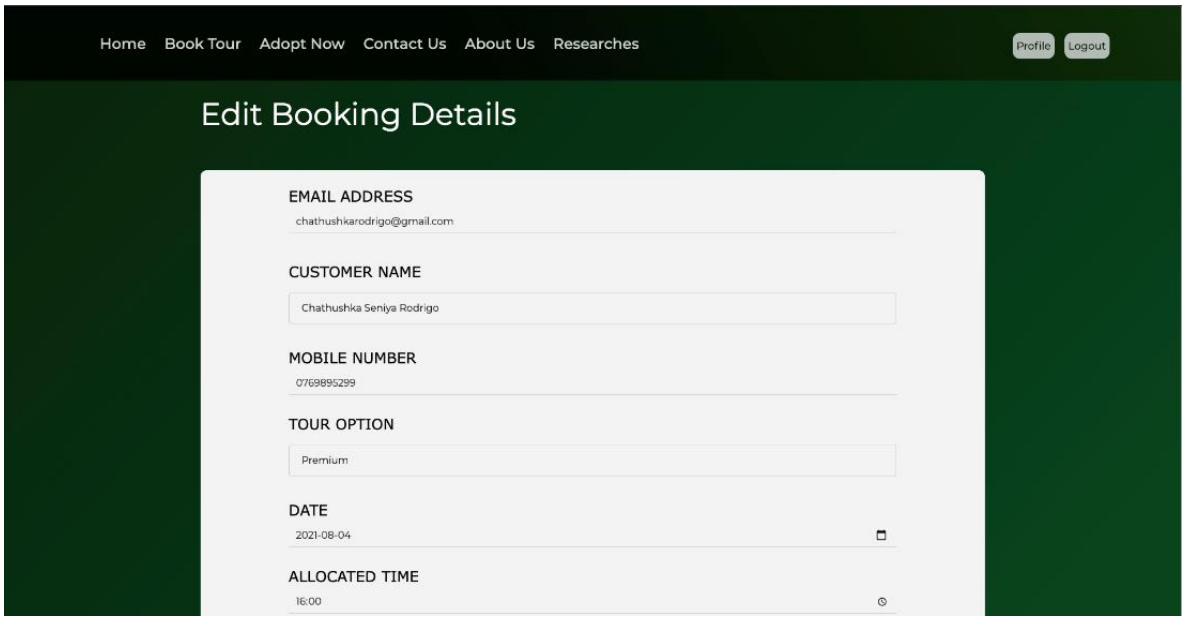


Figure 2.2.3.5 : Edit Booking Page

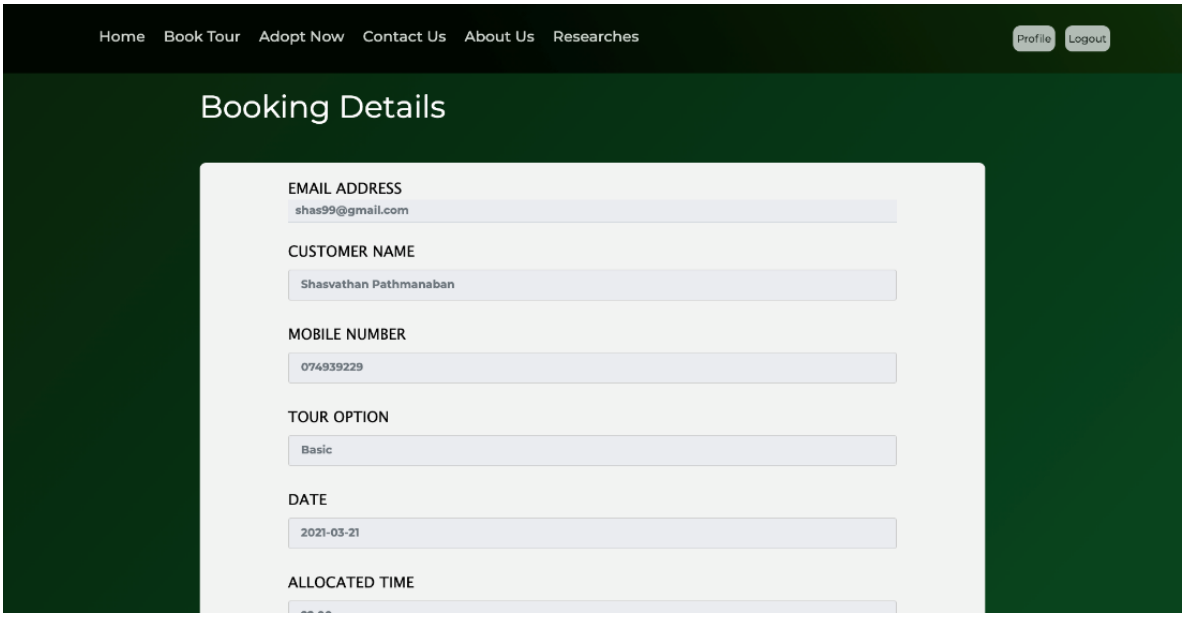


Figure 2.2.3.6 Booking Details Page

Member Management

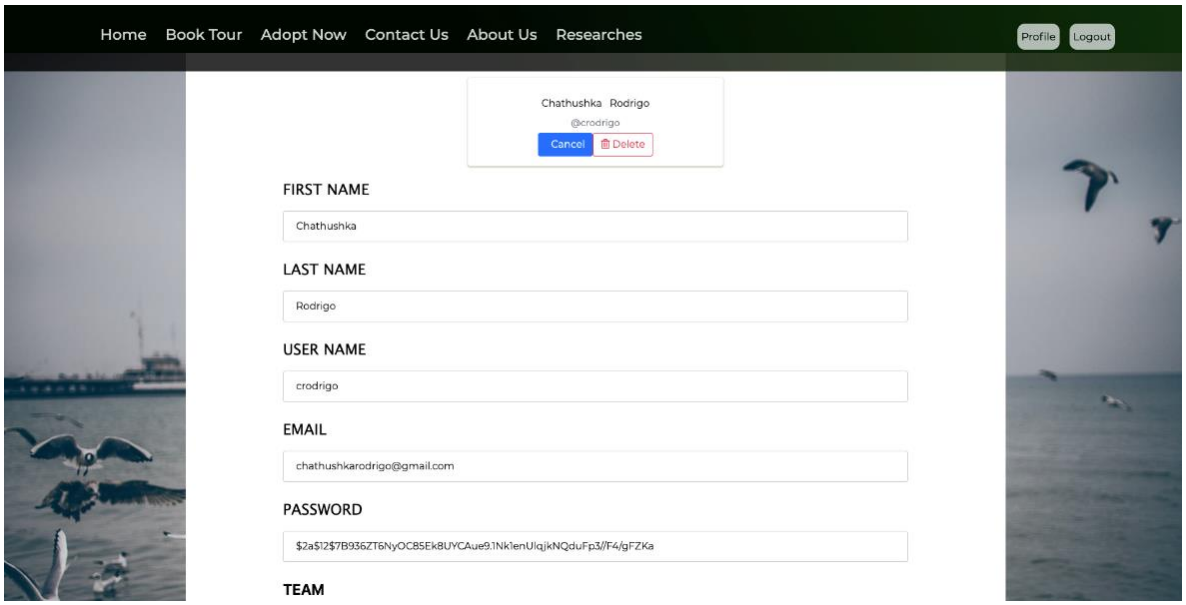


Figure 2.2.3.7 : Edit User Profile Page

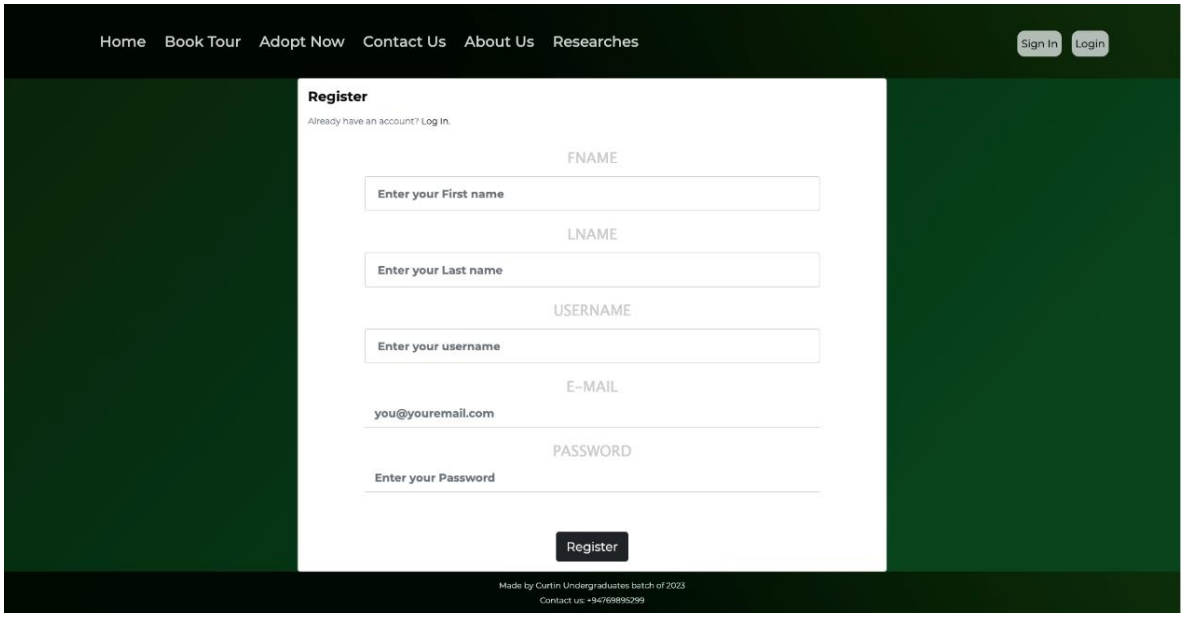


Figure 2.2.3.8 Register User Page

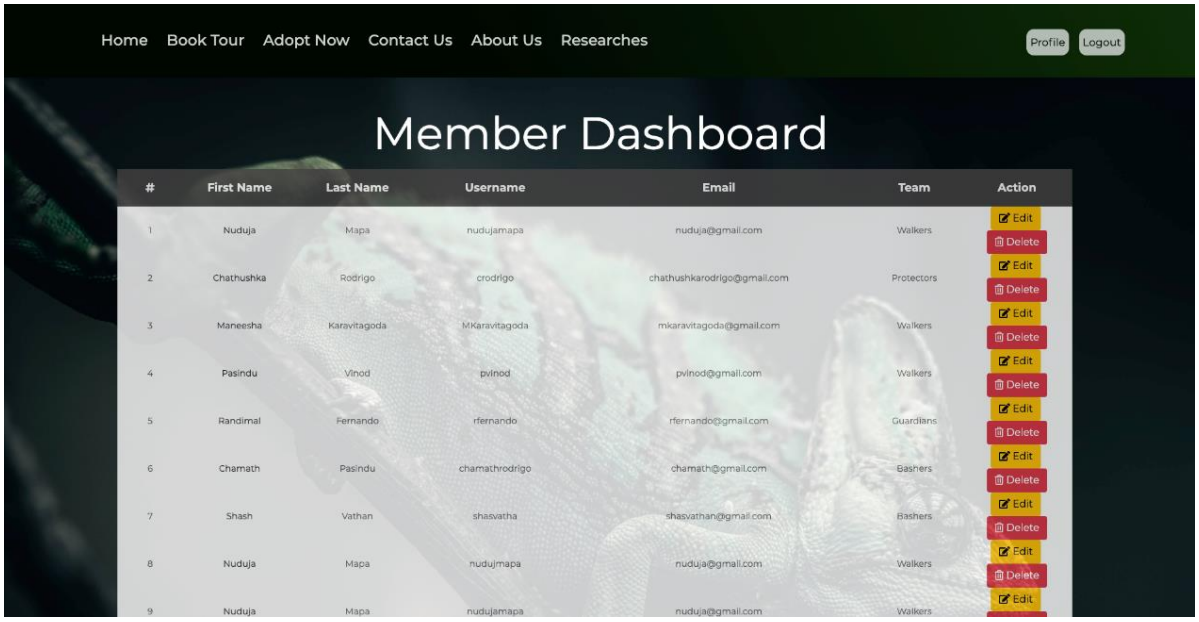


Figure 2.2.3.9 Member Dashboard Page

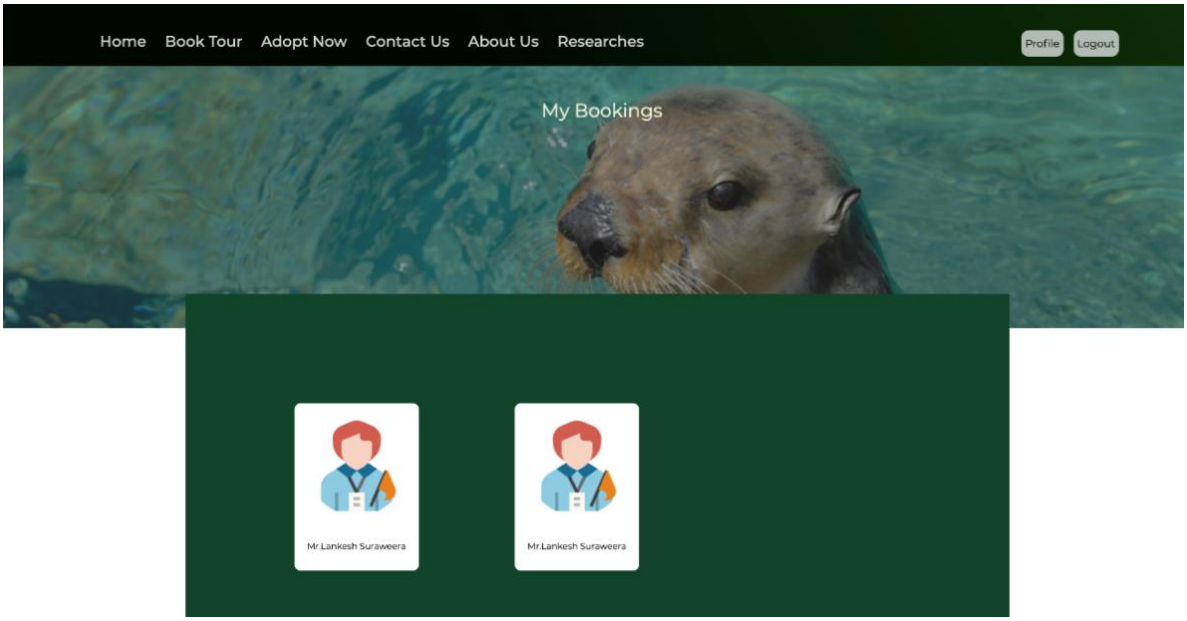


Figure 2.2.3.10: User Bookings Page

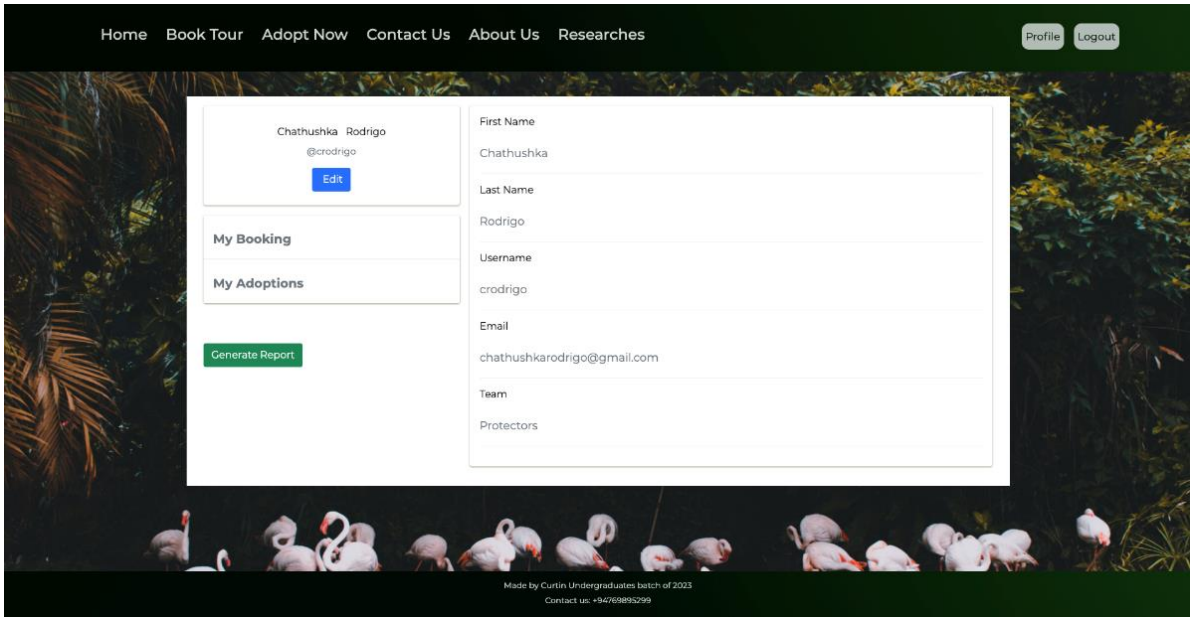


Figure 2.2.3.11: User Details Page

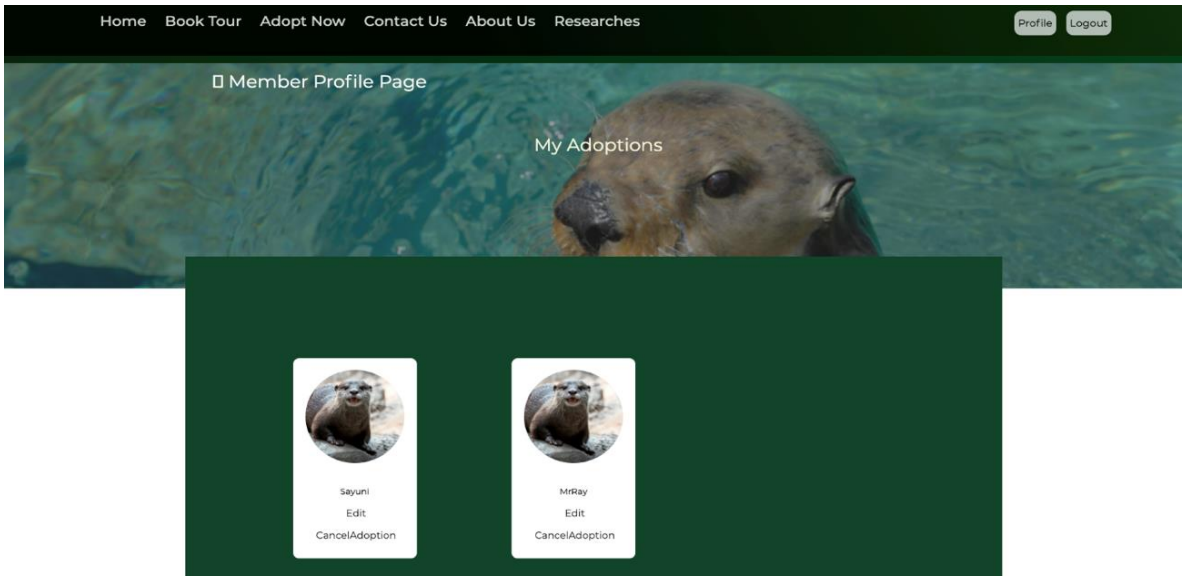


Figure 2.2.3.12 : User Adoptions Page

Animal Adoption

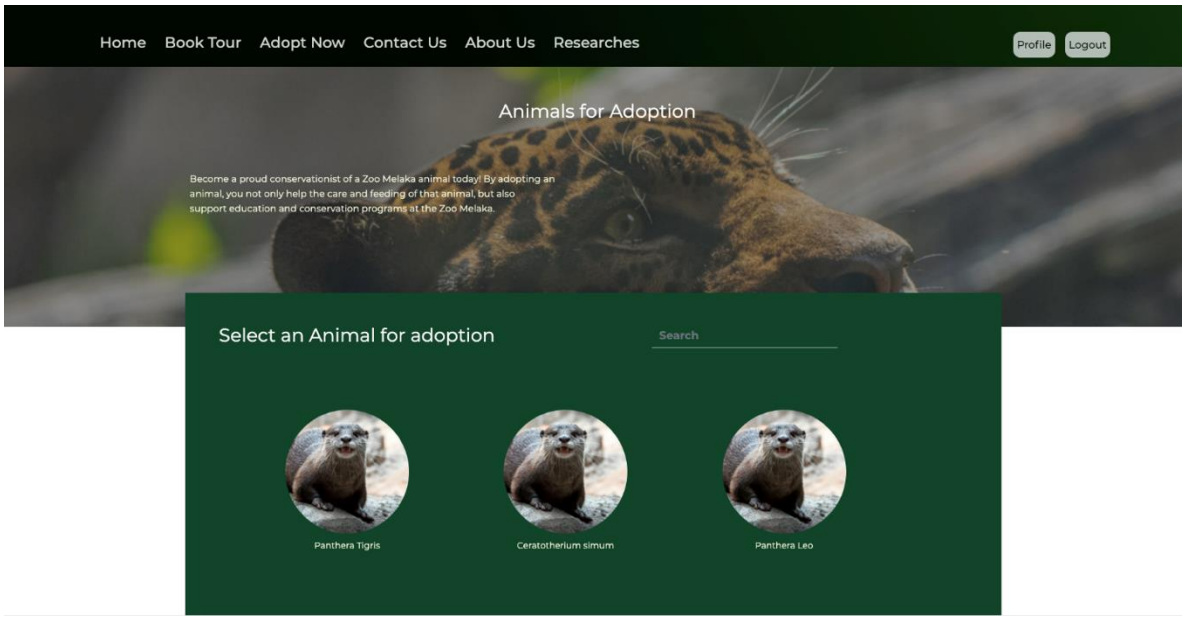


Figure 2.2.3.13: Available Adoptions Page

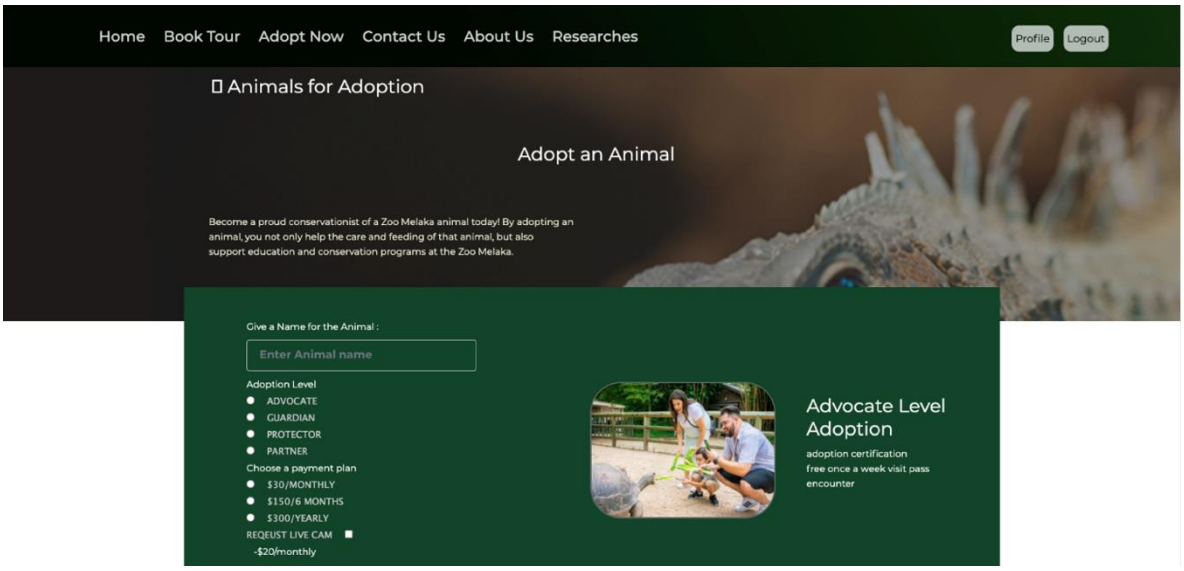


Figure 2.2.3.14: Create Adoption Page

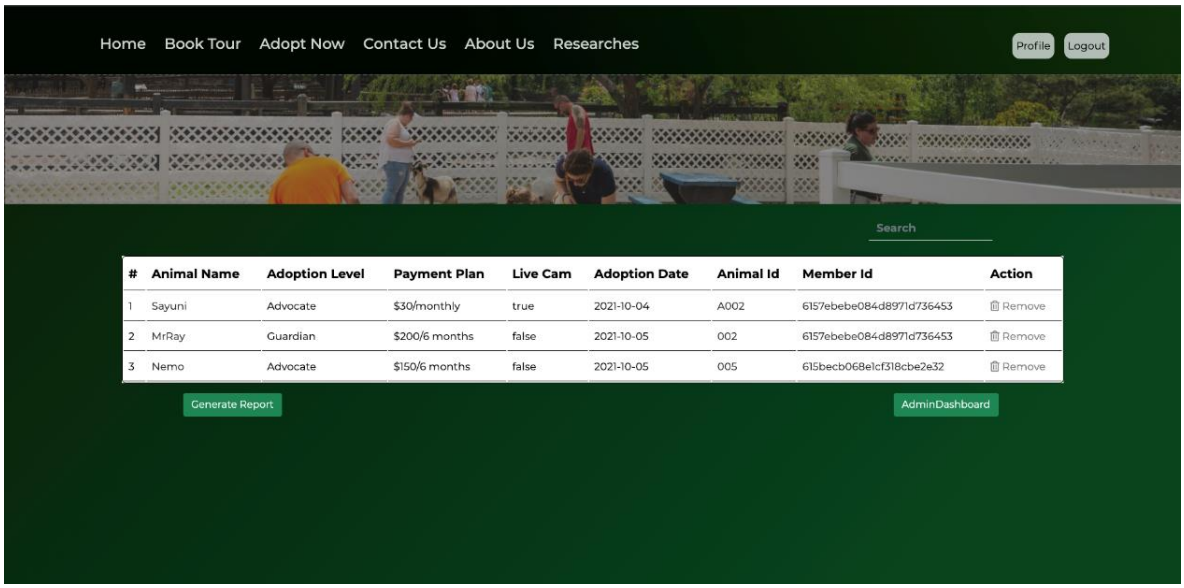


Figure 2.2.3.15: Adoptions Dashboard

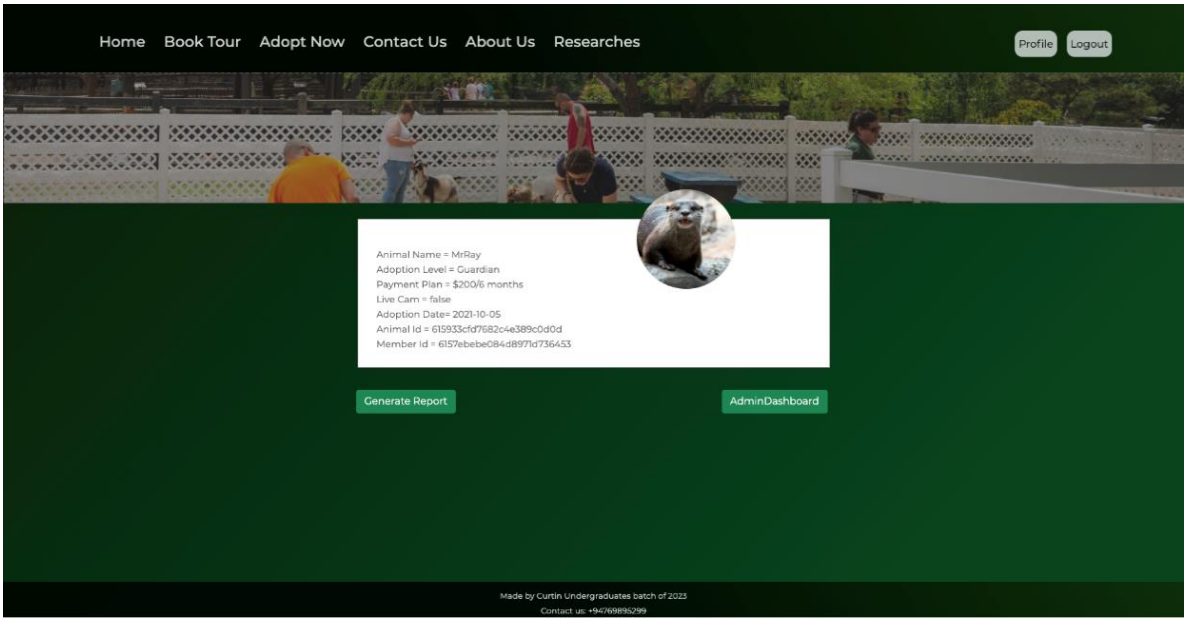


Figure 2.2.3.16: Adoption Details

Employee management

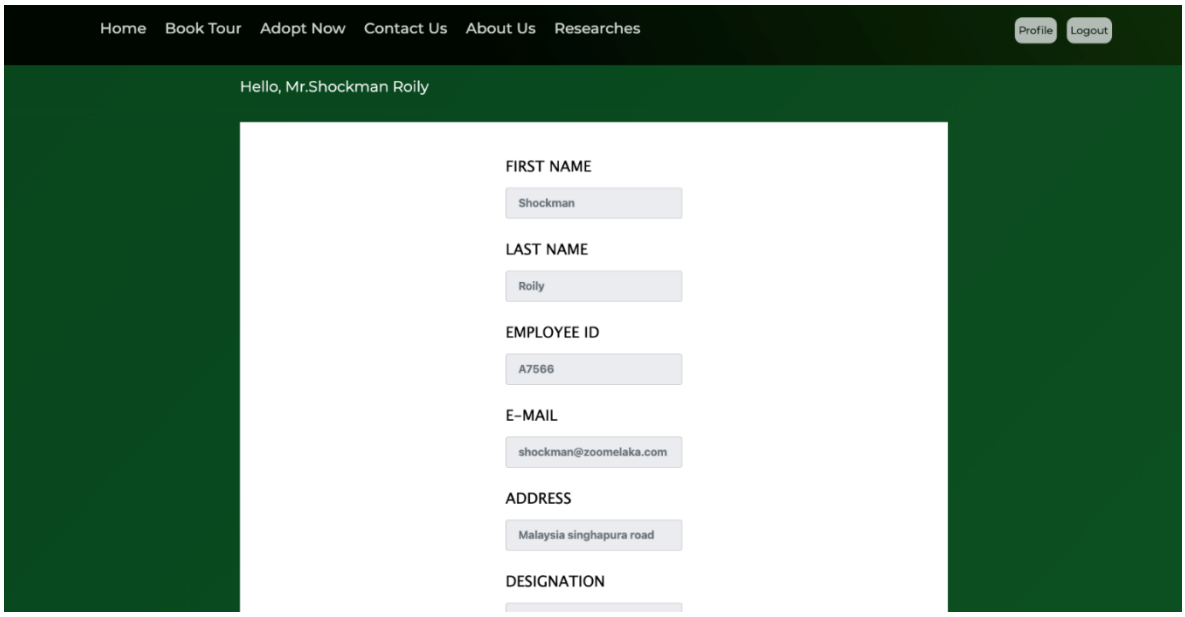
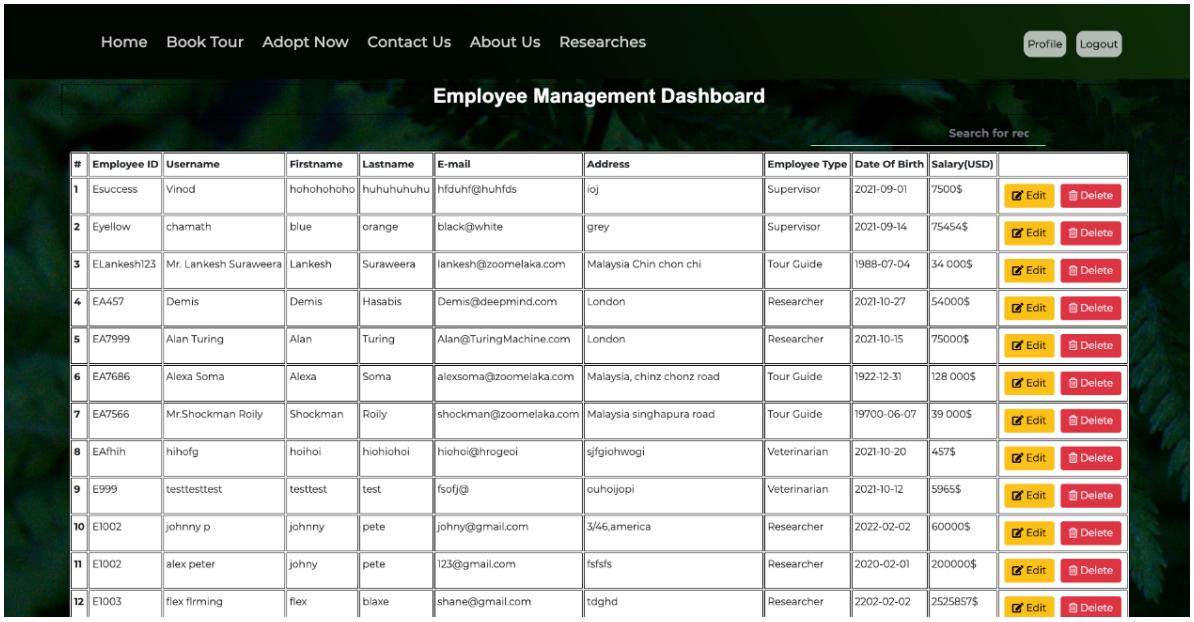


Figure 2.2.3.17: Employee Details Page



#	Employee ID	Username	Firstname	Lastname	E-mail	Address	Employee Type	Date Of Birth	Salary(USD)	
1	Esuccess	Vinod	hohohohoho	huhuhuhuhu	hfduhf@huhfds	ioj	Supervisor	2021-09-01	7500$	Edit Delete
2	Eyellow	chamath	blue	orange	black@white	grey	Supervisor	2021-09-14	75454$	Edit Delete
3	ELankesh123	Mr. Lankesh Suraweera	Lankesh	Suraweera	lankesh@zoomelaka.com	Malaysia Chin chon chi	Tour Guide	1988-07-04	34 000$	Edit Delete
4	EA457	Demis	Demis	Hasabis	Demis@deepmind.com	London	Researcher	2021-10-27	54000$	Edit Delete
5	EA7999	Alan Turing	Alan	Turing	Alan@TuringMachine.com	London	Researcher	2021-10-15	75000$	Edit Delete
6	EA7686	Alexa Soma	Alexa	Soma	alexsoma@zoomelaka.com	Malaysia, chinz chonz road	Tour Guide	1922-12-31	128 000$	Edit Delete
7	EA7566	Mr.Shockman Roily	Shockman	Roily	shockman@zoomelaka.com	Malaysia singhapura road	Tour Guide	19700-06-07	39 000$	Edit Delete
8	EAfhih	hihofg	hoihoi	hiohiohoi	hiohoi@hrogeoi	sjfgiohwogi	Veterinarian	2021-10-20	457$	Edit Delete
9	E999	testtesttest	testtest	test	fsofj@	ouhoijopi	Veterinarian	2021-10-12	5965$	Edit Delete
10	E1002	johnny p	johnny	pete	johny@gmail.com	3/46,america	Researcher	2022-02-02	60000$	Edit Delete
11	E1002	alex peter	johny	pete	123@gmail.com	fsfsfs	Researcher	2020-02-01	200000$	Edit Delete
12	E1003	flex flrming	flex	blaxe	shane@gmail.com	tdghd	Researcher	2202-02-02	2525857$	Edit Delete

Figure 2.2.3.18: Employee Dashboard

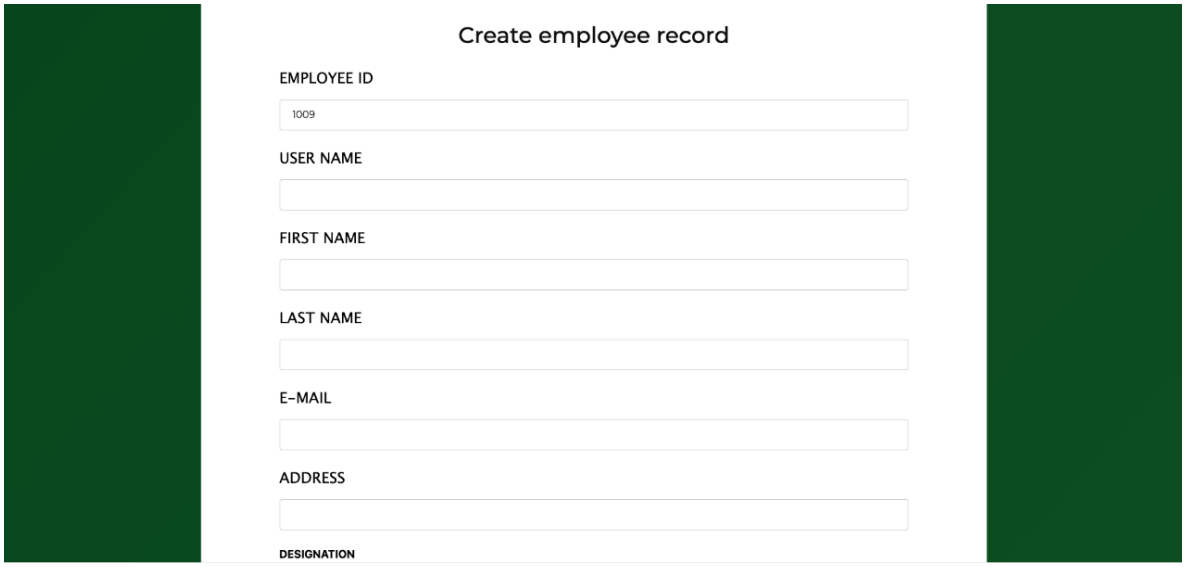


Figure 2.2.3.19: Add New Employee Page

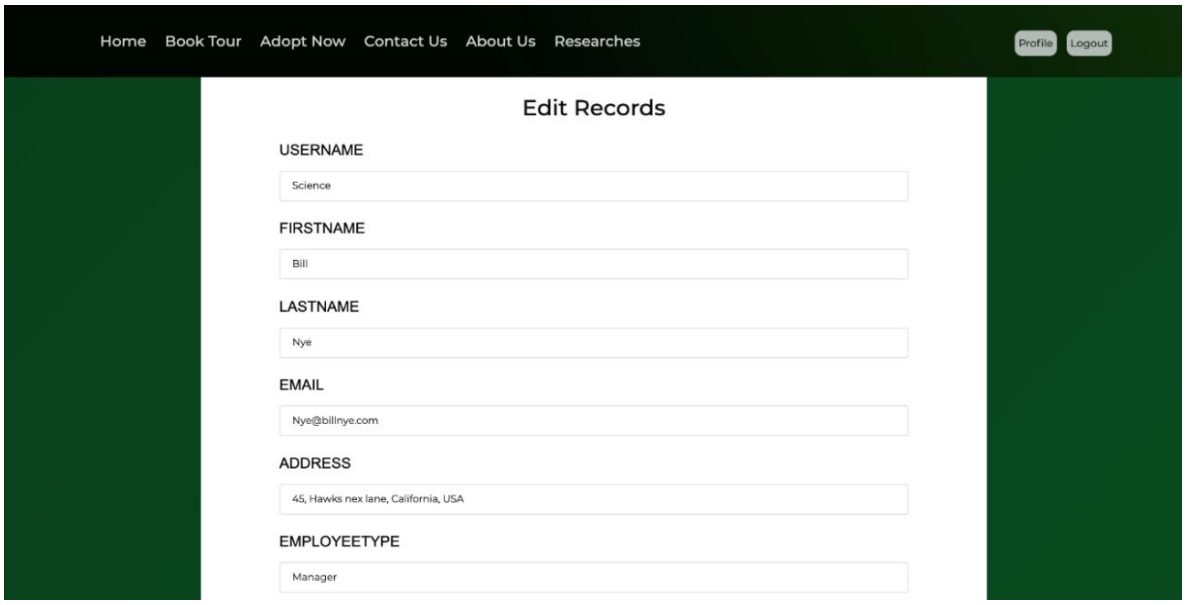


Figure 2.2.3.20: Edit Employee Records Page

Animal Management

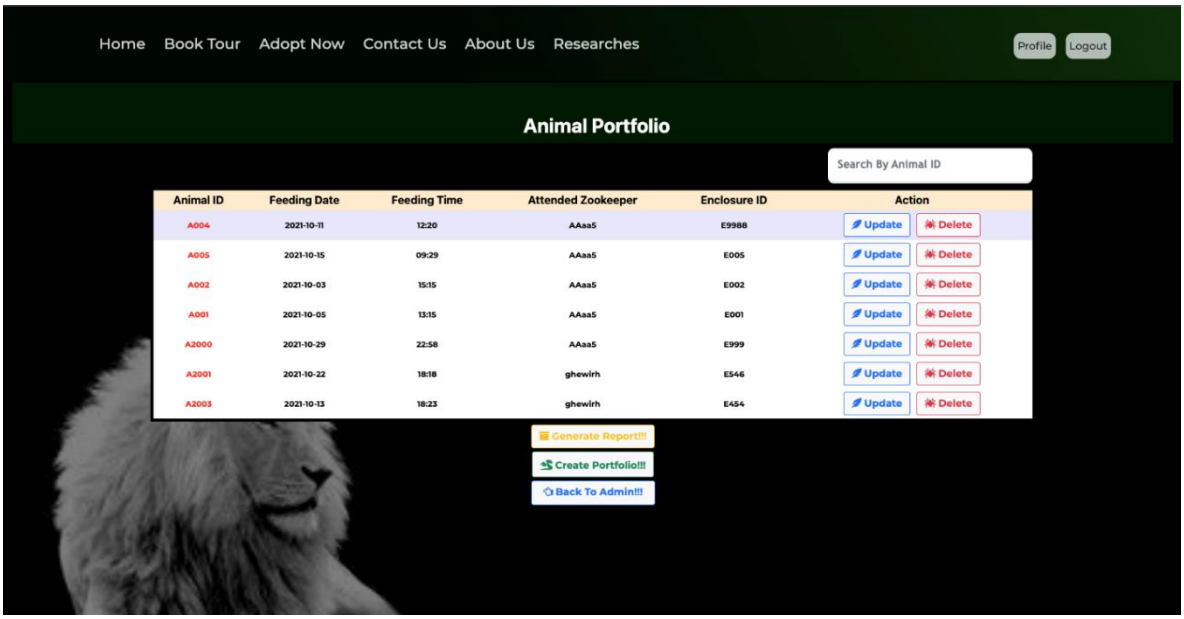


Figure 2.2.3.21: Animal Dashboard

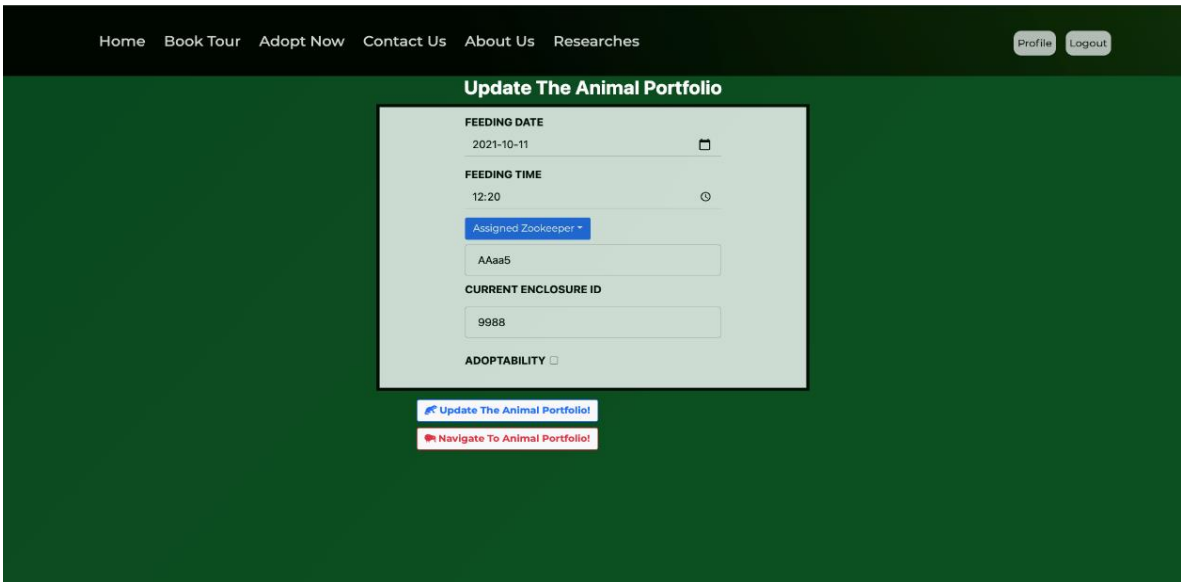


Figure 2.2.3.22: Update Animal Records Page

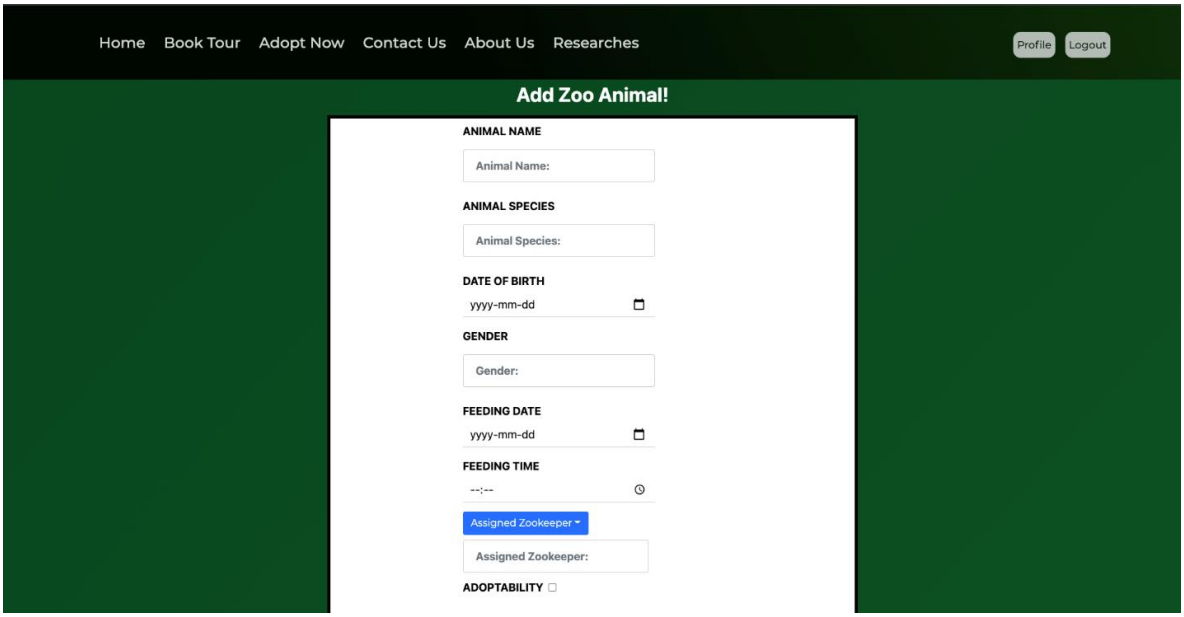


Figure 2.2.3.23: Create Animal Records Page

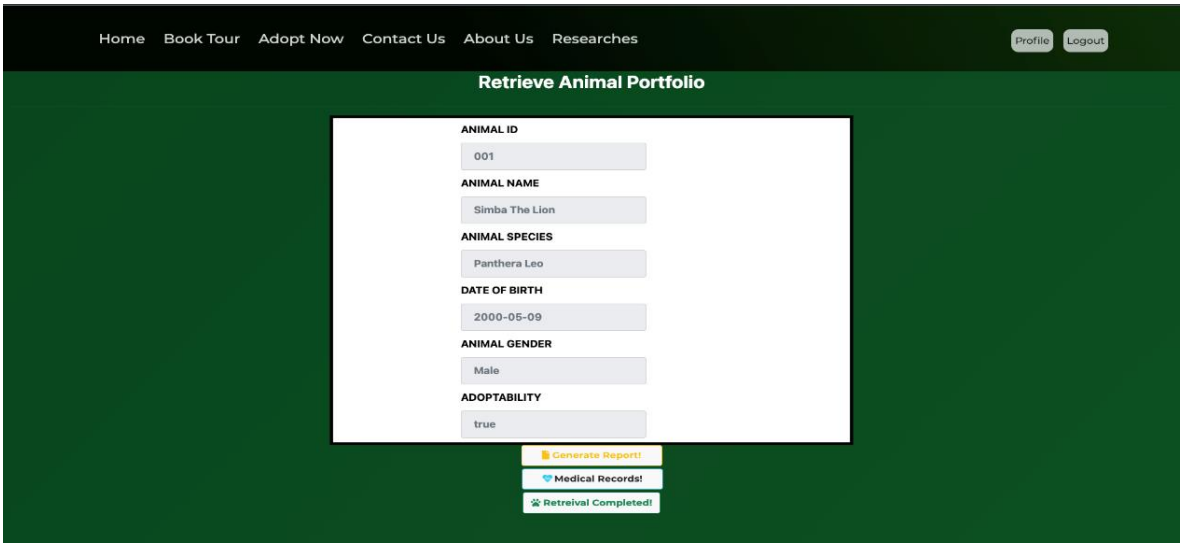


Figure 2.2.3.24: Retrieve Animal Details Page

Project management

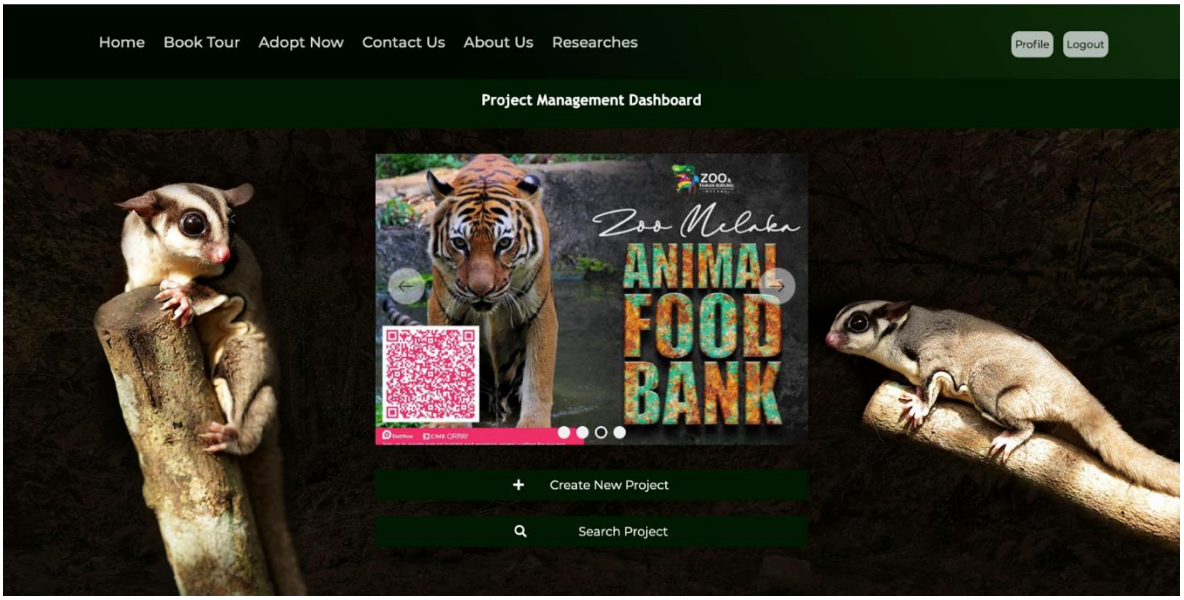
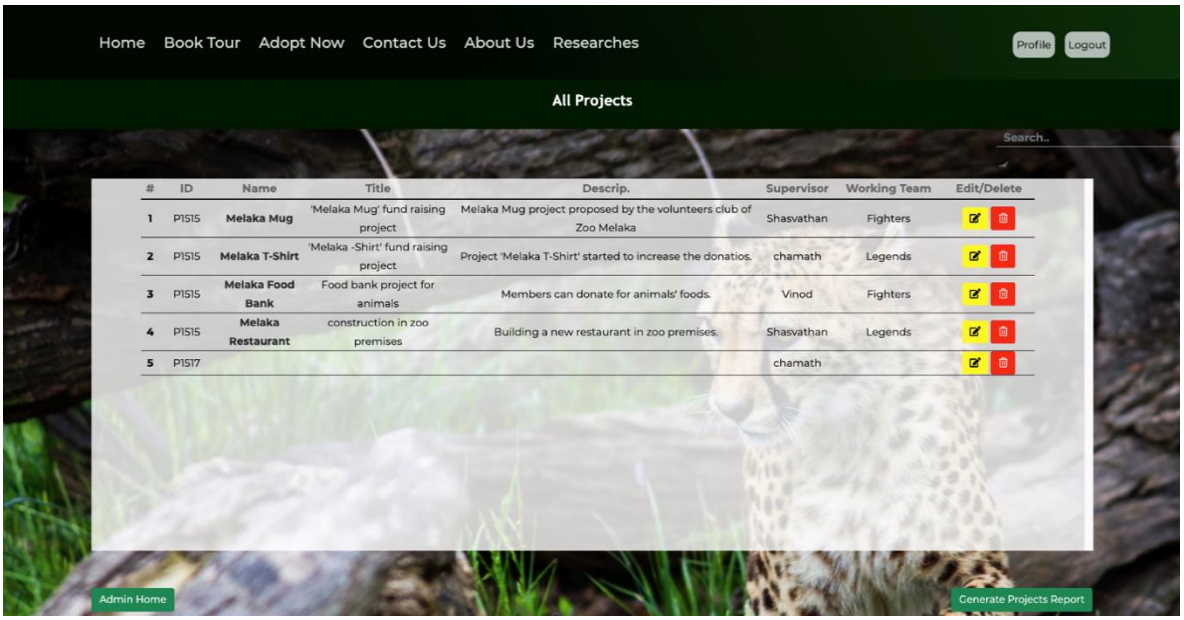


Figure 2.2.3.25: Project Management Dashboard



#	ID	Name	Title	Descrip.	Supervisor	Working Team	Edit/Delete
1	P1515	Melaka Mug	'Melaka Mug' fund raising project	Melaka Mug project proposed by the volunteers club of Zoo Melaka	Shasvathan	Fighters	
2	P1515	Melaka T-Shirt	'Melaka -Shirt' fund raising project	Project 'Melaka T-Shirt' started to increase the donatios.	chamath	Legends	
3	P1515	Melaka Food Bank	Food bank project for animals	Members can donate for animals' foods.	Vinod	Fighters	
4	P1515	Melaka Restaurant	construction in zoo premises	Building a new restaurant in zoo premises.	Shasvathan	Legends	
5	P1517				chamath		

Figure 2.2.3.26: Project Management All Projects

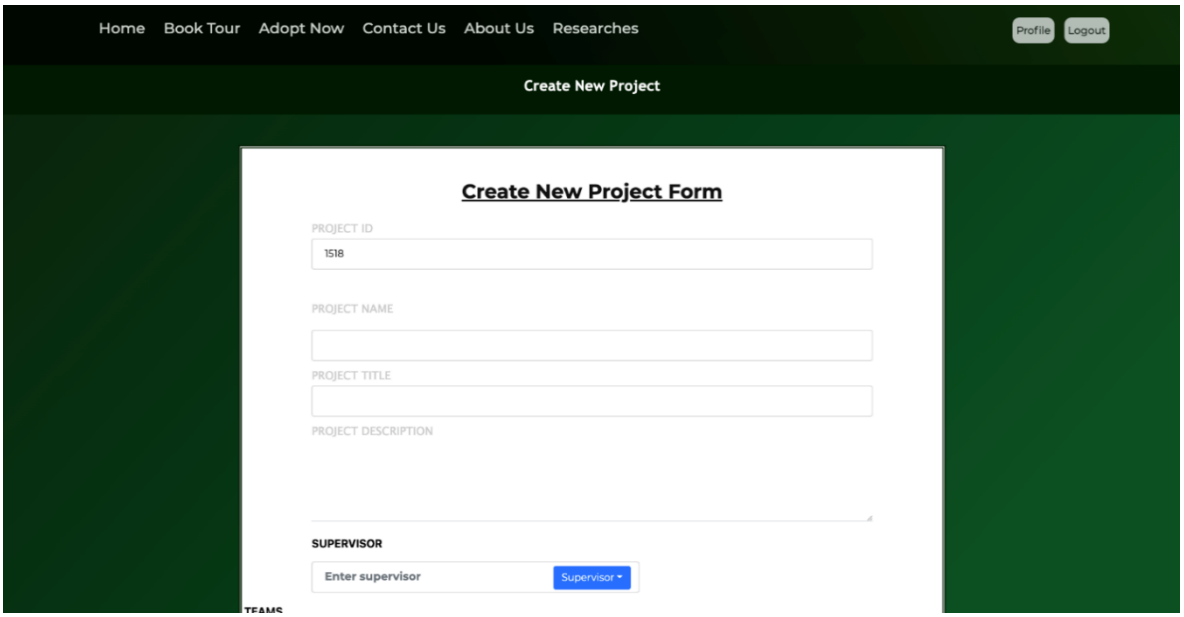


Figure 2.2.3.27: Project Management - Create Projects Page

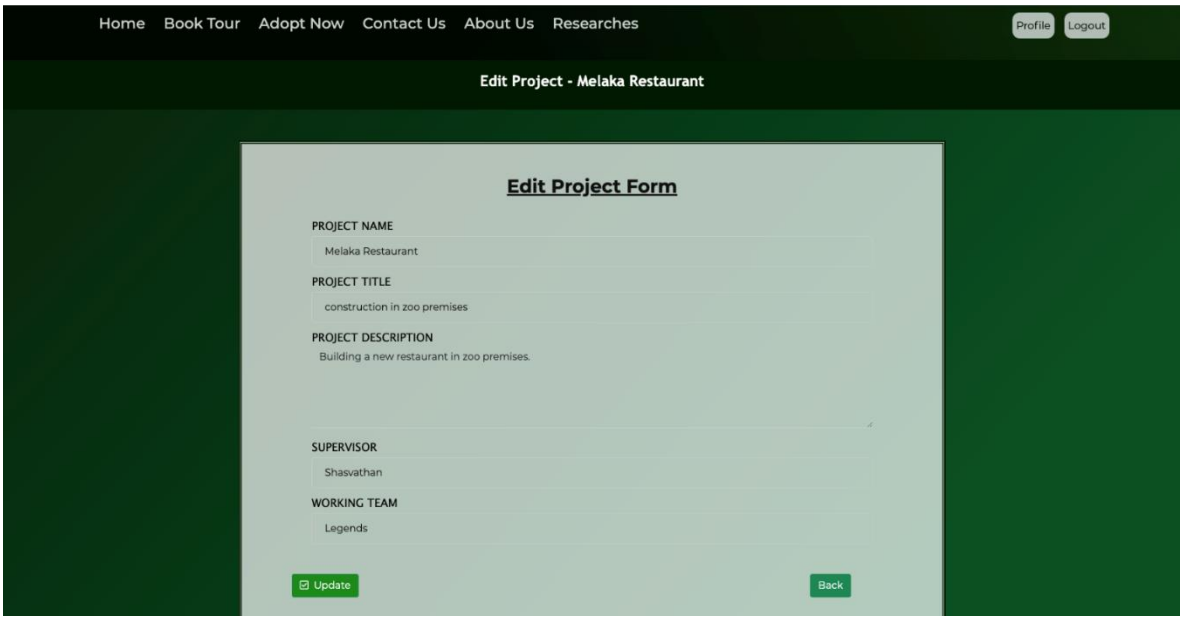


Figure 2.2.3.28: Edit Project Details Page

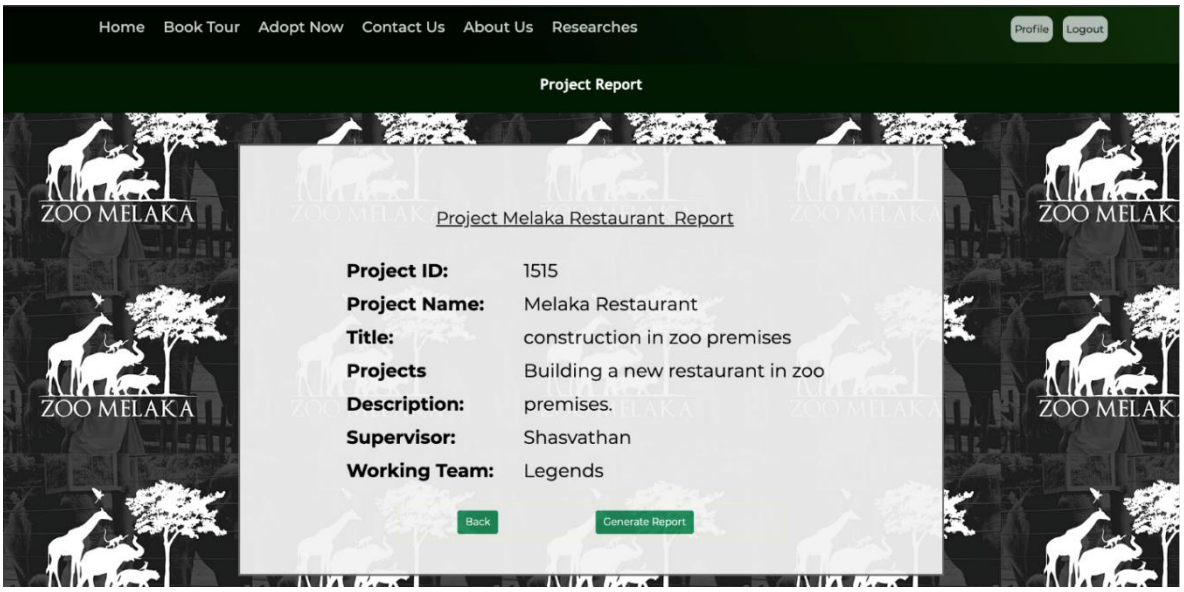


Figure 2.2.3.29: Projects Retrieve & Report Page

Medical Records Handling

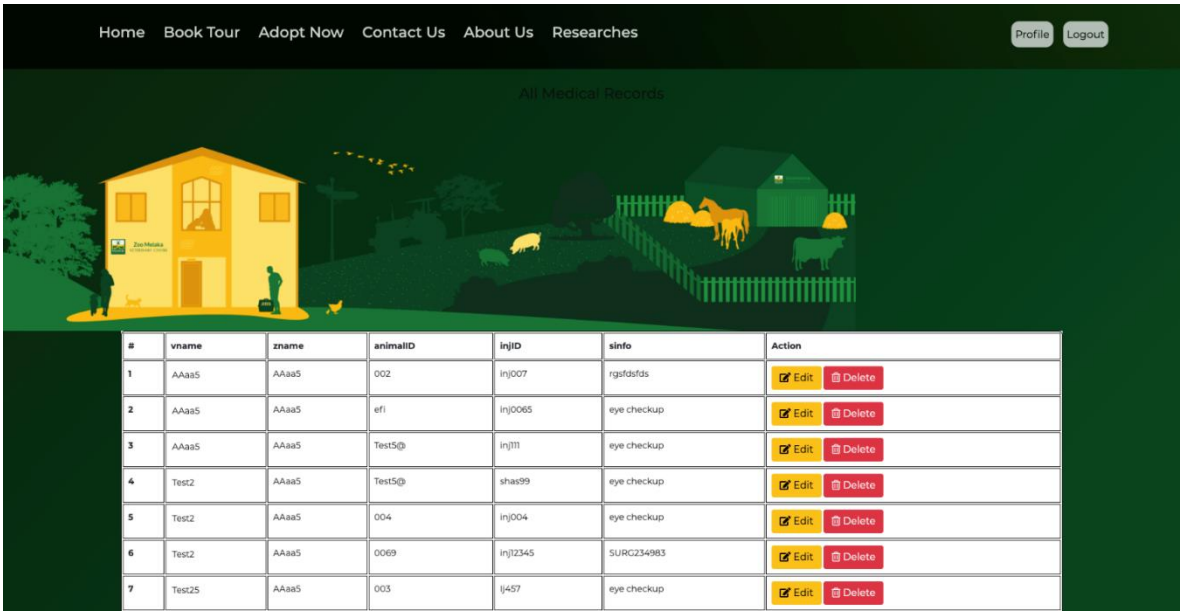


Figure 2.2.3.30: Handling Medical Records Dashboard

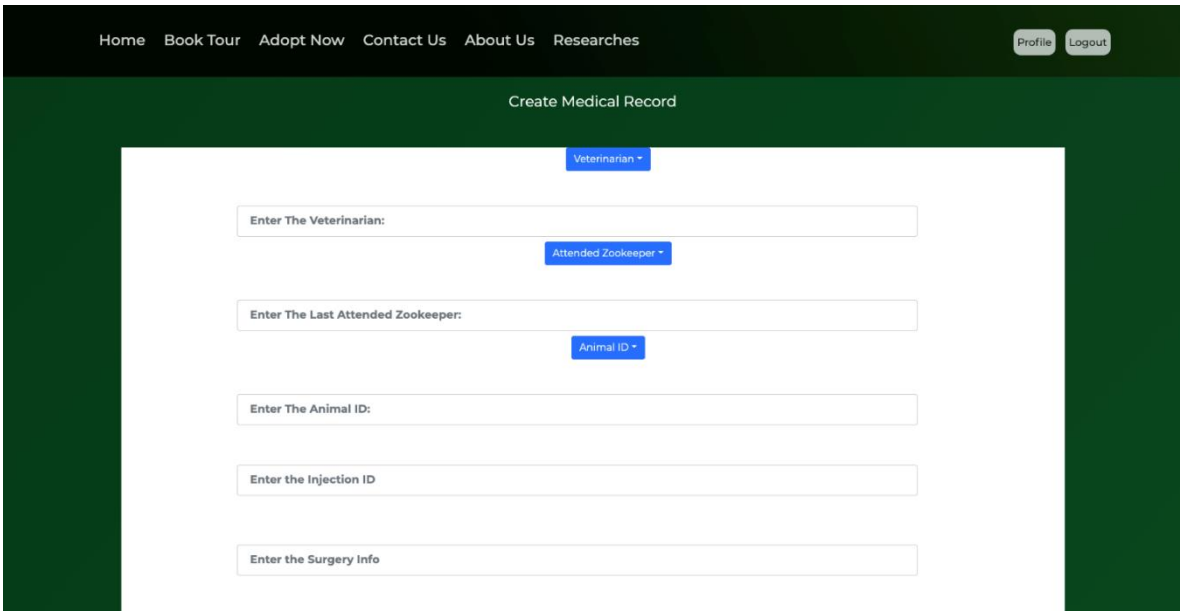


Figure 2.2.3.31: Create Medical Records Page

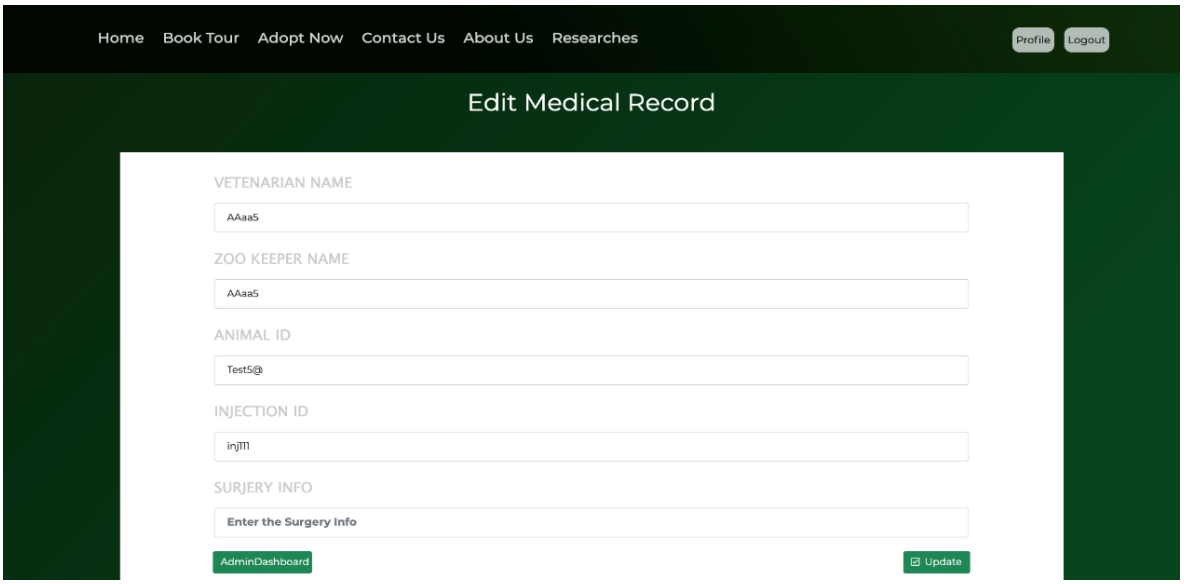


Figure 2.2.3.32: Edit Medical Records Page

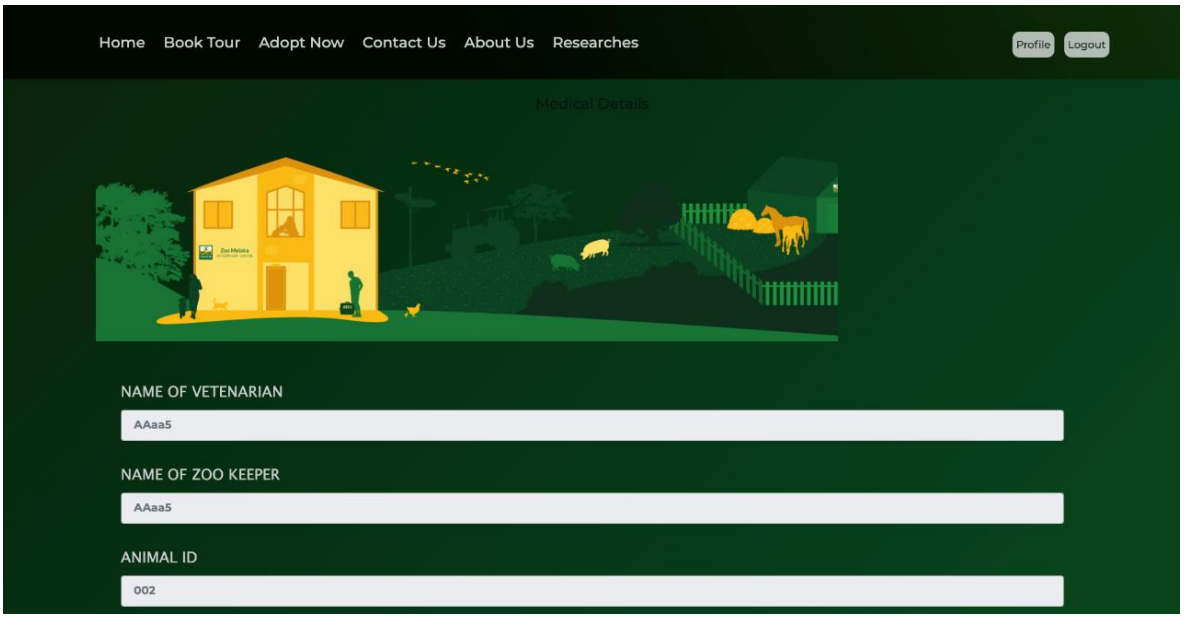
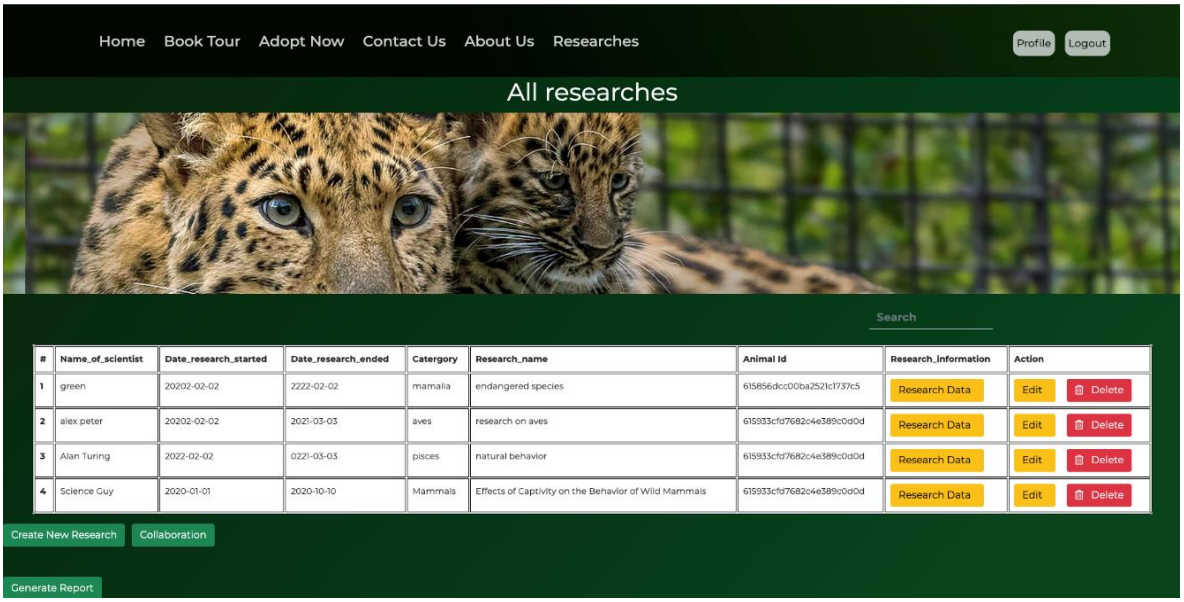


Figure 2.2.3.33: Retrieve Medical Details Page

Research Document Handling



#	Name_of_scientist	Date_research_started	Date_research_ended	Catergory	Research_name	Animal Id	Research_information	Action
1	green	20202-02-02	2222-02-02	mamalia	endangered species	615856dcc00ba2521c1737c5	Research Data	Edit Delete
2	alex peter	20202-02-02	2021-03-03	aves	research on aves	615933cfd7682c4e389c0d0d	Research Data	Edit Delete
3	Alan Turing	2022-02-02	0221-03-03	pisces	natural behavior	615933cfd7682c4e389c0d0d	Research Data	Edit Delete
4	Science Guy	2020-01-01	2020-10-10	Mammals	Effects of Captivity on the Behavior of Wild Mammals	615933cfd7682c4e389c0d0d	Research Data	Edit Delete

Figure 2.2.3.34: Research Management Dashboard

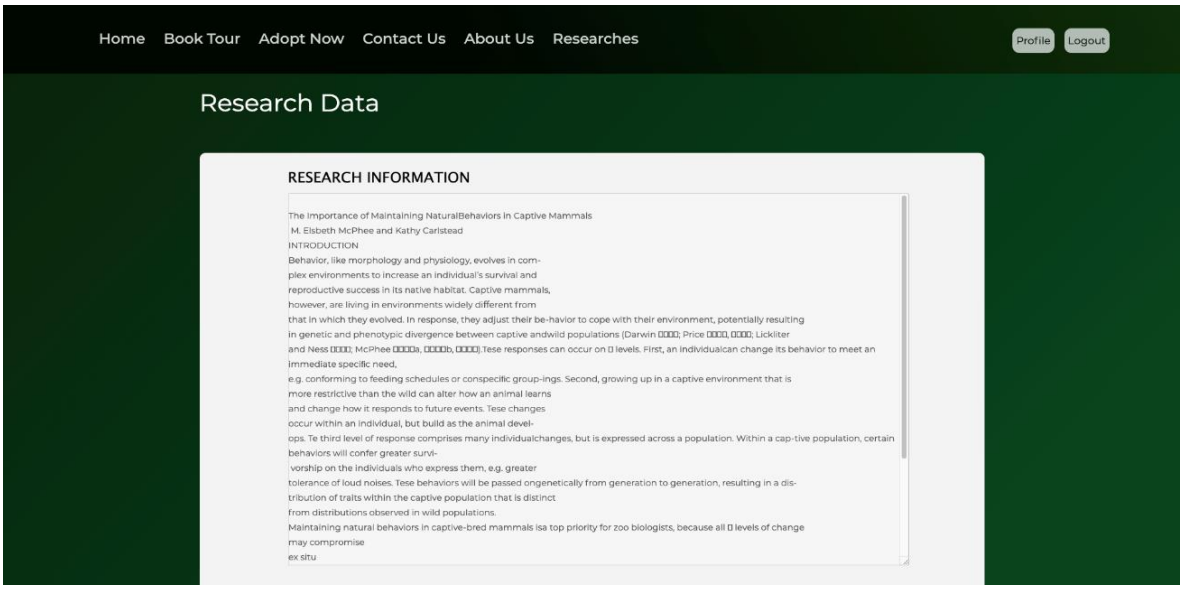
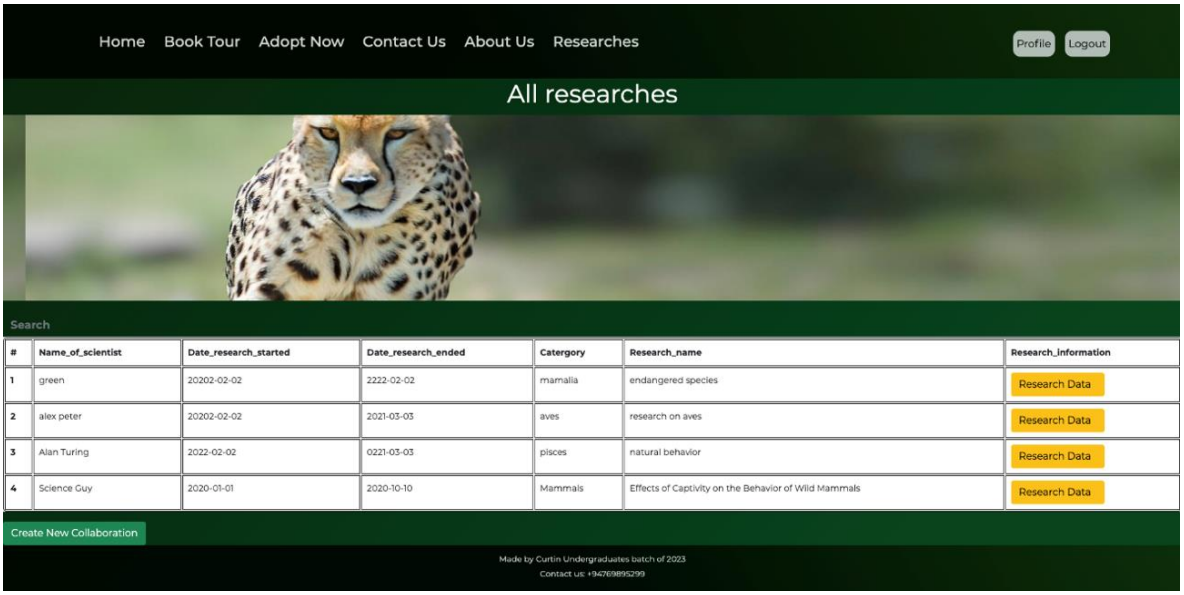


Figure 2.2.3.35: Research Information Page



#	Name_of_scientist	Date_research_started	Date_research_ended	Catergory	Research_name	Research_Information
1	green	20202-02-02	2222-02-02	mamalia	endangered species	Research Data
2	alex peter	20202-02-02	2021-03-03	aves	research on aves	Research Data
3	Alan Turing	2022-02-02	0221-03-03	pisces	natural behavior	Research Data
4	Science Guy	2020-01-01	2020-10-10	Mammals	Effects of Captivity on the Behavior of Wild Mammals	Research Data

Figure 2.2.3.36: All Research Page

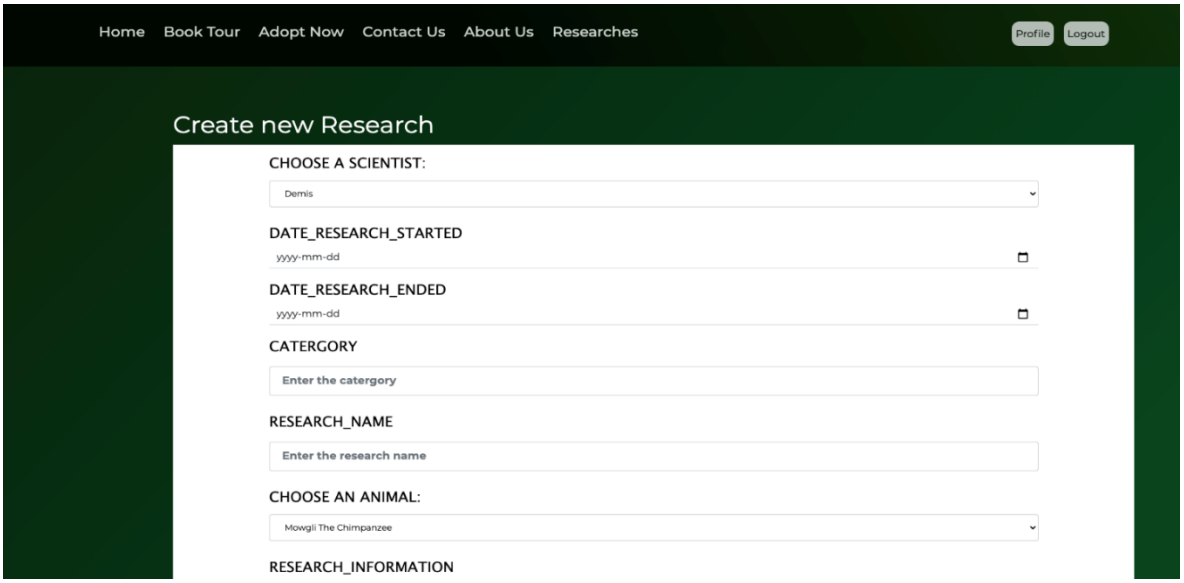
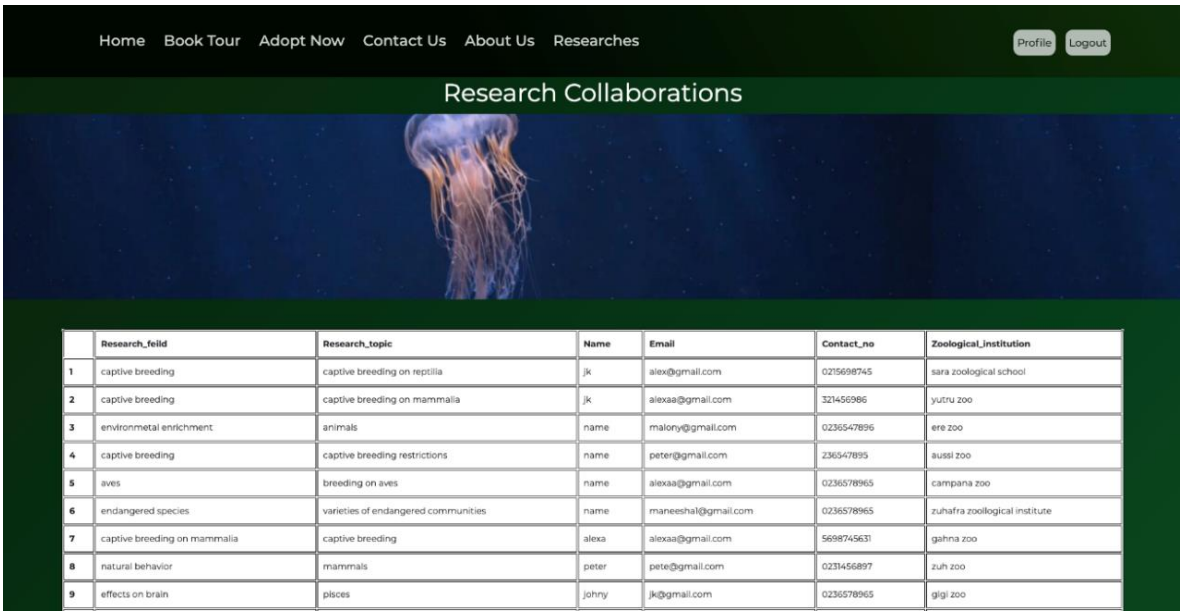


Figure 2.2.3.37: Create Research Page



	Research_feild	Research_topic	Name	Email	Contact_no	Zoological_institution
1	captive breeding	captive breeding on reptilia	jk	alex@gmail.com	0215698745	sara zoological school
2	captive breeding	captive breeding on mammalia	jk	alexaa@gmail.com	321456986	yutru zoo
3	environmetal enrichment	animals	name	malony@gmail.com	0236547896	ere zoo
4	captive breeding	captive breeding restrictions	name	peter@gmail.com	236547895	aussi zoo
5	aves	breeding on aves	name	alexaa@gmail.com	0236578965	campana zoo
6	endangered species	varieties of endangered communities	name	maneeshal@gmail.com	0236578965	zuhafra zoollogical institute
7	captive breeding on mammalia	captive breeding	alexa	alexaa@gmail.com	5698745631	gahna zoo
8	natural behavior	mammals	peter	pete@gmail.com	0231456897	zuh zoo
9	effects on brain	pisces	johny	jk@gmail.com	0236578965	gigi zoo

Figure 2.2.3.38: Research Collaborations Page

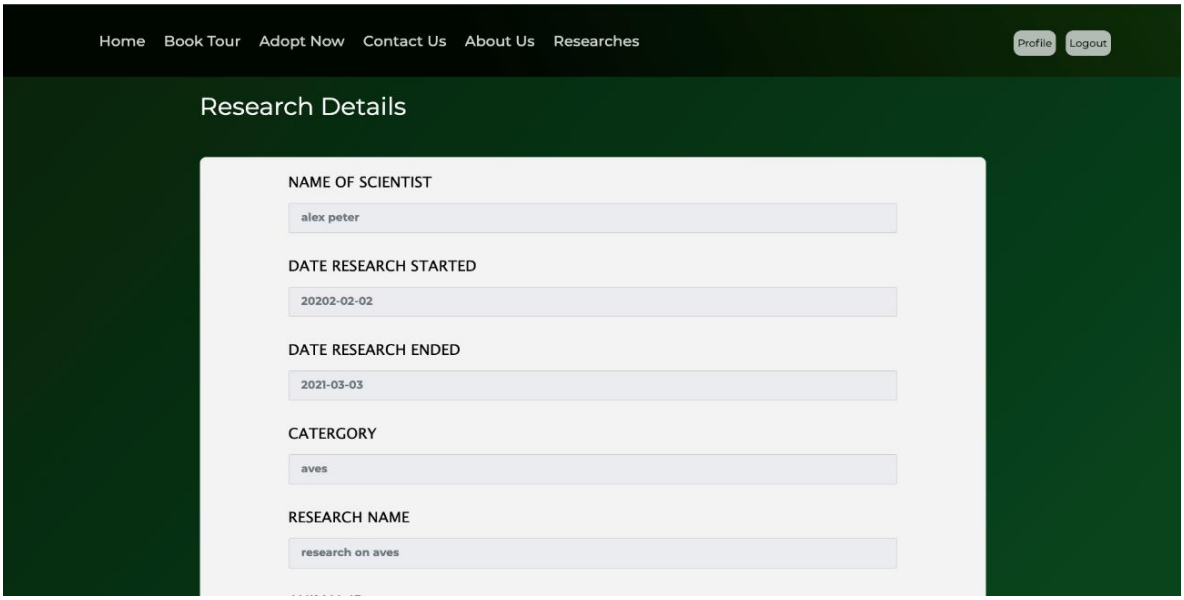


Figure 2.2.3.39: Research Details Page

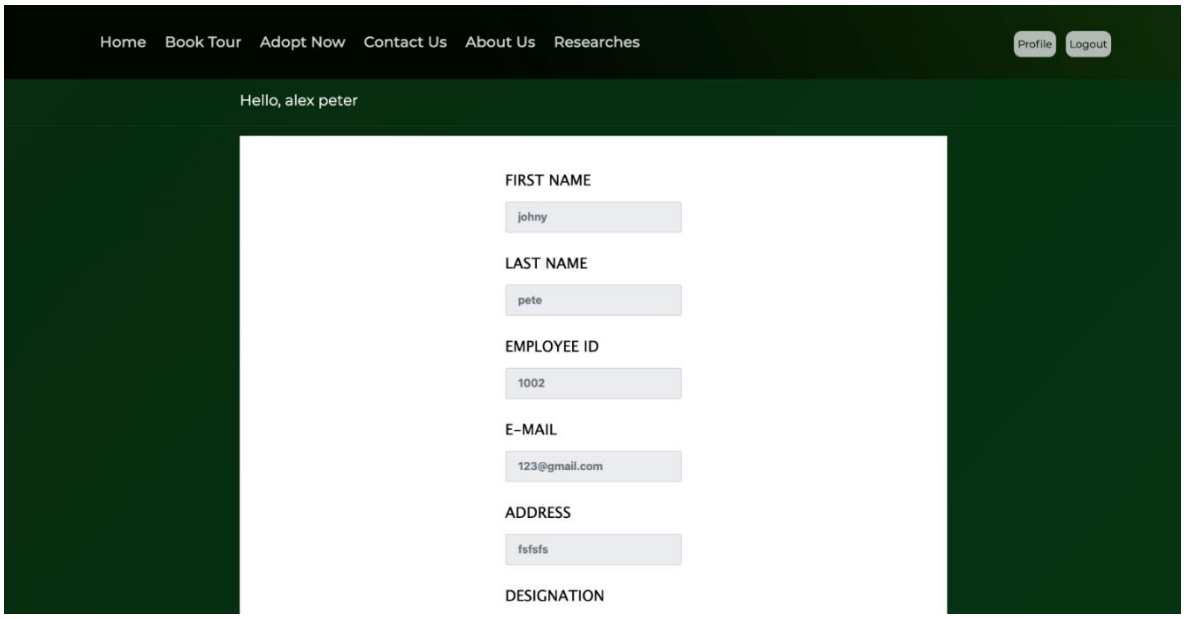


Figure 2.2.3.40: Researcher Details Page 2

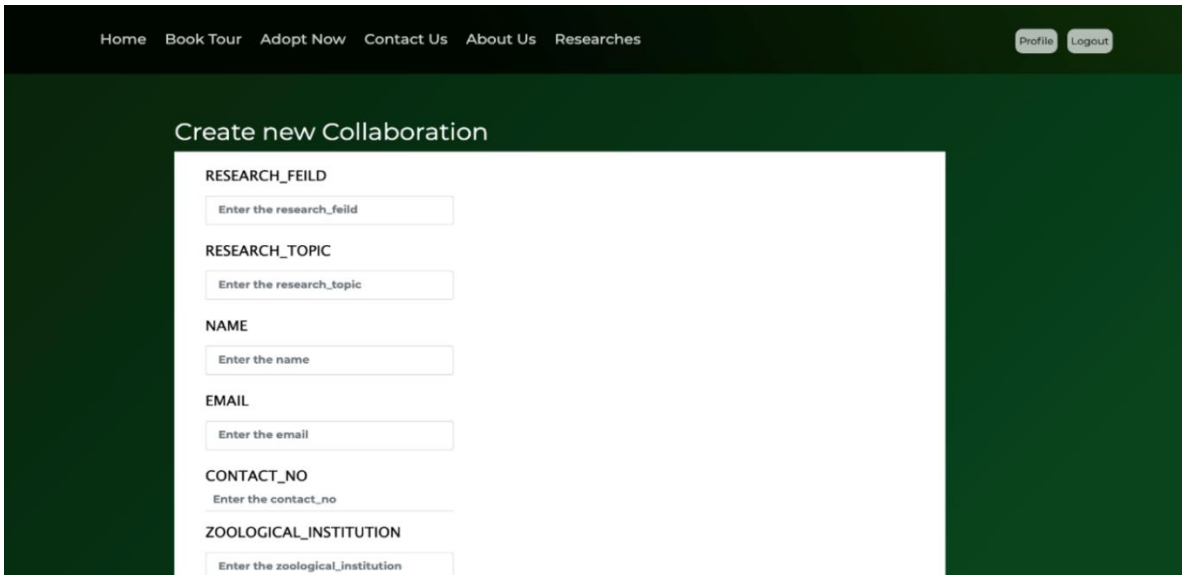


Figure 2.2.3.41: New Collaborations Page

2.3 Implementation

Tools:

- Visual Studio Code
- GitHub
- “Postman” [9]

Technologies:

Technology stack is mostly implemented front and backend-wise

Front-end technologies:

- “React”[3]
- HTML5
- “Bootstrap” [6]
- SCSS
- “Axios” [7]
- “React-Router” [8]
- “JsPDF” [5]

Back-end technologies:

- “Node Js” [4]
- “Express Js” [2]
- Database – “MongoDB” [1]

Implemented Algorithms:

- Searching Algorithm
- Indexing Algorithm
- Random ID generating Algorithm

2.4 Testing

Customer booking management

Test ID	Test Input	Expected Output	Actual Output	Result (Pass/Fail)	Description
01	Click on 'Submit Booking' with empty fields	Alert box pop up with error message	On click 'Empty fields aren't allowed' alert pops	Pass	Ensure customer enters every field in correctly to check form validation
02	Click on 'Request Booking' button in Navigation Bar	Request form open in a new page with user email & username prefilled fields	Form opens in browser displaying username and email pre-filled	Pass	When customer requests a booking form must display current logged in user details properly to make sure data integration is successful
03	Input invalid format email	Text conveying error in format	Validate method calls and display invalid format error	Pass	When inputting invalid format email form must
04	Update Booking without modifying details	Alert box showing with error message of no modification	Alert box pops with error 'No modifications done'	Pass	Make sure updating details are modified before updating
05	Click on 'Log out' button when in 'Tour	Current logged in user should be	User is directed to home page	Pass	Make sure that only the admin panel users can

	Guide Dashboard’	directed to home page after logging out	and user session is ended		access the ‘Tour Guide Dashboard’

Table 2.4.1: Customer Service Management Test Cases

Member Management

Test ID	Test Input	Expected Output	Actual Output	Result (Pass/Fail)	Description
1	Assign valid member first name, last name, email, username, and password	Display account registration success message	Account registration success message displayed	Pass	When click on the ‘Submit’ button, if an invalid email, username or password or keep the last name and first name fields empty, a relevant error message is displayed.
2	Email of an already registered user	Display account registration success message	Account registration success message displayed	Pass	When click on the ‘Submit’ button, if an email of an already registered user, a relevant error message is displayed.

3	When a valid email and password is entered in the login	Display Login Success message and redirecting to profile.	Display Login Success message and redirecting to profile.	Pass	When click on 'Login' button after inputting data, all details validate from database and display success message and login to member's account.
4	Click on the delete button to delete account	Display 'account deleted' message	Display 'account deleted' message	Pass	When clicked on 'delete account', account is deleted and redirected to main page.

Table 2.4.2: Member / Visitor Management Test Cases

Animal Adoption

Test ID	Test Input	Expected Output	Actual Output	Result (Pass/Fail)	Description
01	Click on 'Submit' with empty fields	Alert box pop up with error message	On click all empty fields checked and notified about each empty field	Pass	Ensure customer doesn't supply null value form

03	Update Booking without modifying details	Alert box showing with error message of no modification	Alert box pops with error 'No modificatio ns done'	Pass	Make sure updating details are modified before updating
04	Submit form with Member Id of logged user	Alert user if user is not logged in when user is going to adopt an animal	Redirecting to login in page if user is not logged in	Pass	Make sure that user is logged in when submitting an adoption form
05	Enter animal name with simple case letters	Show adoption records whether records are in simple or capital letter format	Display records whether they are in capital letter or simple letter format	Pass	Make sure that search method works on both capital letter and simple letter format

Table 2.4.3: Animal Adoption Test Cases

Employee Management

Test ID	Test Input	Expected Output	Actual Output	Result (Pass/Fail)	Description
01	Input employee details to create an employee record	Employee ID is auto generated and 1 incremented from the last employee ID on database	Employee ID is 1 incremented from last employee ID from database	Pass	Ensure employee ID is correctly generated
02	Input invalid email	relevant error message is displayed to the user	relevant error message is displayed to the user	Pass	Ensure the email entered is reasonable
03	Update user input	Alert box saying the update is successful when editing is successful	Alert box saying the update is successful when editing is successful	Pass	User friendliness Is improved by notifying the user
04	Clicking on generate report button	Report is generated and downloaded	Report is generated and downloaded	Pass	Make sure that the Report generation function is working as intended

Table 2.4.4: Employee Management Test Cases

Animal Management

Test ID	Test Input	Expected Output	Actual Output	Result (Fail/Pass)	Description
01	Auto generated ID when creating an animal	Animal ID is auto generated at the Dashboard	Auto generated Animal ID is a success.	Pass	When clicking on the 'CREATE' button of the Create Portfolio webpage an animal ID is auto generated for an animal.
02	Just Click On the 'CREATE' button of the Create Portfolio webpage	Popup appears showing an error, cannot submit empty fields.	An alert box appears when trying to submit with all empty fields.	Pass	Trying to submit a form with empty fields results in an error alert
03	In the 'RETREIVE' webpage, can see the relevant animal's medical records when clicking on a button setup	When clicking on the 'CHECK MEDICAL RECORDS BUTTON' can navigate to the relevant animal's medical records listed webpage	Proper navigation is present based on each animal's ID to their respective medical details' webpage.	Pass	Integration between Animal Management and Handling Medical Records Is Available.

	by integration.	based on the animal ID.			

Table 2.4.5: Animal Management Test Cases

Project Management

Test ID	Test Input	Expected Output	Actual Output	Result (Pass/Fail)	Description
01	Click on supervisor dropdown list	Show all supervisors using dropdown list, included in employee management function	Display all supervisors in employee management	pass	To find out the integration part with employee management working correctly
02	Click on working team dropdown list	Show predefined working groups with number of members	Display working teams with their available count of members	pass	To find out the integration part with member management working correctly
03	Type project name too short	Display validation error message 'Project name is too short'	Display error massage 'Project name is too short'	pass	To check the name validation, work properly
04	Click on submit button with completed form	Display successful message 'Project Created Successfully'	Display an alert box with successful message 'Project	pass	To check the Create function work properly

			created successfully'		
05	Click on Search Project button to retrieve all projects before entered	Display all the projects in database	Display all projects	pass	To check the retrieve part works properly
06	Click on Generate report button in Project Report page	Generate a report of selected project	Generated a report and downloaded through the web browser	pass	To find out the report generation function work properly

Table 2.4.6: Animal Management Test Cases

Medical Records Handling

Test ID	Test Input	Expected Output	Actual Output	Result (Pass/ Fail)	Description
01	Upload image	Display success message	Display success message	Pass	When click on the 'upload image' button after choosing any image, that image go to the unique folder and database and display success message
02	Click on 'add product' button	Error message showing 'Please filled mandatory fields'	Error message showing 'Please filled mandatory fields'	Pass	When add new product with empty fields. Then display error message

03	Fill all fields with valid character	Show success message	Show success message	Pass	When click on 'add new product' button after inputting data, all details go to the database and display success message.
04	Click on the delete button of the specific record that I want to delete	Display 'delete product' message	Display 'delete product' message	Pass	The specific product will be removed from the database and display 'delete product' message

Table 2.4.7: Medical Records Handling

Research Documents Handling

Test ID	Test Input	Expected Output	Actual Output	Result (Pass/Fail)	Description
01	Click on 'Submit collaboration 'by entering with an invalid email	Alert box pop with a error message	On click Alert box pop saying 'input a valid e mail	Pass	Ensure customer enters a valid email in given field to check form validation

02	Click on ‘Submit research ‘with empty felids	Alert box pop with an error message	On click Alert box pop saying ‘All inputs must be filled’	Pass	Ensure customer enters a valid information in given field to check form validation
03	Update Research without modifying details	Alert box showing with error message of no modification	Alert box pops with error ‘No modifications done’	Pass	Make sure updating details are modified before updating
04	Click on the delete button of the specific record to delete	Display ‘delete research’ message	Display ‘delete research message	Pass	The specific research will be removed from the database and display ‘delete research’ message
05	Enter a specific category name in capital letter format in search bar to view	Show research according to the given category which is in simple letter format	Displayed research according to the given category which is in simple letter format	Pass	When category is entered either in capital or simple letter format to check research It will show research which are belong to that given category

Table 2.4.8: Research Document Handling Test Cases

3. Evaluation

3.1 Assessment of the overall project outcome

- The aim of the project was to develop a properly integrated and implemented zoological management system to enhance the managerial capabilities of Zoo Melaka Organization. As a group are positive that have achieved the goal fulfilling the client's requirements as necessary.

3.2 Lessons Learned

- Acquired a good understanding about the administrative functions of a zoological organization.
- The value of teamwork and cooperation.
- Learnt to work and agree on a scope upfront.
- Gained a comprehensive knowledge about the proper implementation of MongoDB, Express, React, NodeJS, Postman, JavaScript, HTML, CSS, and Bootstrap technologies.

3.3 Future Works

- Improve User Interfaces and User-friendliness of the project implementation.
- Improve upon the existing project to assist Zoo Melaka Organization in their future endeavors.

4. Conclusion

Zoo Melaka Management systems ensures visitors and members to get a better experience and make their bookings & adoptions, Overall helps manage bookings and adoptions.

In addition, system helps Zoo Melaka staff to manage Employee Management, Member Management, Project Management, Animal Portfolio Management, Medical Records Handling, Research Management, Adoption Management and Customer Service Management. The important aspect is data accessibility is given for the specialized persons. All the data collecting from User Interfaces are stored in a database. Each function has a table contains all the records according to related function. Admin panel users can generate relevant report for documentation purposes, each function contains a generated report which is based on the functionality of the management purpose. Admin panel can analyze data using these reports easily. Visitors/members can download their receipts using generate receipt function. Furthermore, data integration between above mentioned functions is more drastic therefore applying references to each function related collection from the Zoo Melaka database is highly encouraged & suited to apply.

5. References

[1] “MongoDB” [online]. Available: https://docs.mongodb.com/

[2] “Express” [online]. Available: https://expressjs.com/en/5x/api.html

[3] “React” [online]. Available: https://reactjs.org/docs/getting-started.html

[4] “Node” [online]. Available: https://nodejs.org/en/docs/

[5] “JSPDF” [online]. Available: https://artskydj.github.io/jsPDF/docs/jsPDF.html

[6] “Bootstrap” [online]. Available: https://getbootstrap.com/docs/4.1/getting-started/introduction/

[7] “Axios” [online]. Available: https://axios-http.com/docs/intro

[8] “React-Router” [online]. Available: https://reactrouter.com/web/guides/quick-start

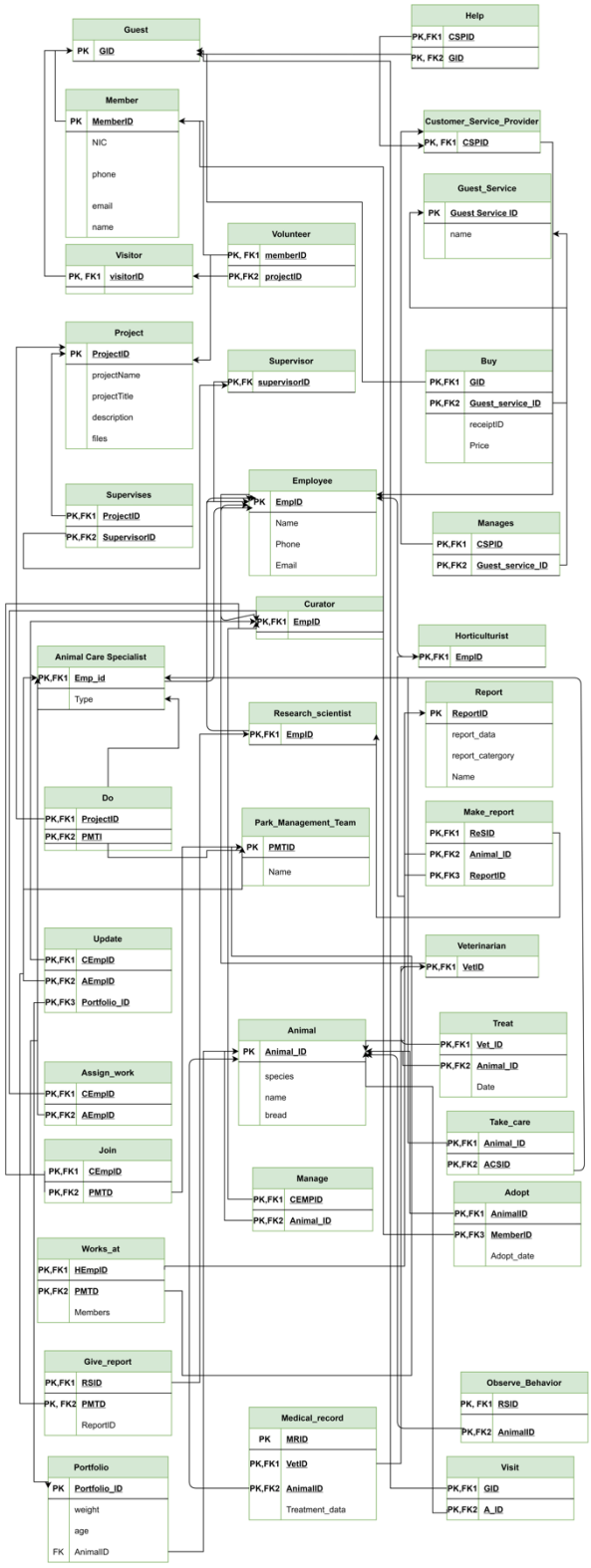
[9] “Postman” [online]. Available: https://learning.postman.com/docs/getting-started/introduction/

[10] “w3Schools” [online]. Available: https://www.w3schools.com/

[11] “YouTube” [online]. Available: https://www.youtube.com/

[12] “Stack Overflow” [online]. Available: https://stackoverflow.com/

Appendix A: Design Diagrams



Appendix B : User Documentation

README.md

Zoo Management System for Zoo Melaka Organization

Getting Started :

1. Fork the repository.
2. Clone the repository.

```
git clone <https://github.com/ChathushkaRodrigo/ZooMelaka-Management-System.git>
```

3. Move to the Frontend.

```
cd frontend
```

4. Intall the necessary npm packages of Frontend.

```
npm install
```

5. Move to the backend.

README.md

5. Move to the backend.

```
cd ..
```

and then,

```
cd backend
```

6. Intall the necessary npm packages of Backend.

```
npm install
```

7. Run the app in the development mode.

```
npm run dev
```

To view it in the browser, Open,

README.md

To view it in the browser, Open,

```
Open http://localhost:3000
```

The page will reload if you make edits and save.

Contributing Changes

1. Before Making any contribution fetch and Merge the repository
2. Create Feature branch and checkout Replace <BRANCH_NAME> with meaningful name. For an example navbar. See the guide for the more details Link

   Link

   ```
   git checkout -b feature/<BRANCH_NAME>
   ```

3. Do Your Modifications.
4. Stage Changes and commit.

   ```
   git add .
   ```

README.md

4. Stage Changes and commit.

   ```
   git add .

   git commit -m "<Commit message>"
   ```

5. Push Changes

   ```
   git push --set-upstream origin feature/<BRANCH_NAME>
   ```

6. Make a Pull Request. See the guide for more details

   Link

Technologies :

- Mongodb
- Express js
- React js
- Node js

```
DB_URL =mongodb+srv://ZooDatabaseAdmin:melaka123@zoo-managment-system-cl.lbmt4.mongodb.net/ZooManagementSystem?
```

README.md

```
git add .

git commit -m "<Commit message>"
```

5. Push Changes

```
git push --set-upstream origin feature/<BRANCH_NAME>
```

6. Make a Pull Request. See the guide for more details

   Link

Technologies :

- Mongodb
- Express js
- React js
- Node js

`DB_URL =mongodb+srv://ZooDatabaseAdmin:melaka123@zoo-managment-system-cl.lbmt4.mongodb.net/ZooManagementSystem?retryWrites=true&w=majority`