SCSJ2203: Software Engineering

PRJ2: Requirements Specification and Analysis

UTM Alumni Integrated System (ALIS)

Version 1.0

Software Engineering/ School of Computing

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Revision Page

a. Overview

The current version of this document mainly describes the introduction, specific requirements, design constraints and other requirements of the system. The introduction part contains purpose, scope, definitions, acronyms, abbreviations, references and overall functionalities of the system. System use case diagram is introduced to present the overall functionalities of the system. The class diagram and state diagram are included in the specific requirements section of this document. In that section, use case specifications, sequence diagram and activity diagram were constructed and documented for each use case.

b. Target Audience

The intended audiences of this documentation include the stakeholders (project manager), system analyst and the programmer.

c. Project Team Members

List the team members and respective assigned use case.

Team Member	Assigned use case
MOAID MOHAMED ABDELMONEIM MOHAMED ELHEFNY	2.1 Manage membership 2.2 Give endowment fund & donation 2.13 Arrange Payment
WONG EN SING [Leader]	2.3 View report and statistics 2.7 View event 2.9 Manage event

	2.10 View Industrial linkages 2.11 Manage Industrial linkages
NAZMUS SAKIB	2.4 Create report and statistics 2.5 Search alumni 2.12 Select Payment Method
MUHAMMAD JASIM BIN MOHD MOHIDEEN	2.6 Reserve facility 2.8 Register event 2.13 Arrange Payment

d. Version Control History

Version	Primary Author(s)	Description of Version	Date Completed
<Current Version>			

Note:
This Requirements Specification and Analysis template is customized to meet the need of SCSJ2203 course at Faculty of Computing, UTM. Compiled and checked by Shahliza Abd Halim, 9th March 2017. Examples of use case description and models are from Satzinger (2011).

Table of Contents

1. Introduction

1.1 Purpose

The aim of this requirement specification and analysis document is to describe the proposed model of the computerized UTM Alumni Integrated System(ALIS) which includes its overall system functionalities, specific requirements, performance requirements, design constraints and other requirements. The specific requirements are presented by using use case specification which shows the normal flow and alternative flow of carrying the tasks, sequence diagram and activity diagram for the specific use case. This document is intended for stakeholders to review the proposed system and understand more about the functionality of the system.

1.2 Scope

The software product to be produced is UTM Integrated Alumni System (ALIS). The main purpose of ALIS system is to connect people who is not only from UTM but also associated members like graduates of twinning programs with UTM, non-UTM alumni lecturer, individual that had covenant with UTM and others across the world. The importance of the alumni system is network. The main purpose of this system is to create an engaged, supportive alumni network which is crucial to an institution’s success.

Good alumni relationships bring many benefits to both the institution and the alumni. Alumni relations is an important part of an institution's advancement activities for various reasons: Alumni are an institution's most loyal supporters. Alumni are great role models for current students and are often well placed to offer practical support to students as they start their careers. Among the functions of alumni are supporting the UTM in terms of monetary funds and giving help in terms of time and support for the next generation students in UTM. Giving back to UTM will help in terms of scholarships, new facilities etc.

The client requires the system or the software because they want all the alumni members get involved and connect with each other through the alumni integrated system. They want us (current UTM students) to improve the existing UTM Alumni system which

provides the user access to large alumni community, to be user-friendly and connecting with the industrial networks with the reference of UTM.

The objectives of the proposed improved system are as follows:

i. Operational efficiency - Improve the operational efficiency by improving the quality of the process by enabling data integration from various sources such as SRAD, UTMSPACE etc.

ii. Cost cutting - Reduce the cost involved in the alumni process including manpower

iii. Income generation – Support UTM activities by contributing back to the university via UTM Alumni Endowment Fund

iv. One stop platform – Being a platform for all alumni from all over the world to connect and establish relationship and networking

The main goal of the proposed system is to improve and upgrade the current Alumni system. These are some of the higher-level specifications collected from our stakeholders:

i. Efficient membership management: allow data integration from various sources such as SRAD and UTMSPACE without data duplication.
ii. Accurate and user-friendly activity management
iii. Easy facility reservation
iv. Comprehensive report & statistics:
v. Convenient endowment & donation management
vi. Inter-industrial management
vii. Effective news distribution: alumni can retrieve and even share latest news with UTM and with alumni and vice versa, including sharing on social media platforms such as Facebook, Instagram and Twitter

1.3 Definitions, Acronyms and Abbreviation

1. Activity diagram: A graphical representation of an executed set of procedural system activities and considered a state chart diagram variation. Activity diagrams describe parallel and conditional activities, use cases and system functions at a detailed level.
2. Associated Members: Graduates of twinning programs with UTM, Non-UTM Alumni lecturer and Individual that had covenant with UTM (by invitation)

3. Class diagram: A type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations or methods, and the relationships among objects.
4. Endowment: an income or form of property given or bequeathed to someone.
5. Goal model: A conceptual model that document goals, their decomposition into sub-goals and goal dependencies.
6. Sequence diagram: A diagram that shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario.
7. SIG: Special Interest group in UTM ALIS with mutual interest or shared characteristic.
8. Swimlane diagram: A type of flowchart that delineates who does what in a process and is used to have a clearer view on all the processes involved in the system. It can serve to highlight waste, redundancy and inefficiency in a process.
9. UTM ALIS: Universiti Teknologi Malaysia Alumni Integrated System is a product that creating an engaged, supportive alumni network among UTM alumni and integrated all alumnus information.
10. UTM Alumni: Graduates from Technical School, Technical College, National Technology Institutes (ITK) and in UTM varies form Certificate up till Doctorate level.
11. UTMSmart: Mobile application developed by CICT UTM as an initiative of digital campus lifestyle at UTM, to provide services which complement and facilitate the needs of students, staffs and even visitors.
12. UTMSPACE: Universiti Teknologi Malaysia School of Professional and Continuing Education
13. UTM SRAD: Universiti Teknologi Malaysia Student Recruitment & Admission.

1.4 References

1. Elicitation Workshop UTM-ALIS. Retrieved from: https://trello.com/b/lL0nJ7tQ/elicitation-workshop-utm-alis
2. H. Gomaa, Software Modeling and Design: UML, Use Cases, Patterns, and Software Architectures. New York, USA: Cambridge University Press, 2011.
3. K. Pohl and C. Rupp, Requirements Engineering Fundamentals, 1st edition. CA, USA: Rocky Nook, 2011

4. K. Wiegers and J. Beatty, Software Requirements, 3rd Edition. Washington: Microsoft Press, 2014.
5. Udit Agarwal (20012), “Software Engineering”, 1st Edition, S. Kataria and Sons, India.
6. UTM Alumni Liaison Unit. (20th May 2014). Retrieved from http://alumni.utm.my/content/post/view/id/9/s/corporate-profile.
7. UTM Alumni. Retrieved from: http://alumni.utm.my/
8. UTM alumni workshop.
9. Sommerville, 2010. “Software Engineering”, 9th Edition, Addison Wesley.
10. Tsui, F. and Karam, O., (2011), “Concise Guide to Software Engineering: From Fundamentals to Application Methods”, Springer, USA.Online

1.5 Overall System Functionalities

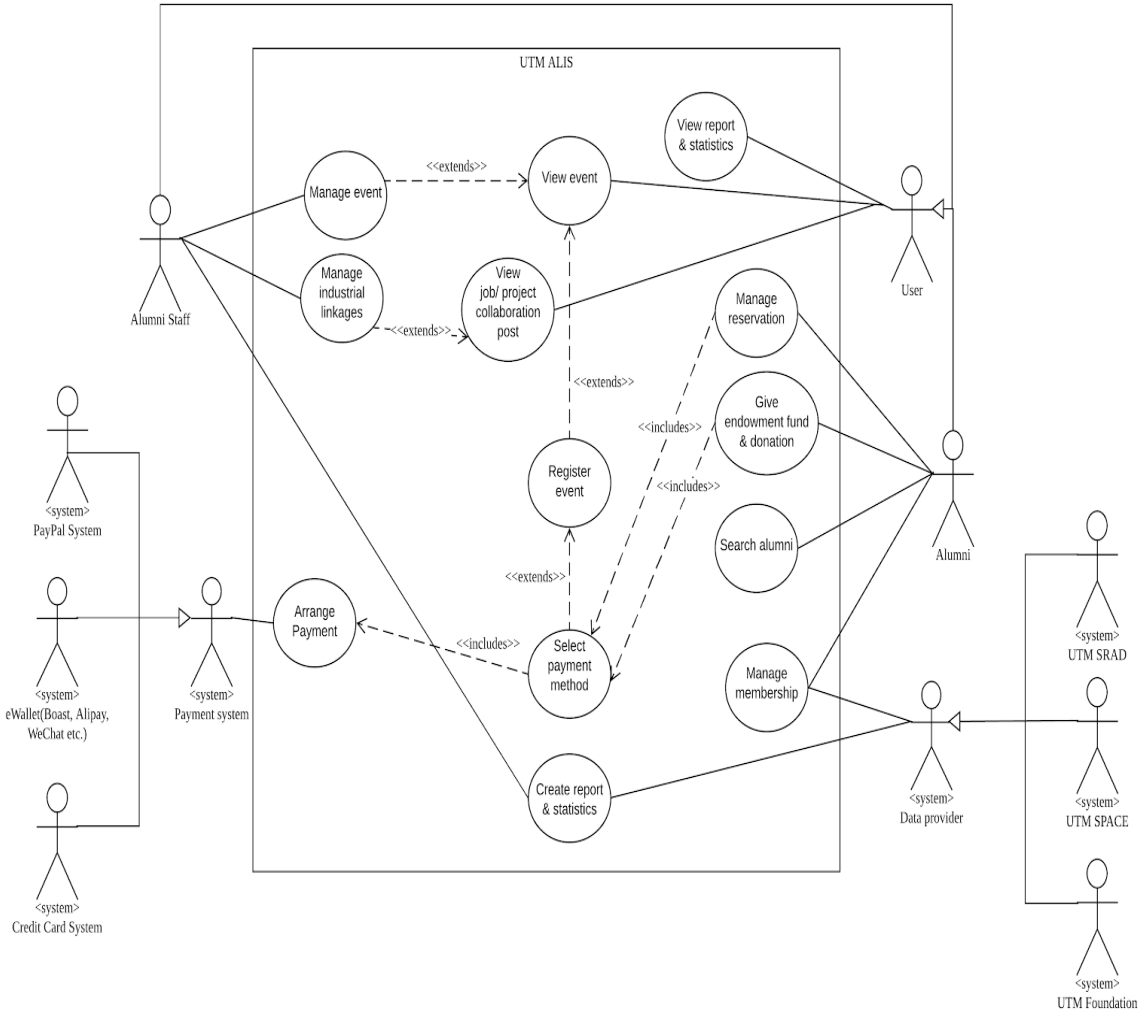

Figure 1.1: Use Case Diagram of UTM ALIS

2. Specific Requirements

1. Functional Requirements

Index	Description	Priority	Use case
FR01	**The system shall provide user the ability manage personal profile.**	SHALL	UC001
FR02			
FR03			
FR01	The system shall provide alumni staff the ability to create report and statistics	SHALL	UC004
FR02	The system shall provide alumni the ability to search for other alumnis	SHALL	UC005
FR03	The system shall provide alumni the ability to select payment method	SHALL	UC012
FR01			
FR02			
FR03			

4.1 System provide many options to make payment and donation.

User shall be able to make payment and donation through many options such as online banking, debit card etc.

4.2 User shall able to manage personal profile.

User shall be able to create and edit own profile. They also will have the option to display profile picture, customise their wall and view other users' profile.

4.3 The system shall verify users.

The system should verify users by their username and password and determine whether it is alumni, student, or staff.

4.4 The system shall send notification to users.

The system shall notify users about upcoming event and new posts in forum. there will be an option for users to send notification to all users personally call broadcast message.

4.5 Users shall be able to post and modify posts in forum.

The system will provide options to add, update and delete posts in forum depending on their account type.

4.6 Users shall be able to make facility reservation via the system

The users can make new booking application, review online booking and view payment information.

4.7 UTM Board of Management & UTM staff shall be able to view report & statistics

The report & statistics include Graduate Employability Report, Fundraising Report, Activity Report and Profit reservation facility report.

4.8 The System shall provide Industrial network linkages

Industrial shall be able to post job / research collaboration and receive new registration application from users. Users shall be able to view and apply for available job / research collaboration.

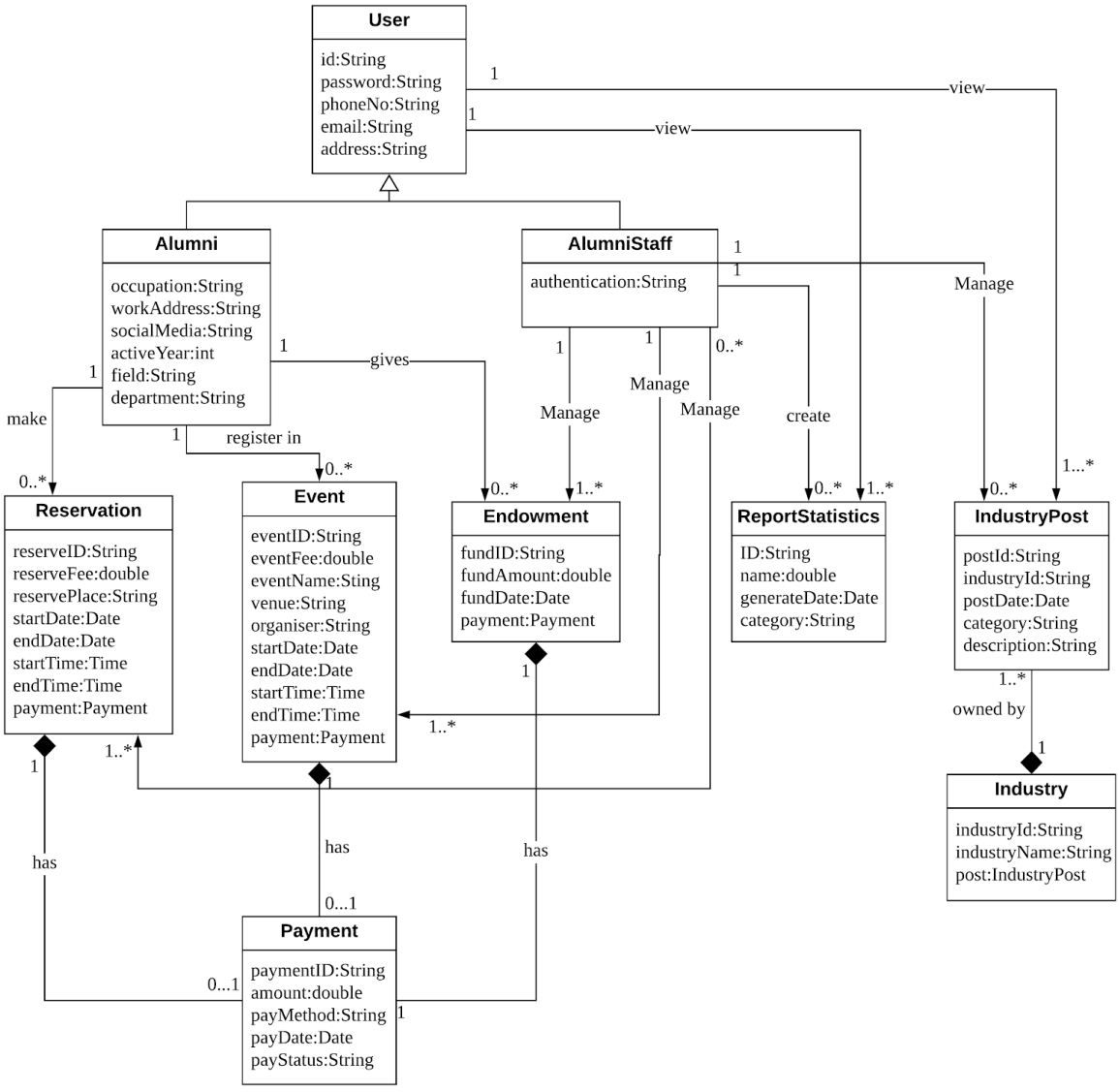

Figure 2.1: Domain Model of <UTM ALIS>

1. User class

The user class consists of the id and password attributes and some compulsory personal info from user which are phone number, email and address. The id attribute is for the user account identification purpose and password is for the user account to login.

The following classes are specialized classes inherited from the User class.

- **Alumni**

  Alumni class inherits all the attribute from the User parent class. The attribute of this class is occupation, workAddress, socialMedia, activeYear, field and department which is the occupation of Alumni, the current working address , the link to their social media account such as Twitter, Facebook, Instagram etc., their active years, the field the alumni was active in UTM(Course studied for graduated students or past occupation in UTM for staff), department the alumni was in respectively.

- **Alumni staff**

  Alumni staff class inherits all the attribute from the User parent class and has it owns authentication attribute for account identification when login and access in the system.

2. Reservation

Reservation class consists of the details of facility reservation when alumni make a facility reservation. The attributes included are:

i. reserveID: An unique reservation ID
ii. reserveFee: The cost of reservation
iii. reservePlace: The facility/ place to be reserved
iv. startDate: Starting date
v. endDate: Ending date
vi. startTime: Starting time

vii. endTime: Ending time

viii. payment: The instantiation of class Payment which record the payment details.

3. Event

Event class consists of the details of events. The attributes included are:

i. eventID: An unique event ID

ii. eventFee: The registration fee of the event

iii. eventName: The name of the event

iv. venue: The venue which the event to be held

v. startDate: Starting date

vi. endDate: Ending date

vii. startTime: Starting time

viii. endTime: Ending time

ix. payment: The instantiation of class Payment which record the payment details.

4. Endowment

Endowment class consists of the details of endowment fund/ donation donated by the alumni. The attributes included are:

i. fundID: An unique fund ID

ii. fundAmount: The amount of donation

iii. fundDate: The date which the donation initialized.

iv. payment: The instantiation of class Payment which record the payment details.

5. Payment

Payment class consists of the details of payment, which is instantiated when alumni need to pay something through the system. The attributes included are:

i. paymentID: An unique payment ID

ii. amount: The amount of payment

iii. payMethod: The payment method chosen by alumni, which might be PayPal/online banking,/credit card/eWallet.

iv. paymentDate: The date which the donation initialized.

v. payStatus: The status of the payment, which might be success/pending/fail.

6. ReportStatistics

ReportStatistics class consists of the details of Report or Statistics, which is generated by alumni staff according to need. The attributes included are:

i. ID: An unique ID of the report or statistics

ii. name: The name of the report or statistics

iii. generateDate: The date which the report or statistics generated..

iv. category: The category which the report or statistics belongs to.

7. IndustryPost

IndustryPost class consists of the details of Report or Statistics, which is generated by alumni staff according to need. The attributes included are:

i. postID: An unique ID of the job/project collaboration post

ii. industryId: The ID of the industry, the owner of this post

iii. postDate: The date which the job/project collaboration post posted.

iv. category: The category or field of job which the job/project collaboration post belongs to.

v. description: The detailed description for the job/project.

8. Industry

Industry class consists of the details of the industry, who own the job/project collaboration post. The attributes included are:

i. industryId: The ID of the industry, the owner of this post

ii. industryName: The name of the industry

iii. post: The instantiation of class IndustryPost which record the job/project collaboration post details.

Relationships between classes is shown clearly in the domain model.

2.1 UC001: Use Case Manage Membership

Use Case	Manage membership
ID	UC001
Brief description	Controlling alumni membership by the user and having access to update alumni user personal info such as address, phone number…etc.
Actors	Alumni, Data provider (UTM SRAD, UTM space and UTM foundation)
Related use case	-
Pre-conditions	● There is an active membership for the user. ● There is full personal information for the user provided in his membership. ● The alumni user has successfully logged into the system.
Normal Flow	1. The use case begins when alumni system merge data from different sources such as SRAD, UTM space etc.. 2. The user fills his IC/matric card. 3. The system ensures is the user is UTM member or not by checking the IC number of the user from the Alumni database. 4. If No, go to Exception 1. 5. If Yes, system retrieve all information about the user from the merged database and display it to the user in an editable form. 6. User updates his personal info and add password. 7. User click on update form button.

	8. System store the updated information of the user in database.
Alternative Flow	-
Exception	1. User IC/matric card number is not found in the databases, system display “user not found” message and go back to Normal Flow 2.
Related Requirement	-
Post-Conditions	Successful updating info ● The updated personal information is successfully updated and stored in the system database.

Table 2.1: Use Case Specification for <Manage membership>

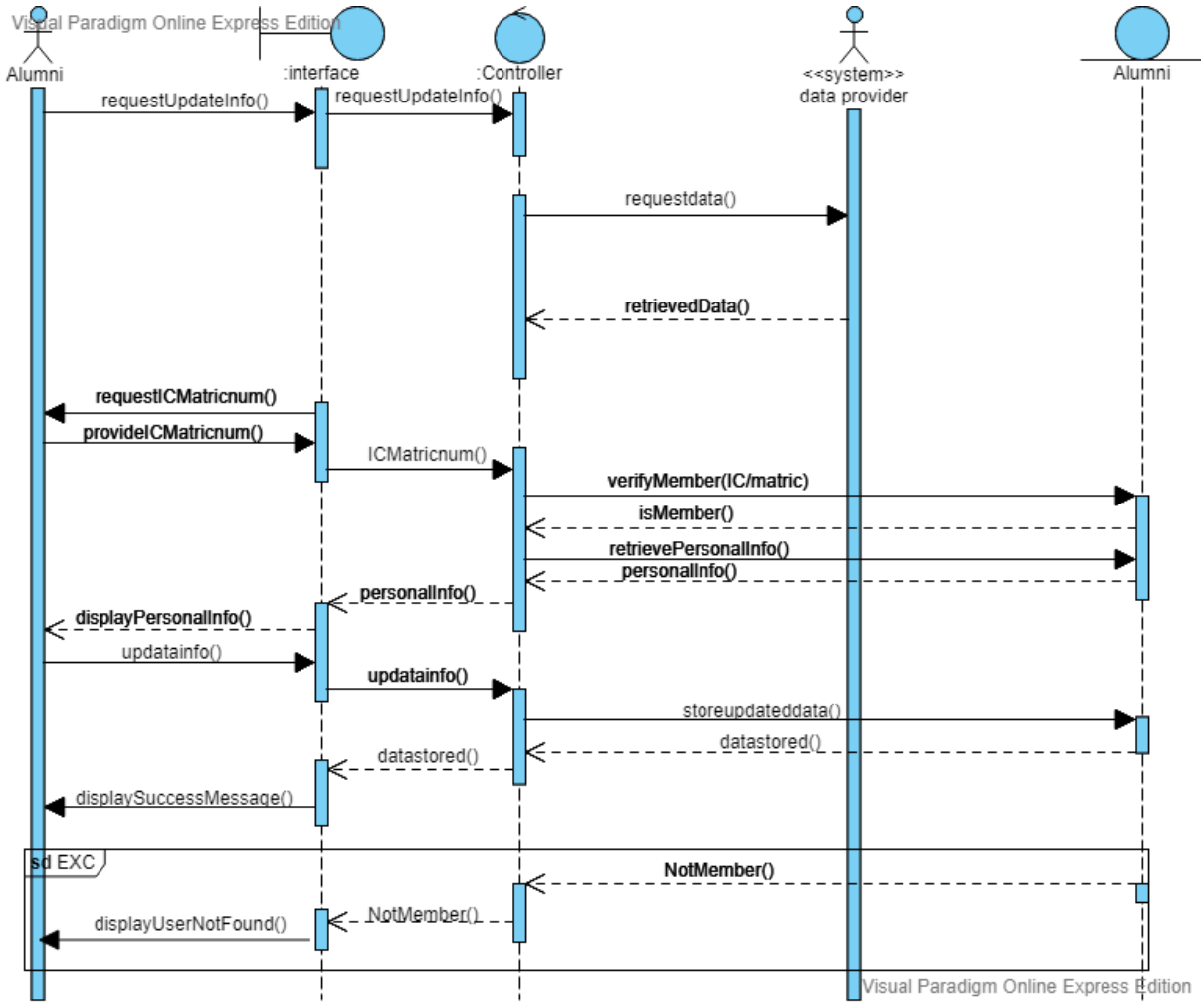

Figure 2.1: Sequence Diagram of <Manage membership>

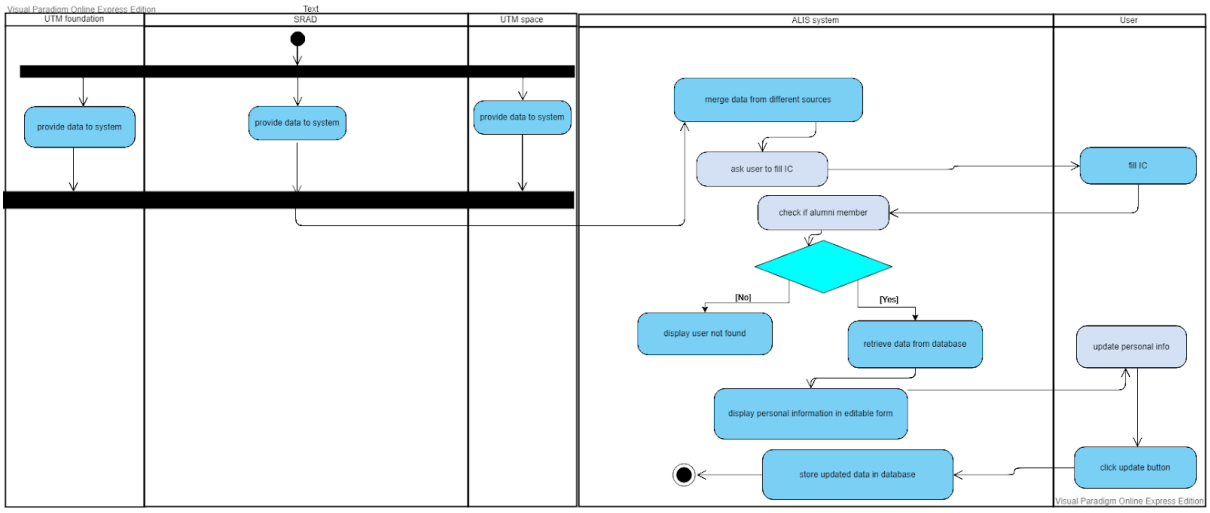

Figure 2.2: Activity Diagram of <Manage membership>

2.2 UC002: Use Case Give endowment fund & donation

Use Case	Give endowment fund & donation
ID	UC002
Brief description	Alumni contribute to UTM activities through UTM Endowment fund and allow Alumni to donate.
Actors	Alumni
Related use case	UC012, UC013
Pre-conditions	The alumni user has successfully logged into the system.
Normal Flow	1. The use case begins when alumni fill his personal information and complete the form. 2. Proceed to use case UC012 to choose payment method. 3. Proceed with use case UC013 to complete payment. 4. System transfer the donation to Endowment fund. 5. System notify alumni successful payment.
Alternative Flow	-
Exception	-
Related Requirement	-
Post-Conditions	Successful transaction operation · The transaction has been successfully done and donation transferred to Endowment fund.

Table 2.2: Use Case Specification for <Give endowment fund & donation >

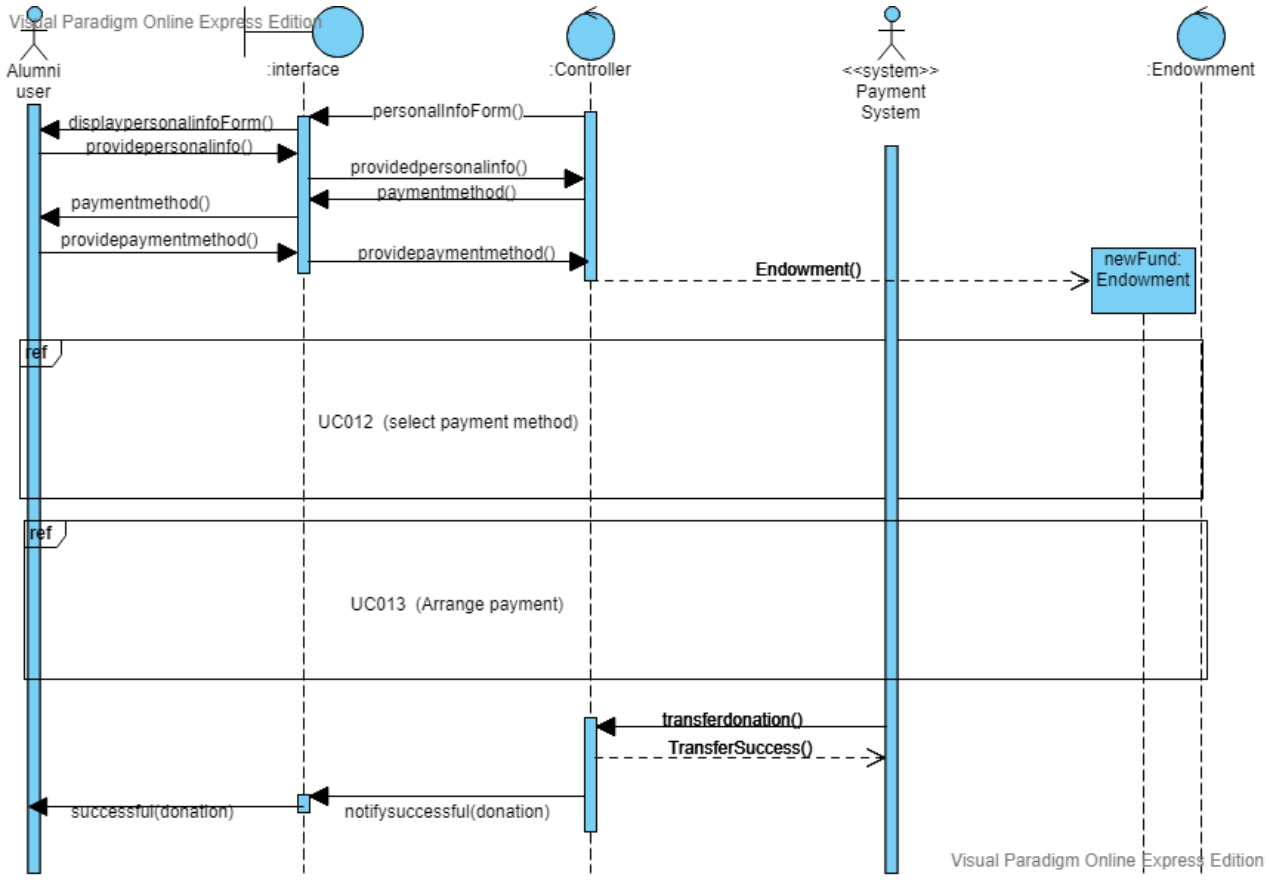

Figure 2.3: Sequence Diagram of <Give endowment fund & donation >

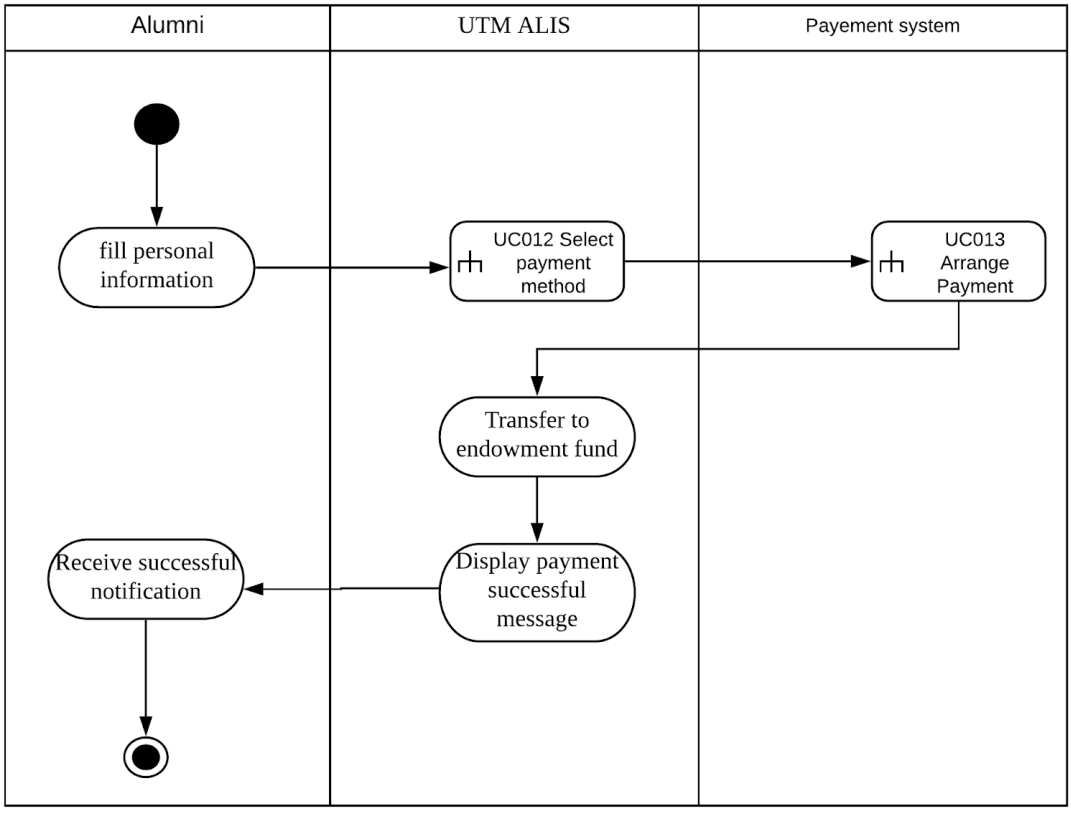

Figure 2.4: Activity Diagram of <Give endowment fund & donation >

2.3 UC003: Use Case View report and statistics

Use Case	View report and statistics
ID	UC003
Brief description	Alumni staff and alumni can view the existing report & statistics.
Actors	User (alumni staff or alumni)
Related use case	-
Pre-conditions	• There is an active network connection to the platform.

	• The user has successfully logged into the system. • There exists at least one report & statistics to be shown.
Normal Flow	1. The use case begins when the alumni staff clicks on the tab “report & statistics”. 2. The system displays list of report and statistics. 3. If user wish to see the details of a particular report and statistics, Alternative Flow 1 is performed. 4. The use case ends.
Alternative Flow	1. See the report and statistics details 1.1. User clicks on the particular event. 1.2. System retrieve and display the event details. 1.3. If user click on the “Back” button on the right bottom of the page, back to Normal Flow 2.
Exception	-
Related Requirement	-
Post-Conditions	Successful Completion • The report and statistics is successfully displayed. The users may proceed with other operations.

Table 2.3: Use Case Specification for <View Report and Statistics>

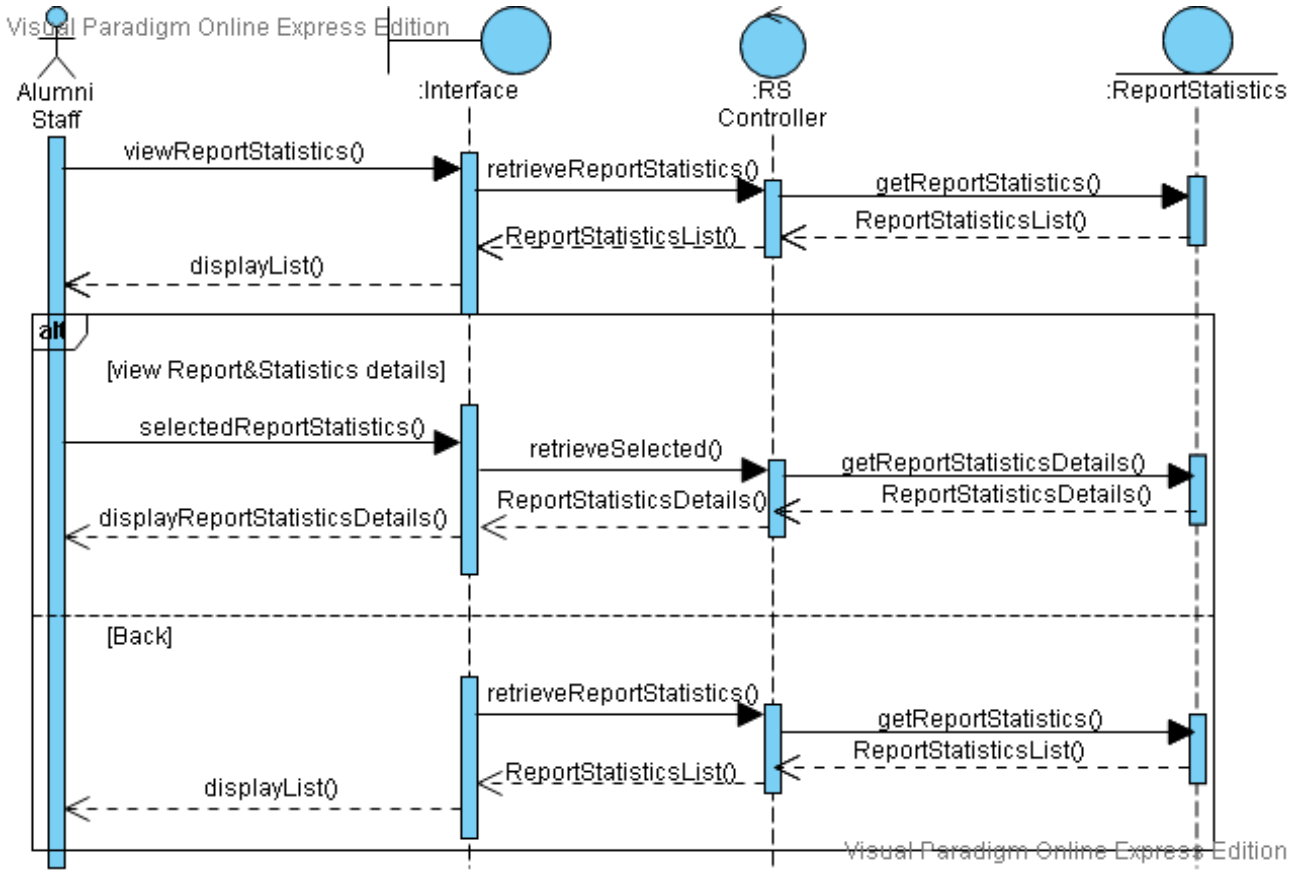

Figure 2.5: Sequence Diagram of <View Report and Statistics>

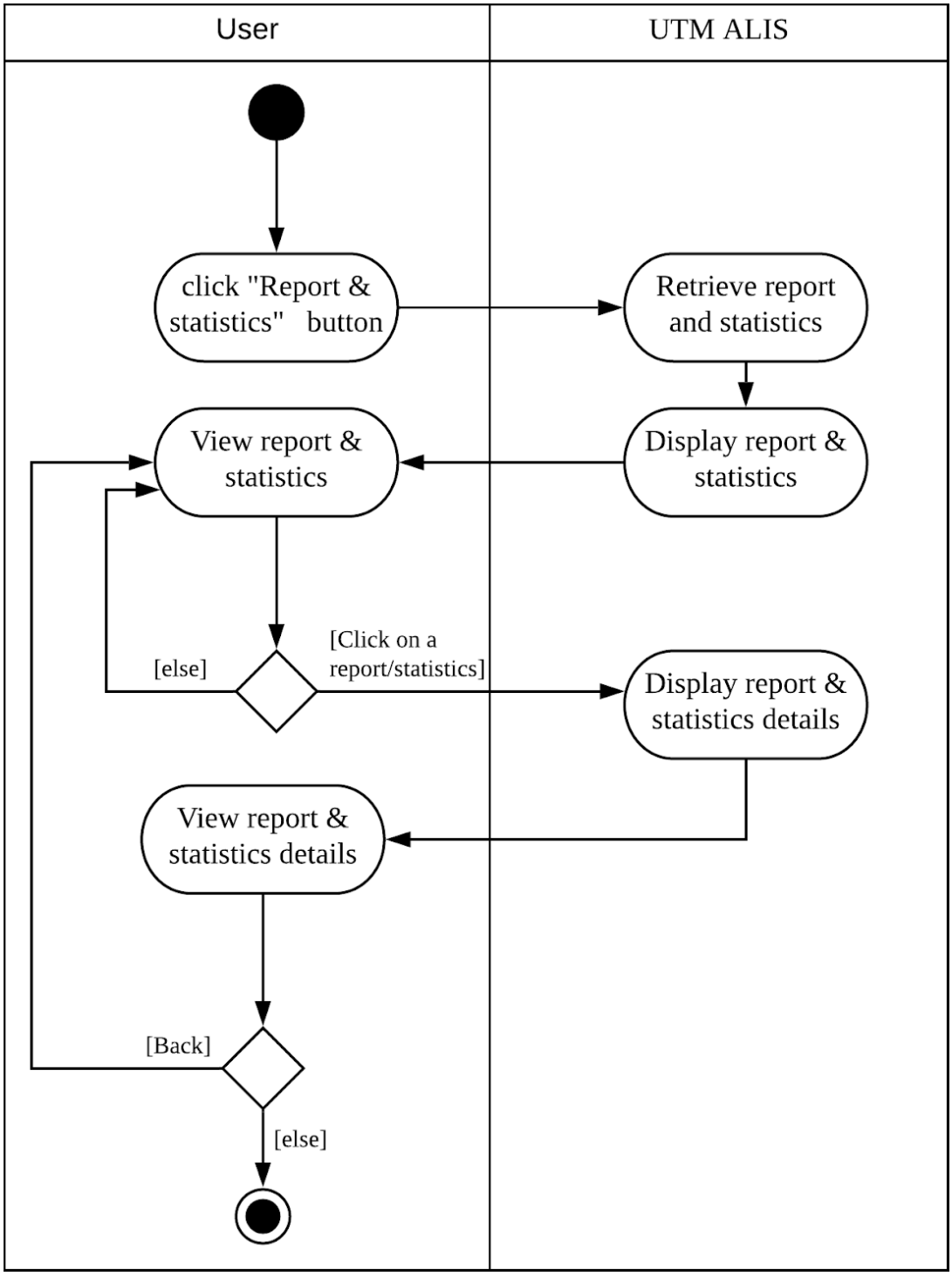

Figure 2.6: Activity Diagram of <View Report and Statistics>

2.4 UC004: Use Case Create report & statistics

Use Case	Create Report and Statistics
ID	UC004
Brief description	The system admin gathers the data and merges it to create report and statistics.
Actors	Alumni Staff, Data provider (UTM SRAD, UTM space and UTM foundation)
Related use case	-
Pre-conditions	1. Registered User 2. A stable network connection. 3. Proper and precise information of alumni and faculty. 4. The user has successfully logged into the system.
Normal Flow	1. The admin request access to the database of the system. 2. If the request is not granted, Alternative Flow 1 is performed. 3. The admin retrieves the latest data from the system. 4. The admin creates the report and update into the database. 5. System admin collects the reviewed report and update them on ALIS system. 6. The use case ends when the admin logs out of the system.
Alternative Flow	1. Request not granted for accessing the database. 1.1 The system displays the request is not granted. 1.2 The system reloads the page. 1.3 Tells the admin to request again.

Exception	-
Related Requirement	-
Post-Conditions	System admin displays the report on the main page for reviewing.

Table 2.4: Use Case Specification for <Create Report and Statistics>

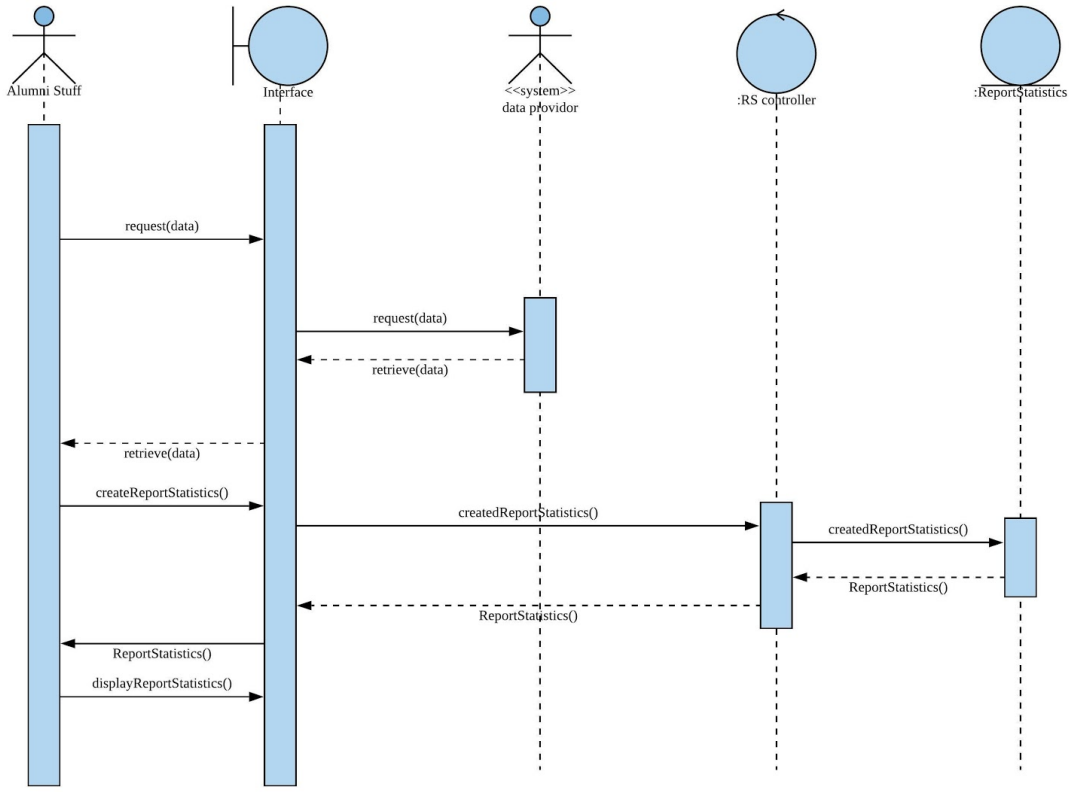

Figure 2.7: Sequence Diagram of <Create Report and Statistics>

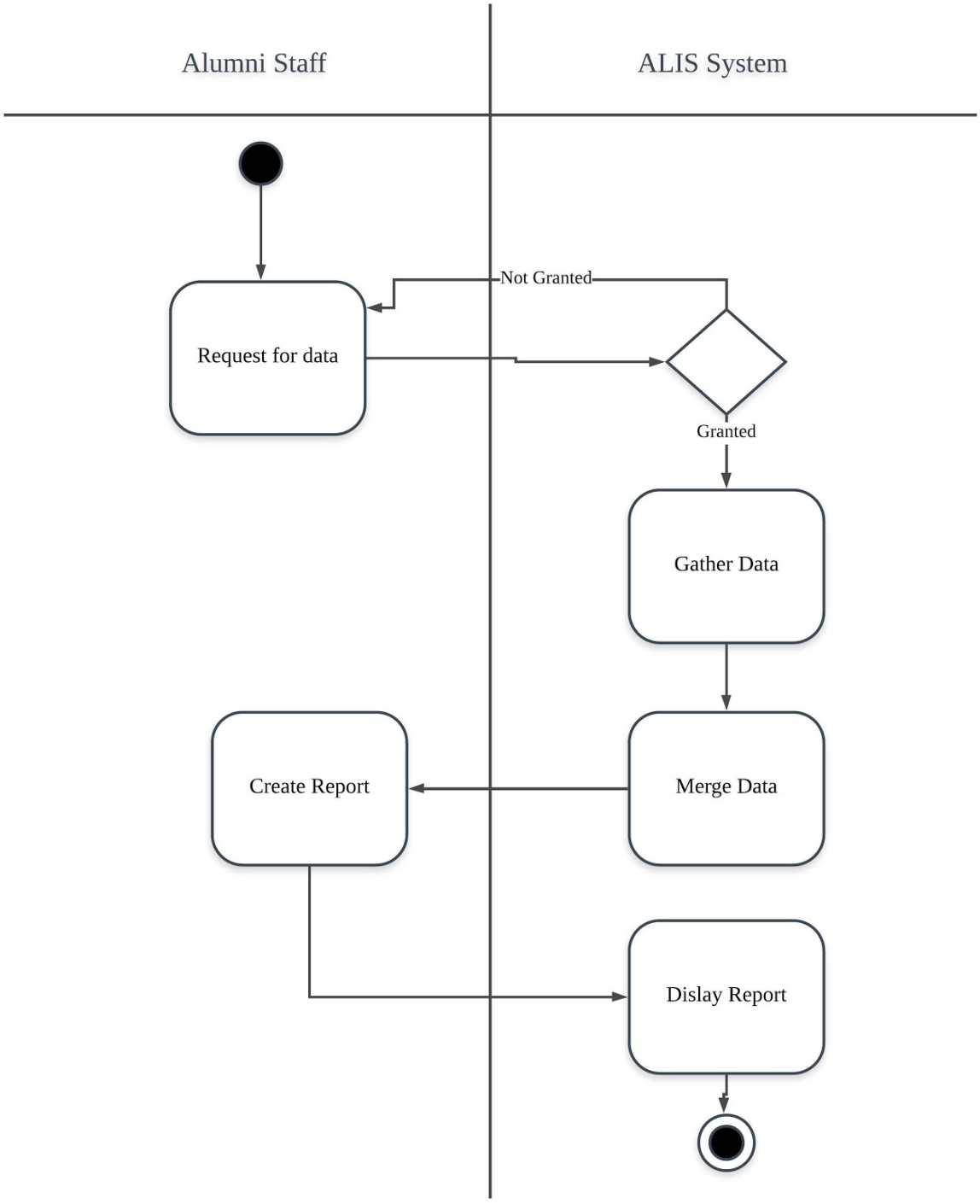

Figure 2.8: Activity Diagram of <Create Report and Statistics>

2.5 UC005: Use Case Search alumni

Use Case	Search Alumni
ID	UC005
Brief description	Alumni looks for other alumni in the system by interest group or by name.
Actors	Alumni
Related use case	-
Pre-conditions	• There is an active network connection to the platform. • The alumni have successfully logged into the system. • Valid search information has been entered
Normal Flow	1. The use case begins when the alumni clicks on the tab “Find a friend”. 2. The system Prompts the search page 3. If user wish to search by name, Alternative Flow 1 is performed. 4. If the user wishes to search by interest group, Alternative Flow 2 is performed. 5. The system displays the latest list alumni. 6. The user clicks on the name or profile they were looking for. 7. The system displays information about the searched alumni. 8. The use case ends.
Alternative Flow	1. Search by name 1.1. the user input the name in the field provided for name. 2. Search by interest groups 2.1. The user provides the interest group description or name in the field provided for search by groups.

Exception	Failure Conditions • If the internet connection is disrupted, the system has a fixed duration to recover, otherwise alert will be shown to users if the recovery process failed.
Related Requirement	-
Post-Conditions	-

Table 2.5: Use Case Specification for <Search Alumni>

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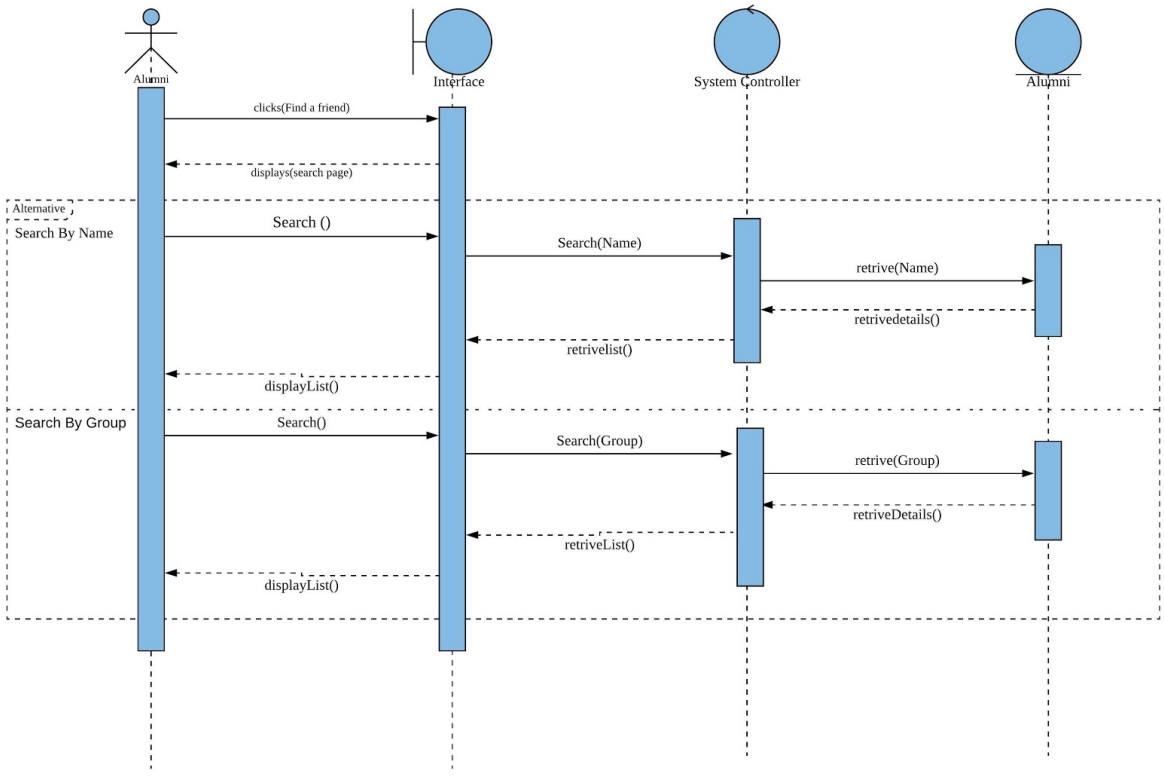

Figure 2.9: Sequence Diagram of <Search Alumni>

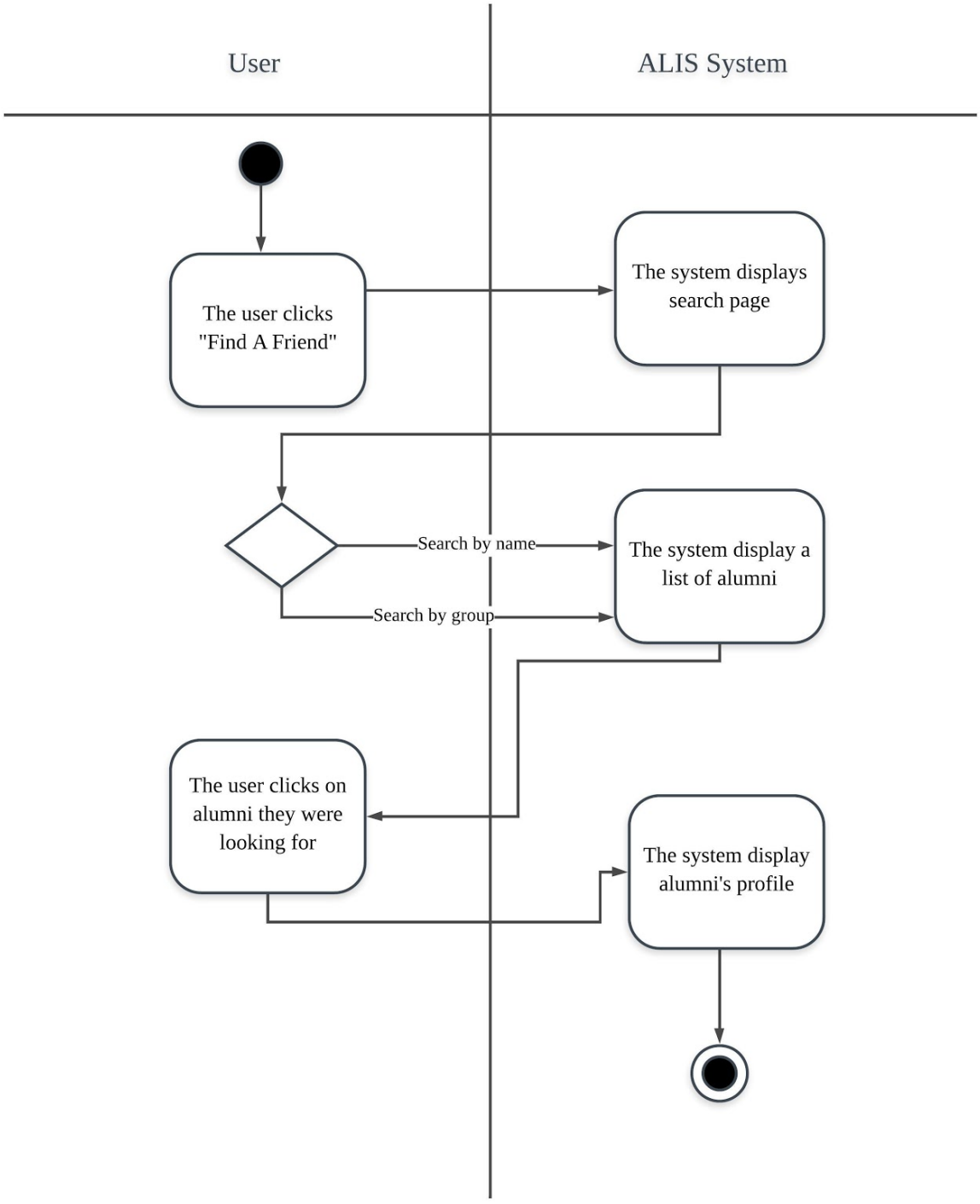

Figure 2.10: Activity Diagram of <Search Alumni>

2.6 UC006: Use Case Reserve facility

Use Case	Reserve Facility
ID	UC006
Brief description	Alumni reserve facility in UTM such as multipurpose hall and other facilities.
Actors	1. Alumni
Related Use Case	1. UC012
Pre-conditions	-
Normal Flow	1. The use case begins when the alumni clicks on the tab “Facility Reservation”. 2. If the user clicks “Reserve Facility”, Alternative Flow 1 is performed. 3. If the user clicks “Check Reservation”, Alternative Flow 2 is performed.
Alternative Flow	1. Reserve Facility 1.1 User selects facility to reserve 1.2 Checks date & time availability for the selected facility 1.3 Choose type of package based on event 1.4 User enters credentials 1.5 The system ensures the entered credentials are valid. 1.6 If not, Exception 1 is performed. 1.7 If yes, system store all the information about the facility reservation in Alumni Reservation Database and display a successful message to the user. 1.9 System sends a confirmation email to user email based on the credentials entered. Use case ends. 2. Check reservation

	2.1 User enters credentials to login to the system. 2.2 The system ensures the entered credentials are valid. 2.3 If not, Exception 2 is performed. 2.4 If yes, user will update the reservation details. 2.5 The system ensures whether the user have made the payment for the reservation. 2.6 If yes, Alternative Flow 1.8 performed. 2.7 If no, use case UC0012 is performed.
Exception	1. Credentials entered is invalid. Please enter correct credentials. Go back to alternative flow 1.4. 2. Credentials entered is invalid. Please enter correct credentials. Go back to alternative flow 2.1
Related Requirement	-
Post-conditions	Successful completion ● The alumni staff may proceed with other operations to book the facility.

Table 2.6: Use Case Specification for <Reserve Facility>

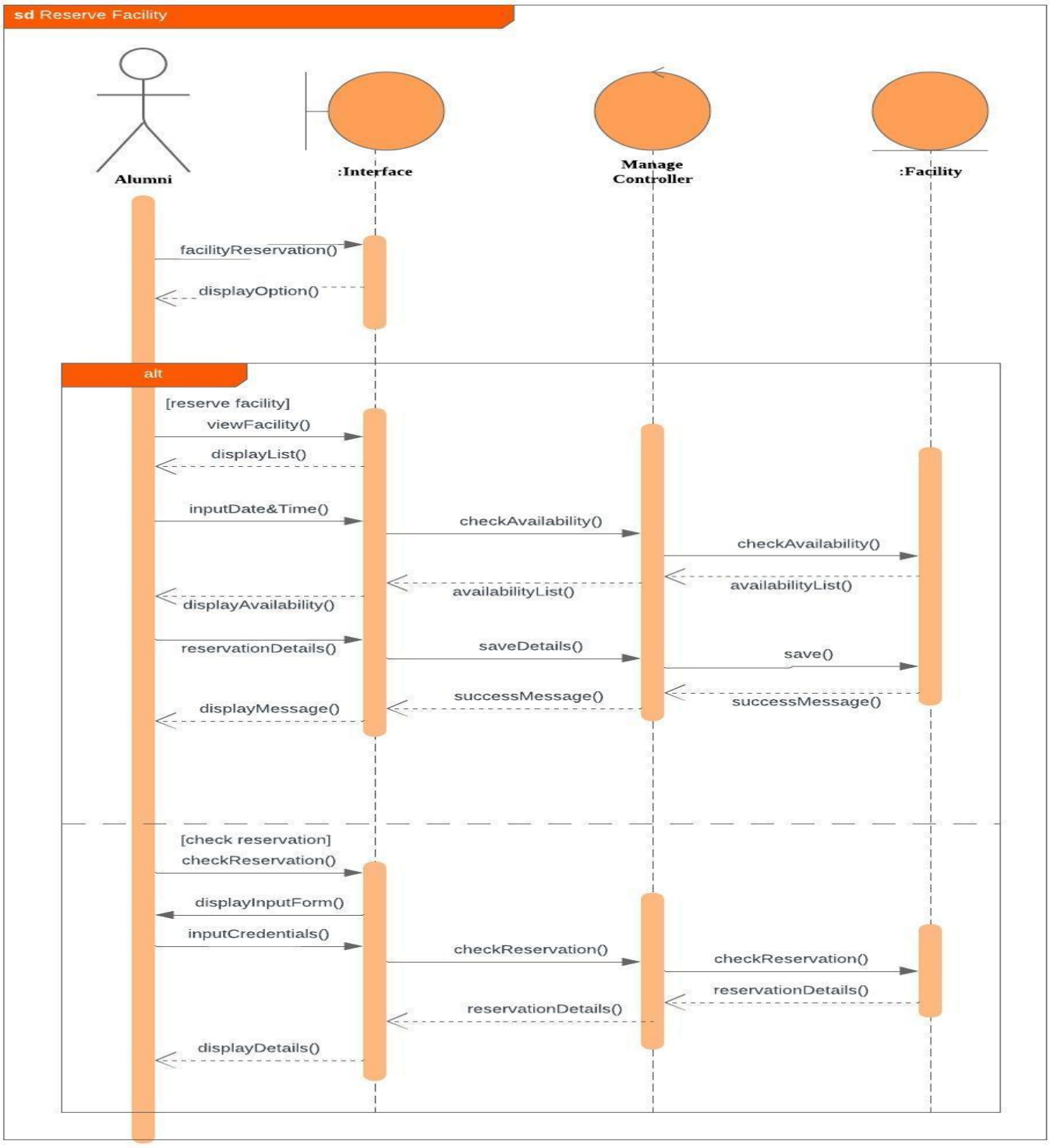

Figure 2.11: Sequence Diagram of Reserve Facility

Figure 2.12: Activity Diagram of Reserve Facility

2.7 UC007: Use Case View event

Use Case	View event
ID	UC007
Brief description	Alumni staff and alumni can view the existing events.
Actors	User(alumni staff or alumni)
Related use case	UC008, UC009
Pre-conditions	• There is an active network connection to the platform. • The user has successfully logged into the system. • There exists at least one event to be shown.
Normal Flow	1. The use case begins when the alumni staff clicks on the tab “Event”. 2. The system displays list of events. 3. If user wish to see the details of a event, Alternative Flow 1 is performed. 4. If alumni staff wish to manage the event, UC009 is performed. 5. The use case ends.
Alternative Flow	1. See the event details 1.1. User click on the particular event. 1.2. System retrieve and display the event details. 1.3. If user click on the “Back” button on the right bottom of the page, back to Normal Flow 2. 1.4. If user click on the “Register” button on the right bottom of the page, proceed to use case UC008.
Exception	-

Related Requirement	-
Post-Conditions	Successful Completion • The event is successfully displayed. The users may proceed with other operations.

Table 2.7: Use Case Specification for <View event>

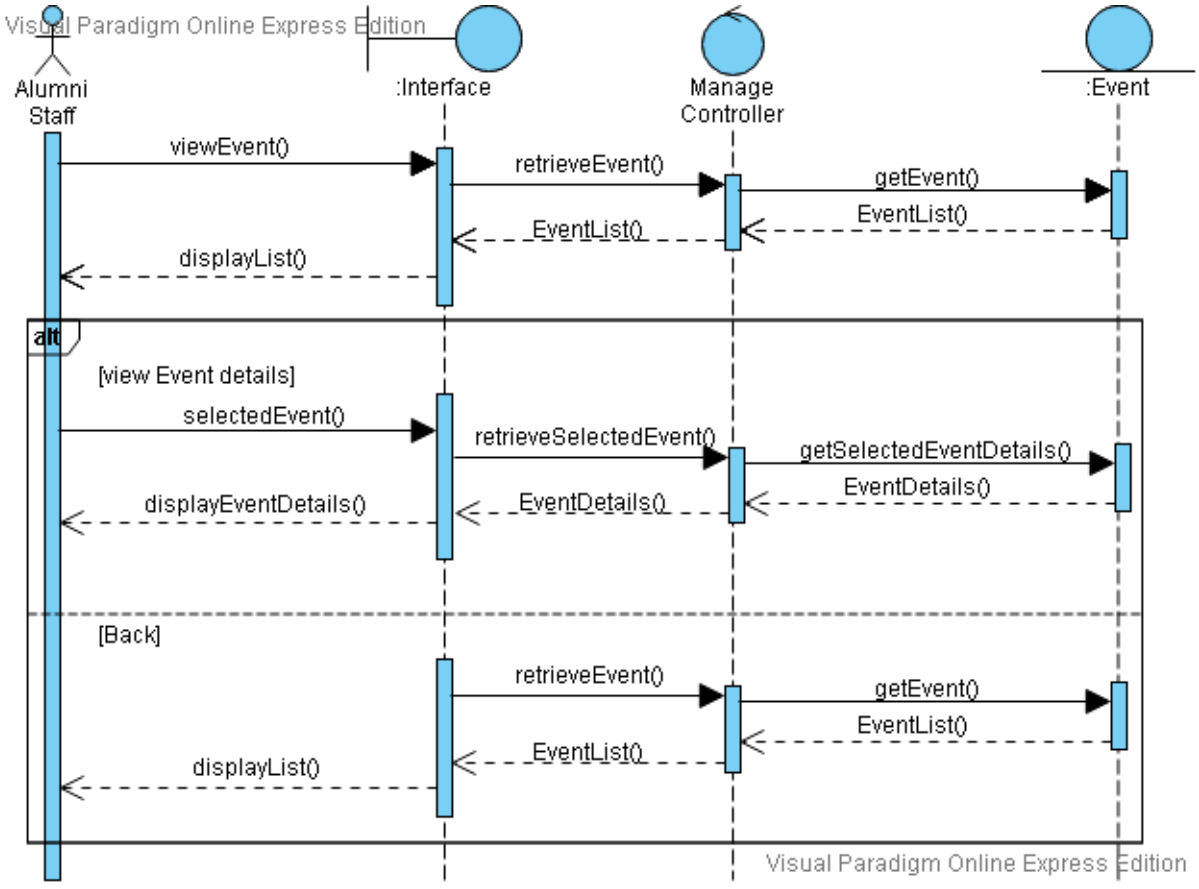

Figure 2.13: Sequence Diagram of <View event>

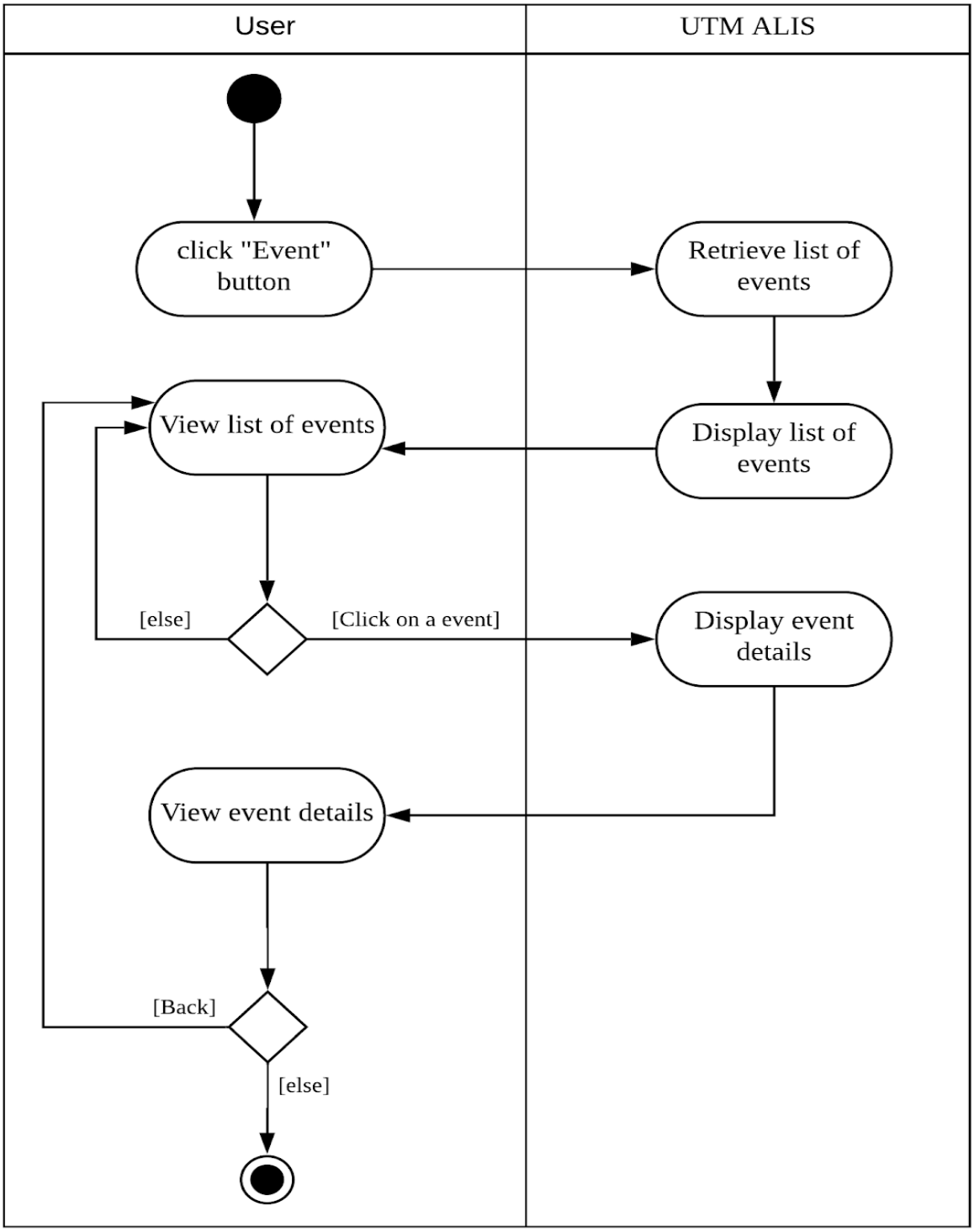

Figure 2.14: Activity Diagram of <View event>

2.8 UC008: Use Case Register event

Use Case	Register Event
ID	UC008
Brief description	Alumni register their attendance for the event they wish to attend.
Actors	1. Alumni
Related Use Case	1. UC007 2. UC012
Pre-conditions	• There is an active network connection to the platform. • The user has successfully logged into the system. • UC007 should have performed.
Normal Flow	1. Use case begins when the alumni selects an event and clicks register. 2. The alumni enter attendance details. 3. If the alumni is required to pay for the event, UC012 is performed. 4. System stores the attendance details in Event Management Database. 5. The use case ends.
Alternative Flow	-
Exception	-
Related Requirement	-
Post-conditions	-

Table 2.8: Use Case Specification for Register Event

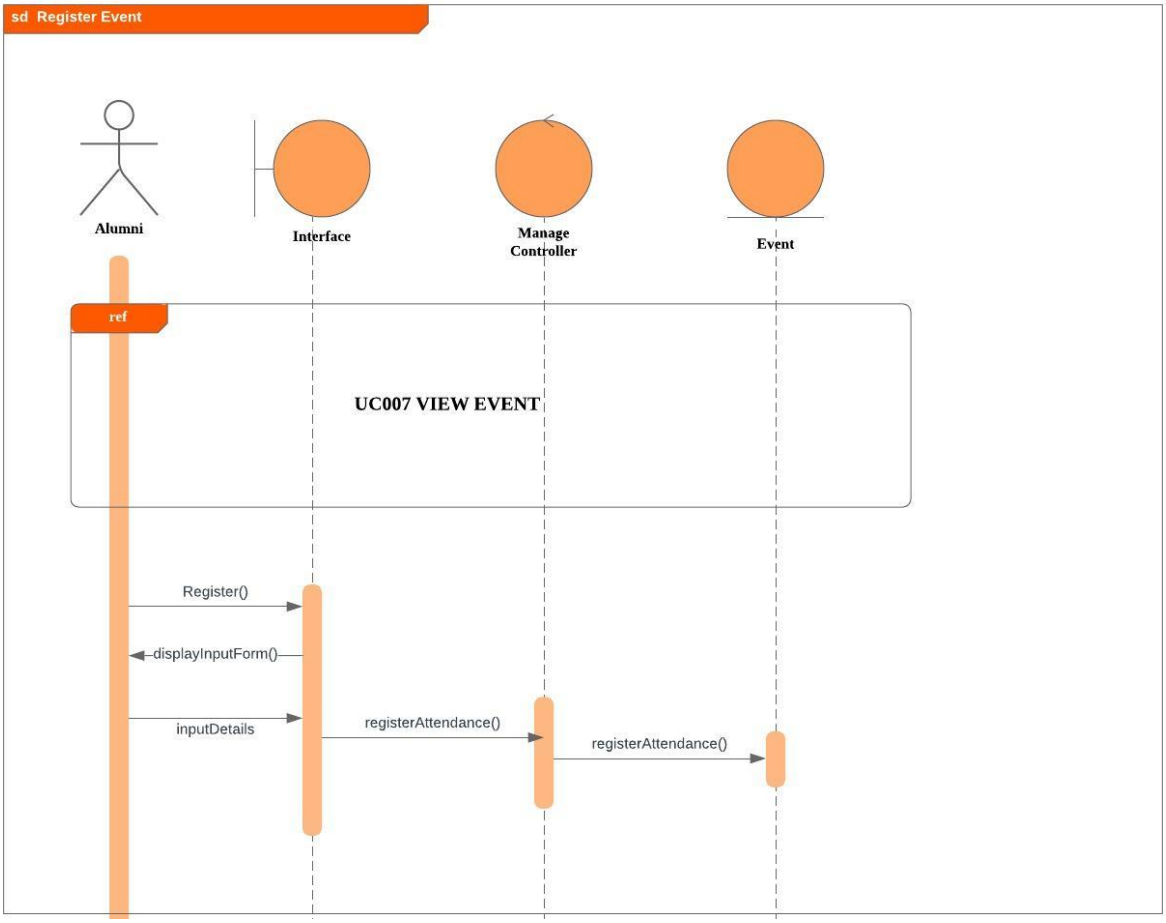

Figure 2.15: Sequence Diagram of Register Event

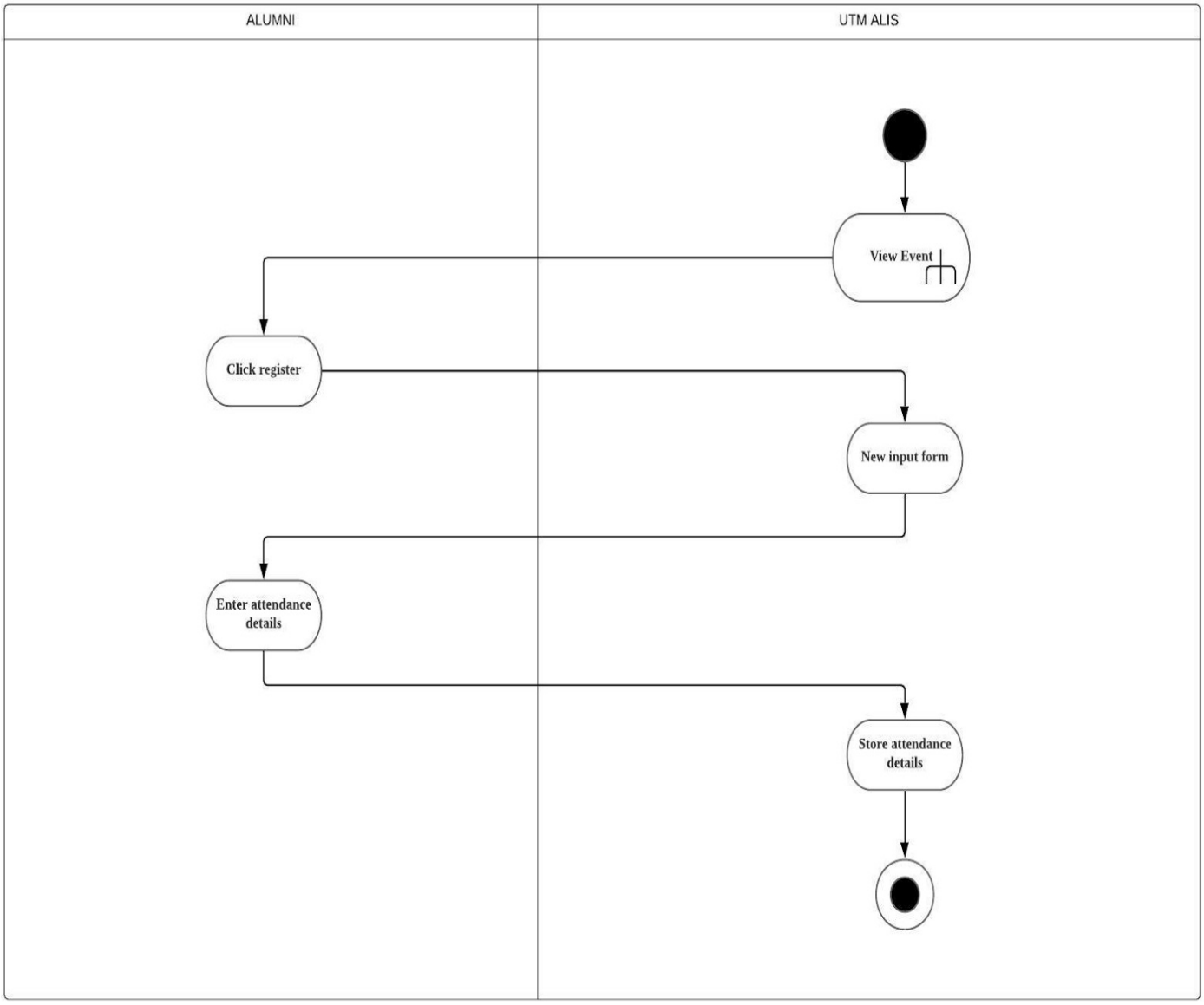

Figure 2.16: Activity Diagram of Register event

2.9 UC009: Use Case Manage event

Use Case	Manage event
ID	UC009
Brief description	Add new event when there is a new event and modify/delete the existing job or project collaboration posts.
Actors	Alumni staff
Related use case	UC007
Pre-conditions	• There is an active network connection to the platform. • The alumni staff has successfully logged into the system. • There exists at least one job or project collaboration posts to be modified/deleted. • There is a new event.
Normal Flow	1. The use case begins when the alumni staff clicks on the tab “Manage event”. 2. The system displays list of events. 3. If alumni staff wish to post a new event, Alternative Flow 1 is performed. 4. If alumni staff wish to modify events, Alternative Flow 2 is performed. 5. If alumni staff wish to delete events, Alternative Flow 3 is performed. 6. The system displays the latest list of events. 7. The use case ends.
Alternative Flow	1. Add new event 1.1. Alumni staff click “Add new” button at the bottom of the page. 1.2. System displays a new input form.

	1.3. Enter the new events details, which may include the date, time, venue, organiser etc.. 1.4. If the alumni staff clicks on “back” icon situated at the right bottom of the page, the system returns to Normal Flow 2. 1.5. If the alumni staff clicks “save” button at the bottom of the page, the flow returned to Normal Flow 6. 2. Modify event 2.1. Alumni staff select which event to be modified by checking the checkbox at the left side of each event. Selection can be more than one. 2.2. Alumni staff click “Modify” button at the bottom of the page. 2.3. System displays editable events’ details. 2.4. Alumni staff edit the descriptions of events. 2.5. If the alumni staff clicks on “back” icon situated at the right bottom of the page, the system returns to Normal Flow 2. 2.6. If the alumni staff clicks “save” button at the bottom of the page, the flow returned to Normal Flow 6. 3. Delete event 3.1. Alumni staff select which event to be deleted by checking the checkbox at the left side of each event. Selection can be more than one. 3.2. Alumni staff click “Delete” button at the bottom of the page.

	3.3. System pops out message “Confirm delete?”. 3.4. If the alumni staff clicks “Yes” button at the bottom of the pop out message, the flow returned to Normal Flow 6. 3.5. If the alumni staff clicks “No” button at the bottom of the page, the flow returned to Alternative Flow 3.1. 3.6. If the alumni staff clicks on “back” icon situated at the right bottom of the page, the system returns to Normal Flow 2.
Exception	-
Related Requirement	-
Post-Conditions	Successful Completion • The events is successfully added/modified/deleted. The alumni staff may proceed with other operations.

Table 2.9: Use Case Specification for <Manage event>

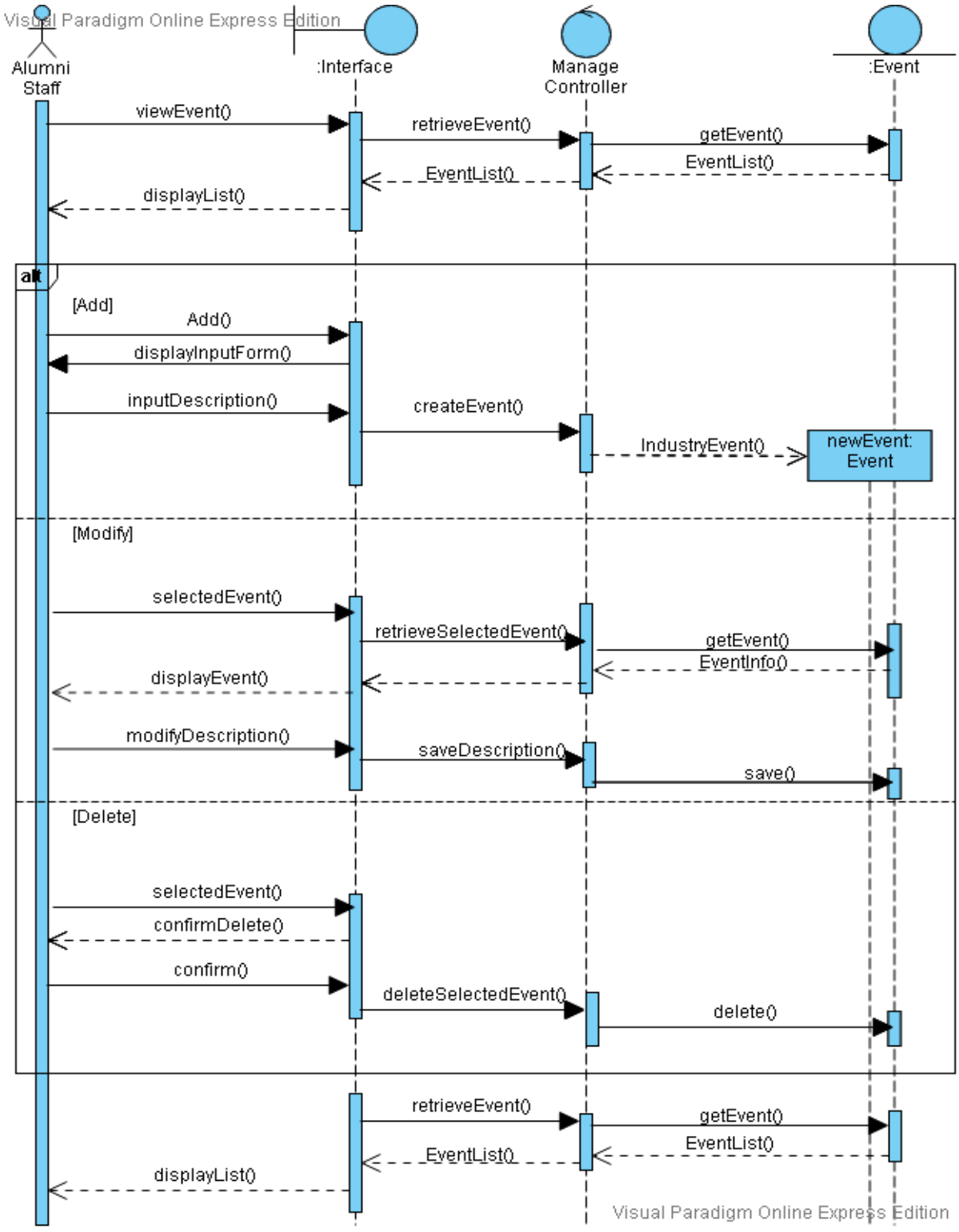

Figure 2.17: Sequence Diagram of <Manage event>

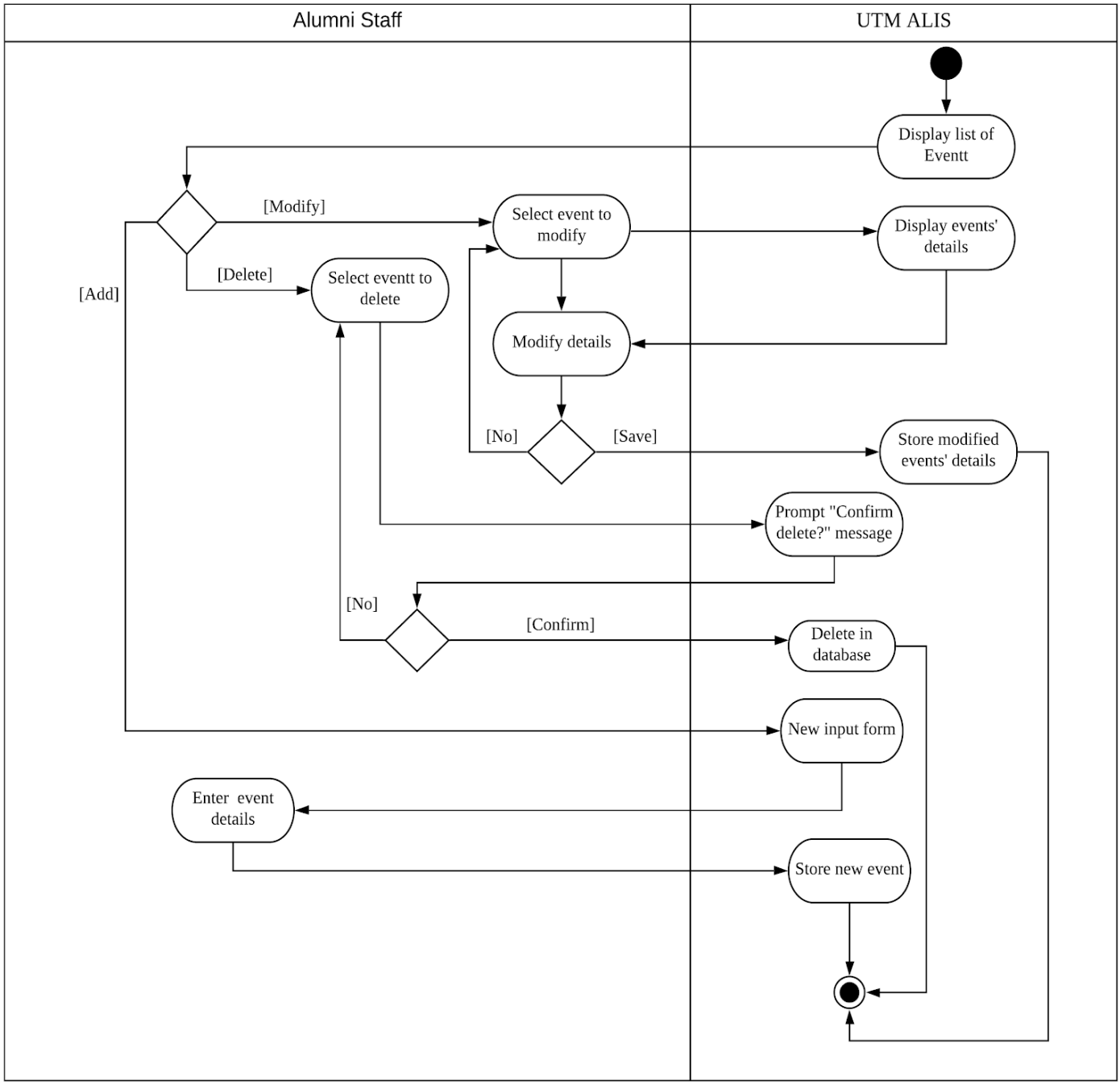

Figure 2.18: Activity Diagram of <Manage event>

2.10 UC010: Use Case View industrial linkages

Use Case	View industrial linkages
ID	UC010
Brief description	Alumni staff and alumni can view the existing job/project specification posts.
Actors	User (alumni staff or alumni)
Related use case	UC011
Pre-conditions	• There is an active network connection to the platform. • The user has successfully logged into the system. • There exists at least one job or project collaboration posts to be shown.
Normal Flow	1. The use case begins when the alumni staff clicks on the tab “Industrial linkages”. 2. The system displays list of job or project collaboration posts. 3. If user wish to see the details of a particular job or project collaboration posts, Alternative Flow 1 is performed. 4. If alumni staff wish to manage the posts, use case UC011 is performed. 5. The use case ends.
Alternative Flow	1. See the job or project collaboration details 1.1. User click on the particular job or project collaboration post. 1.2. System retrieve and display the job or project collaboration details. 1.3. If user click on the “Back” button on the right bottom of the page, back to Normal Flow 2.

Exception	-
Related Requirement	-
Post-Conditions	Successful Completion • The job/ project collaboration posts is successfully displayed. The users may proceed with other operations.

Table 2.10: Use Case Specification for <View industrial linkages>

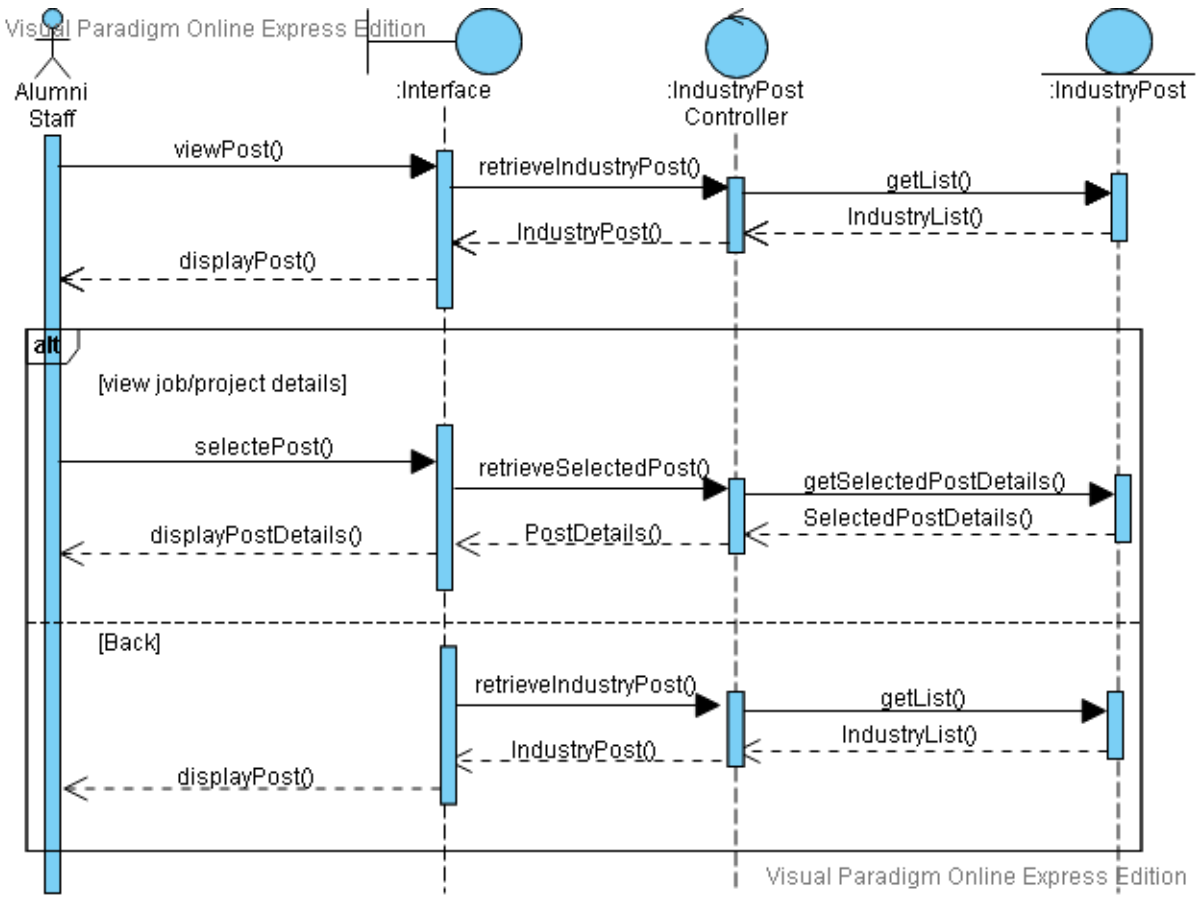

Figure 2.19: Sequence Diagram of <View industrial linkages >

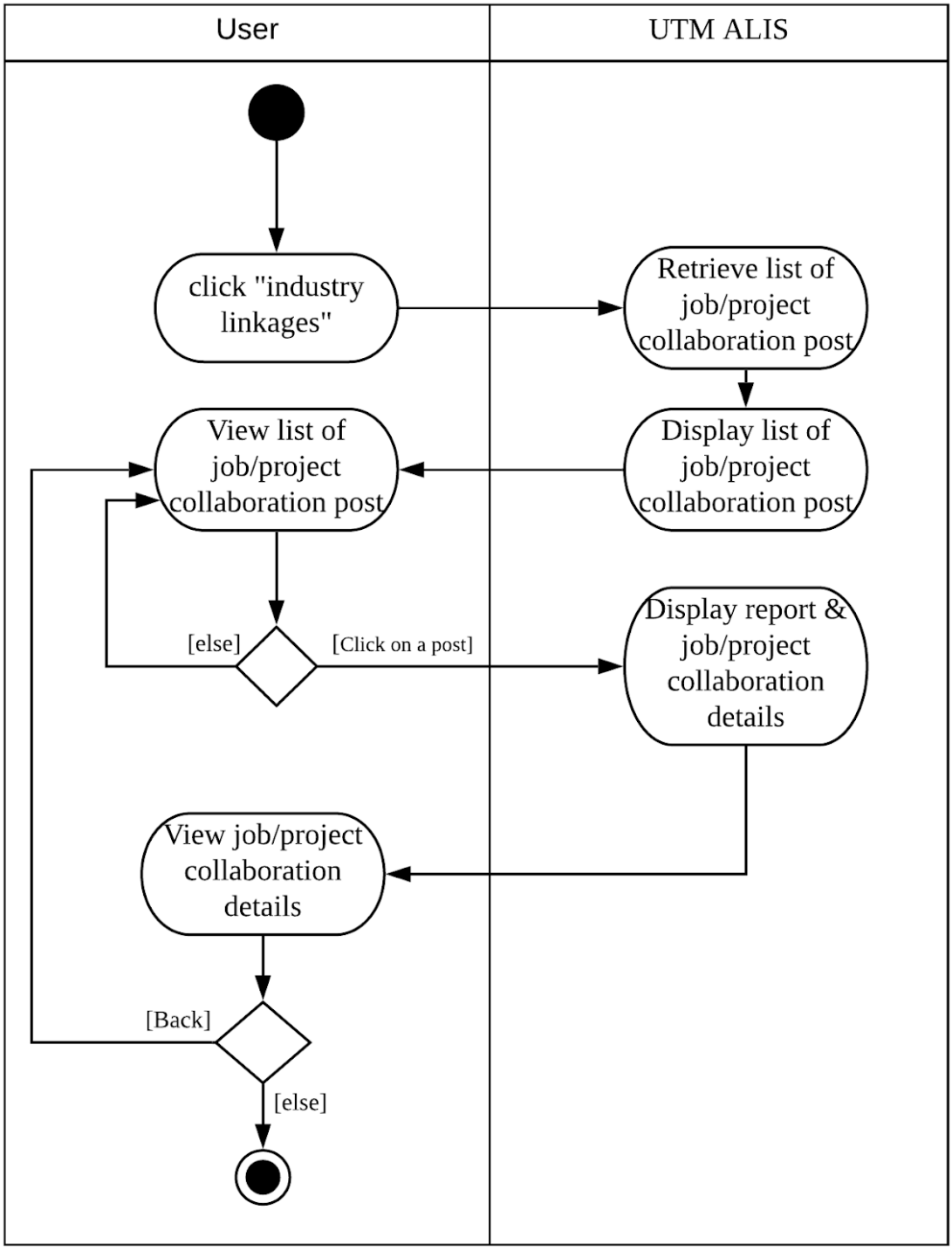

Figure 2.20: Activity Diagram of <View industrial linkages >

2.11 UC011: Use Case Manage industrial linkages

Use Case	Manage industrial linkages
ID	UC011
Brief description	Add new job or project collaboration posts when there is a new email from industries after validation and modify/delete the existing job or project collaboration posts.
Actors	Alumni staff
Related use case	UC010
Pre-conditions	• There is an active network connection to the platform. • The alumni staff has successfully logged into the system. • There exists at least one job or project collaboration posts to be modified/deleted. • There is a new email from industries related to new job or project to be posted.
Normal Flow	1. The use case begins when the alumni staff clicks on the tab “Manage industrial linkages”. 2. The system displays list of job or project collaboration posts. 3. If alumni staff wish to post a new job/project collaboration, Alternative Flow 1 is performed. 4. If alumni staff wish to post a new job/project collaboration, Alternative Flow 2 is performed. 5. If alumni staff wish to post a new job/project collaboration, Alternative Flow 3 is performed. 6. The system displays the latest list of job or project collaboration posts. 7. The use case ends.

Alternative Flow	1. Add new job/ project collaboration post 1.1. Alumni staff click “Add new” button at the bottom of the page. 1.2. System displays a new input form. 1.3. Enter the new job/ project collaboration description, which may include the criteria, contact of the industry etc. 1.4. If the alumni staff clicks on “back” icon situated at the right bottom of the page, the system returns to Normal Flow 2. 1.5. If the alumni staff clicks “save” button at the bottom of the page, the flow returned to Normal Flow 6. 2. Modify job/ project collaboration post 2.1. Alumni staff select which post to be modified by checking the checkbox at the left side of each post. Selection can be more than one. 2.2. Alumni staff click “Modify” button at the bottom of the page. 2.3. System displays editable descriptions of job/ project collaborations. 2.4. Alumni staff edit the descriptions of job/ project collaborations. 2.5. If the alumni staff clicks on “back” icon situated at the right bottom of the page, the system returns to Normal Flow 2. 2.6. If the alumni staff clicks “save” button at the bottom of the page, the flow returned to Normal Flow 6.

	3. Delete job/ project collaboration post 3.1. Alumni staff select which post to be deleted by checking the checkbox at the left side of each post. Selection can be more than one. 3.2. Alumni staff click “Delete” button at the bottom of the page. 3.3. System pops out message “Confirm delete?”. 3.4. If the alumni staff clicks “Yes” button at the bottom of the pop out message, the flow returned to Normal Flow 6. 3.5. If the alumni staff clicks “No” button at the bottom of the page, the flow returned to Alternative Flow 3.1. 3.6. If the alumni staff clicks on “back” icon situated at the right bottom of the page, the system returns to Normal Flow 2.
Exception	-
Related Requirement	-
Post-Conditions	Successful Completion • The job/ project collaboration post is successfully added/modified/deleted. The alumni staff may proceed with other operations.

Table 2.11: Use Case Specification for <Manage industrial linkages>

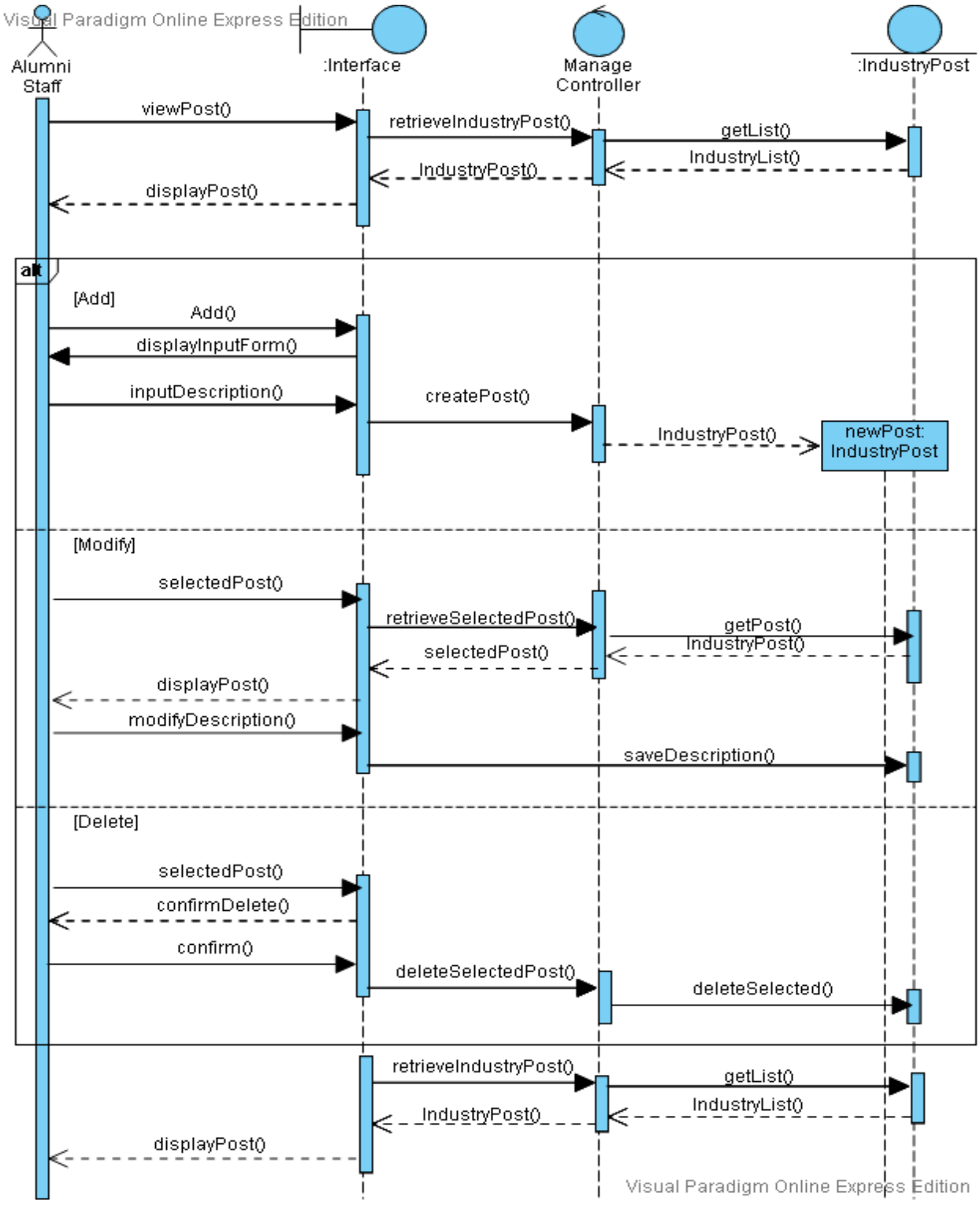

Figure 2.21: Sequence Diagram of <Manage industrial linkages >

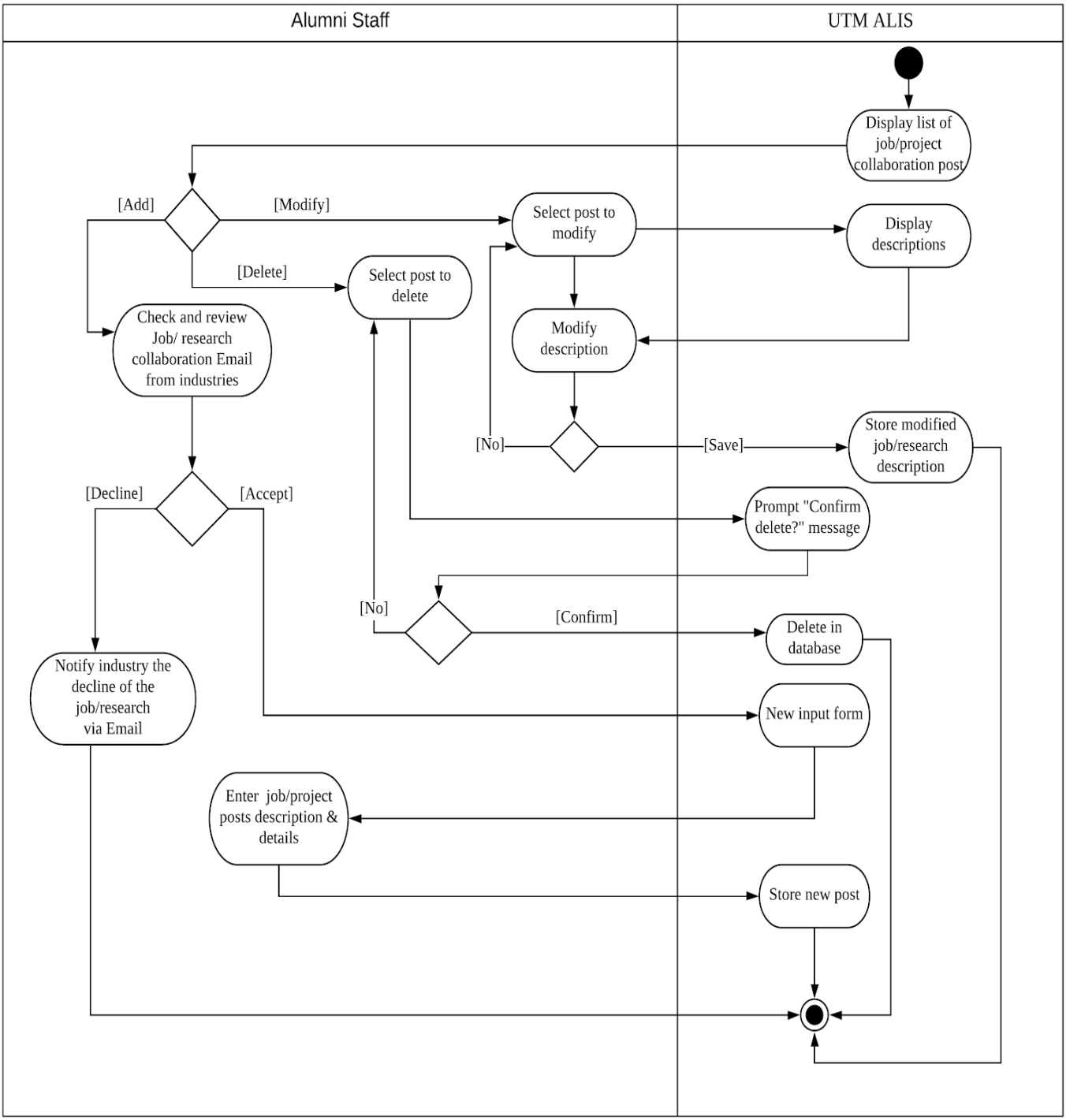

Figure 2.22: Activity Diagram of <Manage industrial linkages >

2.12 UC012: Use Case Select payment method

Use Case	Select payment method
ID	UC012
Brief description	Select payment method to pay event registration fee/ reservation fee/ endowment fund.
Actors	Alumni
Related use case	UC002, UC006, UC008, UC013
Pre-conditions	• There is an active network connection to the platform. • The alumni staff has successfully logged into the system. • Alumni is asked to pay in the system.
Normal Flow	1. The use case begins by redirecting to pay page. 2. The system shows the amount of payment. 3. The system displays list of payment method. 4. Alumni select payment method by clicking on the tab that represent different payment method. 5. If the alumni staff clicks on “back” icon situated at the right bottom of the page, the system returns to normal flow 2. 6. If alumni click “Proceed to pay” button at the right bottom of the page. Use case UC013 is followed. 7. The use case ends.
Alternative Flow	-
Exception	-
Related Requirement	-

Post-Conditions	Successful Completion • The alumni select an appropriate payment method and proceed to use case UC012 to complete the payment.

Table 2.12: Use Case Specification for <Select payment method>

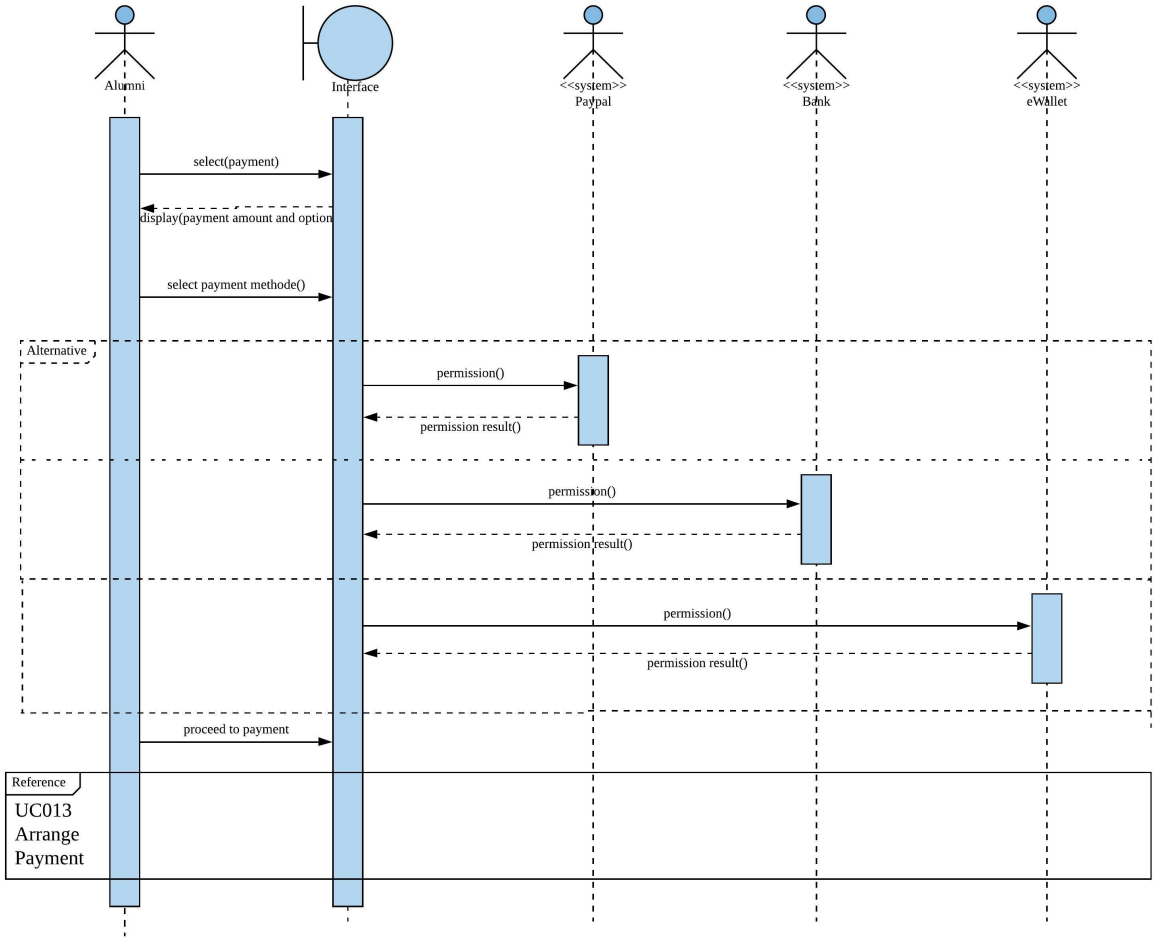

Figure 2.23: Sequence Diagram of <Select payment method>

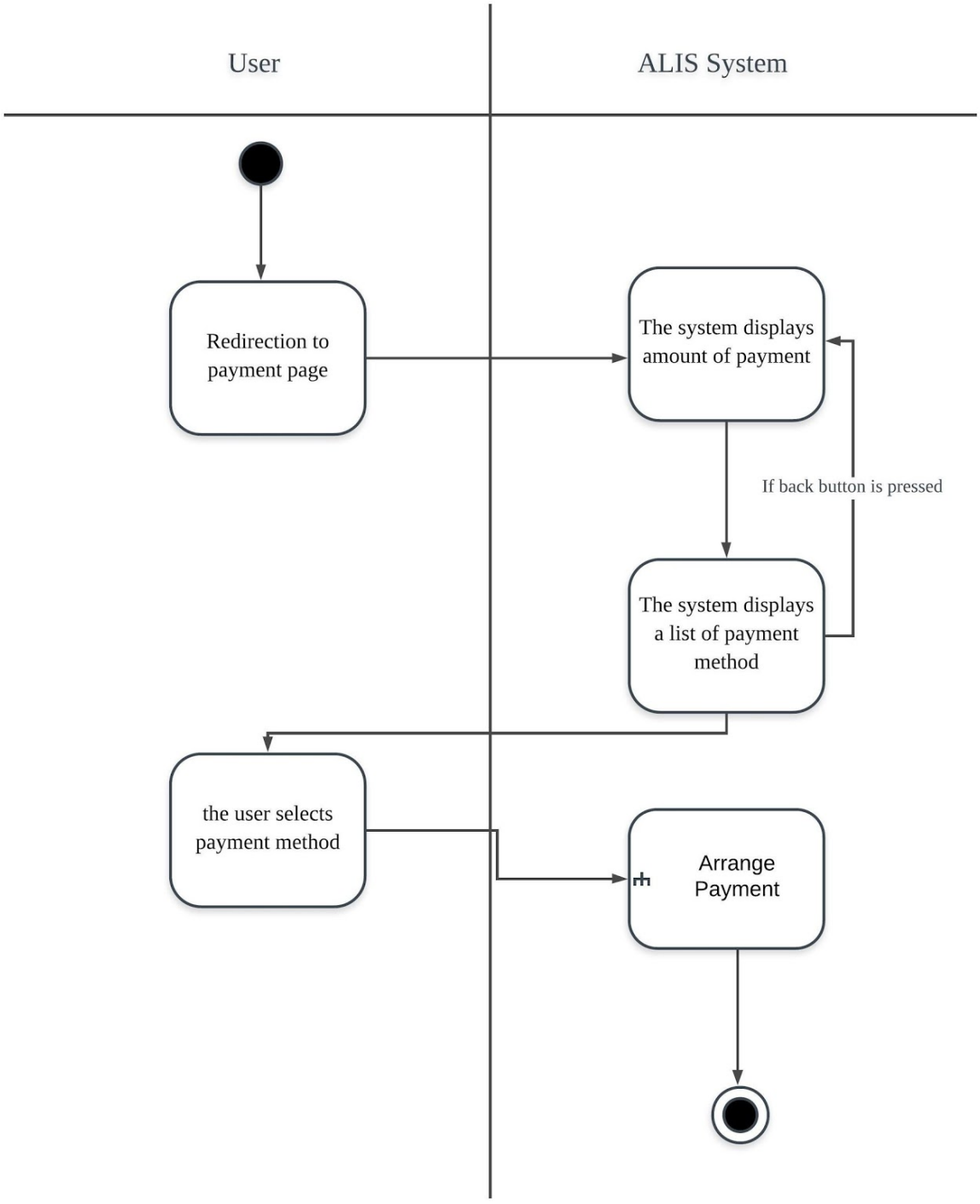

Figure 2.24 Activity Diagram of <Select payment method>

2.13 UC013: Use Case Arrange payment

Use Case	Arrange payment
ID	UC013
Brief description	Select payment method to pay event registration fee/ reservation fee/ endowment fund.
Actors	Payment system
Related use case	UC002, UC006, UC008, UC012
Pre-conditions	• There is an active network connection to the platform. • The alumni staff has successfully logged into the system. • Alumni is asked to pay in the system. • Alumni has chosen payment method in UC012.
Normal Flow	1. If alumni choose to pay in PayPal, Alternative flow 1 is followed. 2. If the member chooses to pay in credit card, Alternative Flow 2 is followed. 3. If the member chooses to pay in eWallet, Alternative Flow 3 is followed. 4. If payment not successful, proceed with Exception 1. 5. If the alumni staff clicks on “back” icon situated at the right bottom of the page, the system returns to use case UC012. 6. If payment is successful, the system stores the payment in the payment history of alumni with payment status “Success”. 7. The use case ends.
Alternative Flow	1. Pay by PayPal 1.1. System redirect to the PayPal site. 1.2. Member log in to their account.

	1.3. If fail to login, go to Exception 2. 1.4. Click “Pay the required amount”. 2. Pay by using credit card 2.1. Enter the credit card information 2.2. System redirect to the bank payment site. 2.3. Member receive a MSOS code/ TAC code. 2.4. Member enter the code received. 2.5. Member receive payment confirmation message on their phone. 3. Pay by using eWallet 3.1. System redirect to the chosen eWallet site. 3.2. eWallet system display the amount needed to pay along with a payment QR code. 3.3. Alumni scan the QR code by using their eWallet apps on their phone. 3.4. Alumni receive payment confirmation message on their phone.
Exception	1. Payment not successful 1.1. The system stores the payment in the payment history of alumni with payment status “unpaid”. 1.2. Alumni can click the “pay” button beside the payment and proceed to Normal Flow 1 again. 2. User inputs wrong banking account, credit card and e-Wallet information then the system shows “wrong information” massage then back to Alternative Flow 1.1, 2.1& 3.1 respectively.
Related Requirement	-

Post-Conditions	Successful Completion • The alumni select an appropriate payment method and proceed to use case UC012 to complete the payment. • System store the payment into alumni's payment history.

Table 2.13: Use Case Specification for <Arrange payment>

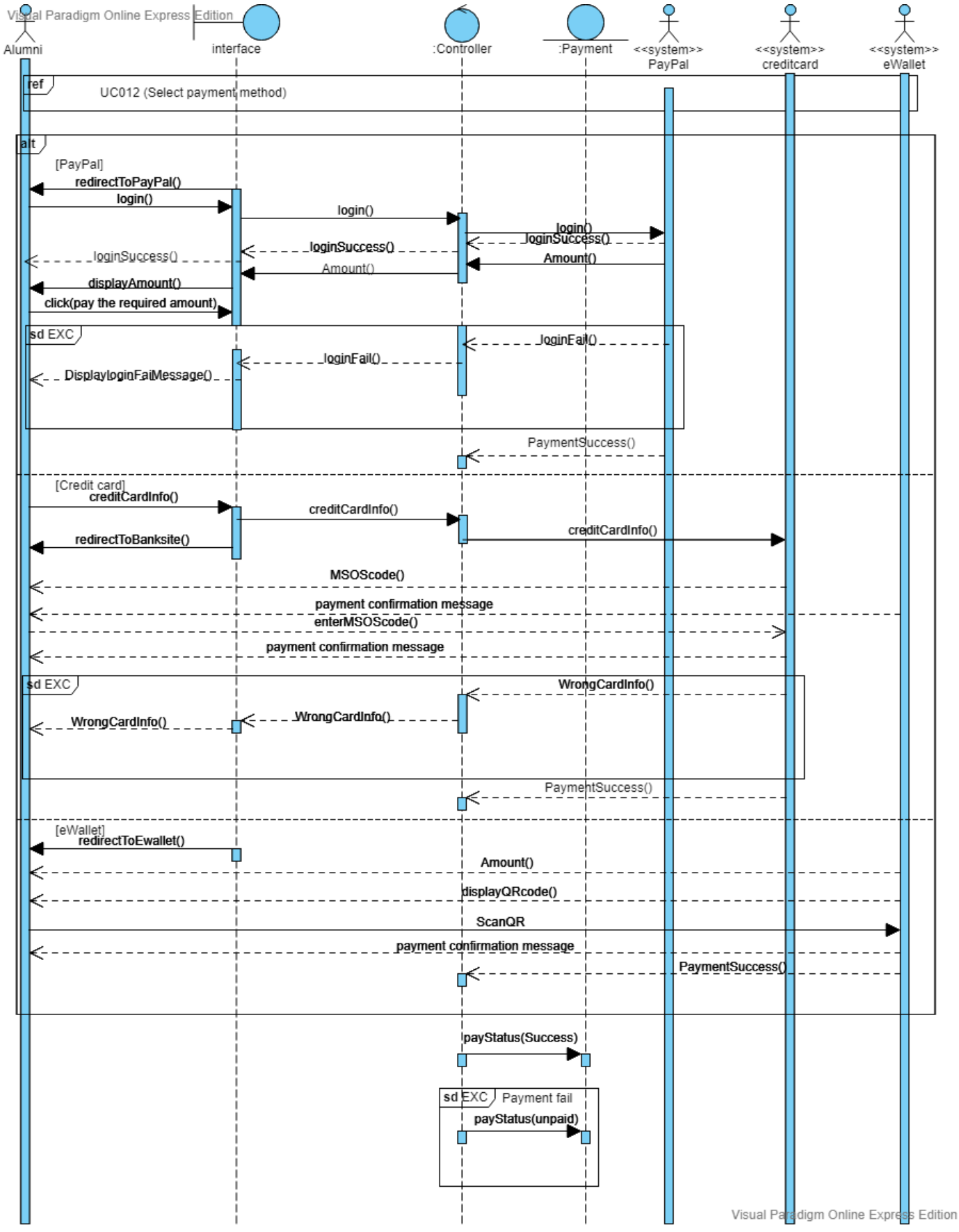
Visual Paradigm Online Express Edition
Alumni
interface
:Controller
:Payment
<<system>>
PayPal
<<system>>
creditcard
<<system>>
eWallet
ref
UC012 (Select payment method)
alt
[PayPal]
redirectToPayPal()
login()
login()
login()
loginSuccess()
loginSuccess()
loginSuccess()
Amount()
Amount()
displayAmount()
click(pay the required amount)
sd EXC
loginFail()
loginFail()
DisplayloginFailMessage()
PaymentSuccess()
[Credit card]
creditCardInfo()
creditCardInfo()
creditCardInfo()
redirectToBanksite()
MSOScode()
payment confirmation message
enterMSOScode()
payment confirmation message
sd EXC
WrongCardInfo()
WrongCardInfo()
WrongCardInfo()
PaymentSuccess()
[eWallet]
redirectToEwallet()
Amount()
displayQRcode()
ScanQR
payment confirmation message
PaymentSuccess()
payStatus(Success)
sd EXC
Payment fail
payStatus(unpaid)
Visual Paradigm Online Express Edition

Figure 2.25: Sequence Diagram of <Arrange Payment>

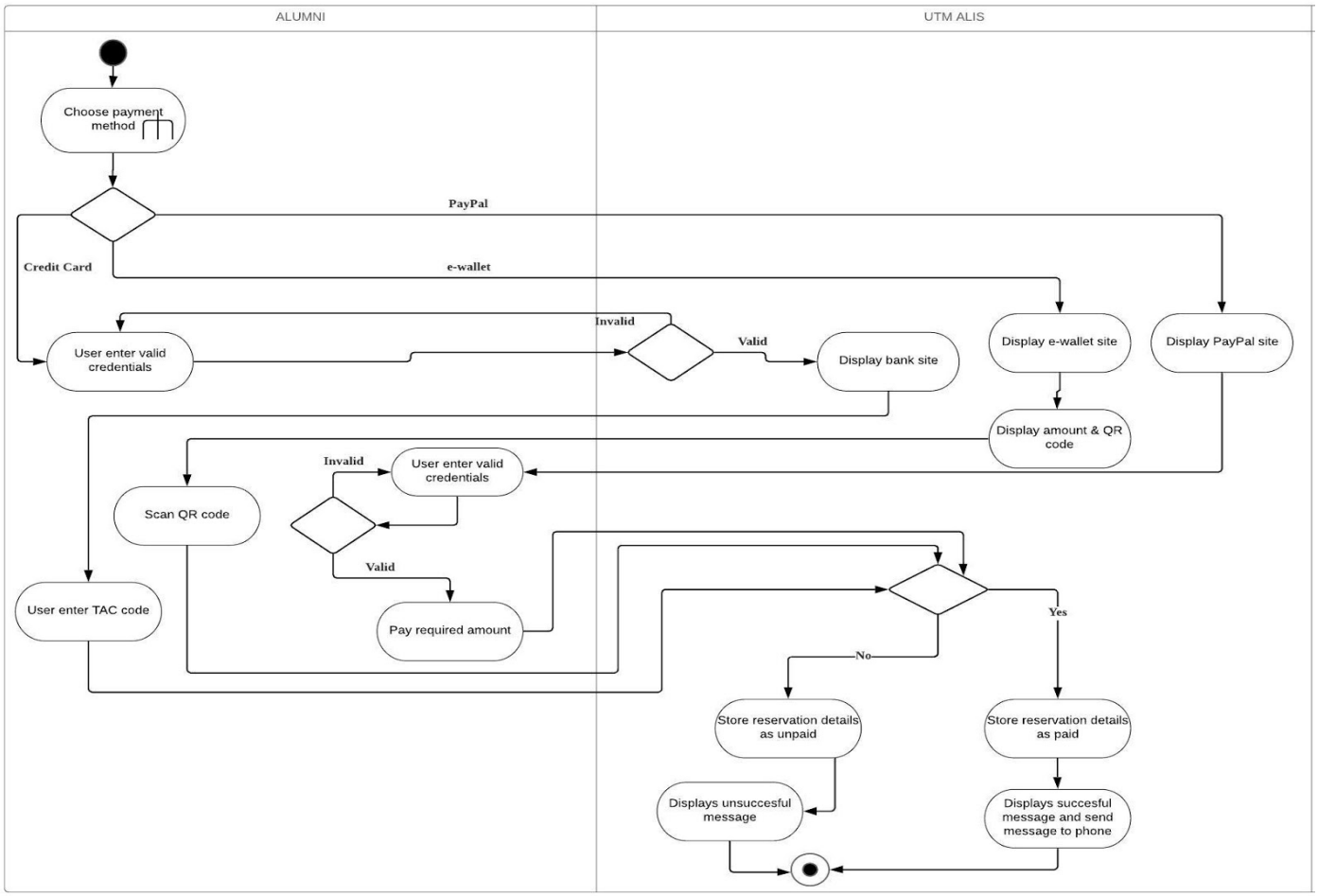

Figure 2.26: Activity Diagram of <Arrange Payment>

3. Non-Functional Requirements

3.1 Security

The system shall be able to provide authorization only for specific person such as alumni and alumni staff.

3.2 Efficiency

Data cleaning should be performed immediately after getting the data from various databases (UTM SRAD, UTMSPACE, UTM FOUNDATION). Time taken should less than 10 seconds.

When database arrive from various sources to alumni system it should clarify all the fields and put descriptions such as (Matric no., name etc.).

- **goals are easy to accomplish quickly and with few or no user errors**

3.3 Compatibility

Alumni services and newsfeed shall be able to access from many platforms such as PC, smartphone, tablets etc.

3.4 Integration

Alumni system shall synchronize and store data that is collected from many sources immediately in databases. Synchronization should be performed every 12 hours, time taken for the synchronization should be less than 5 minutes.

3.5 Culture

The user interface shall not contain any sensitive issues that is abusive to any culture nor encourage racism.

3.6 Privacy

The system stored personal data of user shall be protected in terms of security and data of users won't be exposed to third party.

3.7 Effectiveness

User should be able to perform the tasks desired accurately. The number of errors to perform a task should be less than 3.

3.8 Usability

An interface should be easy to learn how to use and easy to remember how to use.

- **Efficiency of use: goals are easy to accomplish quickly and with few or no user errors**
- **Intuitiveness: the interface is easy to learn and navigate; buttons, headings, and help/error messages are simple to understand**
- **Low perceived workload: the interface appears easy to use, rather than intimidating, demanding and frustrating**

4. State diagram

4.1 Payment

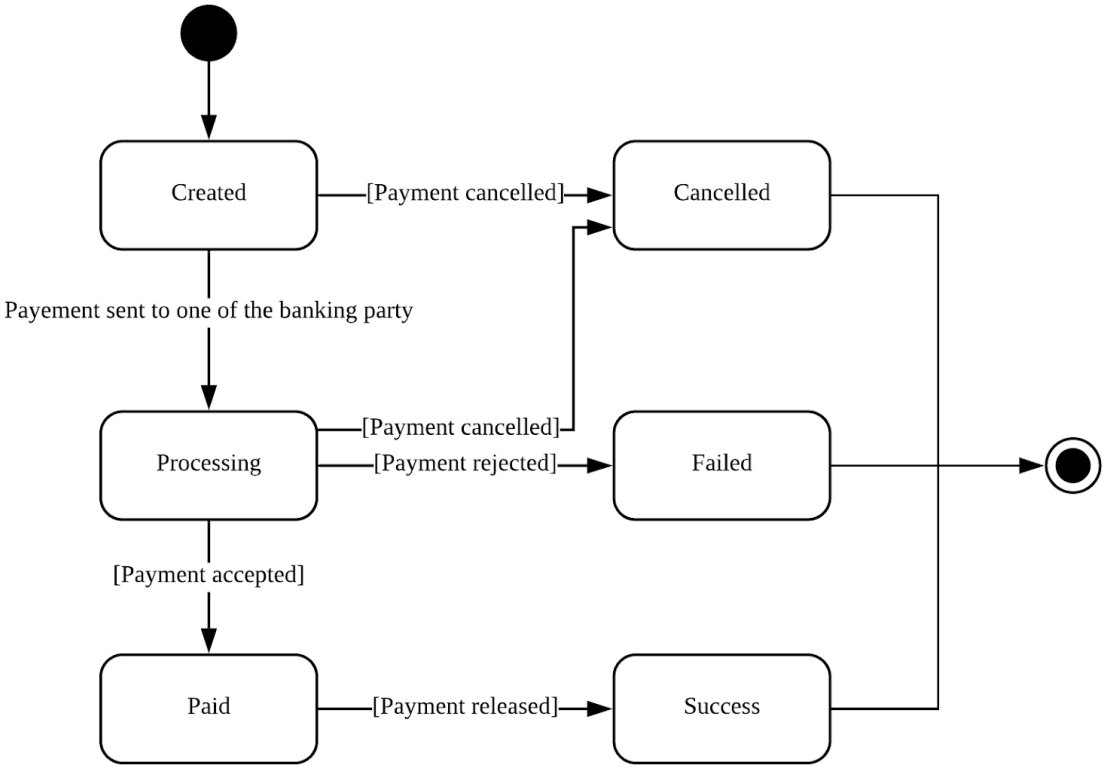

Figure 4.1 State diagram of Payment

4.2 Reservation

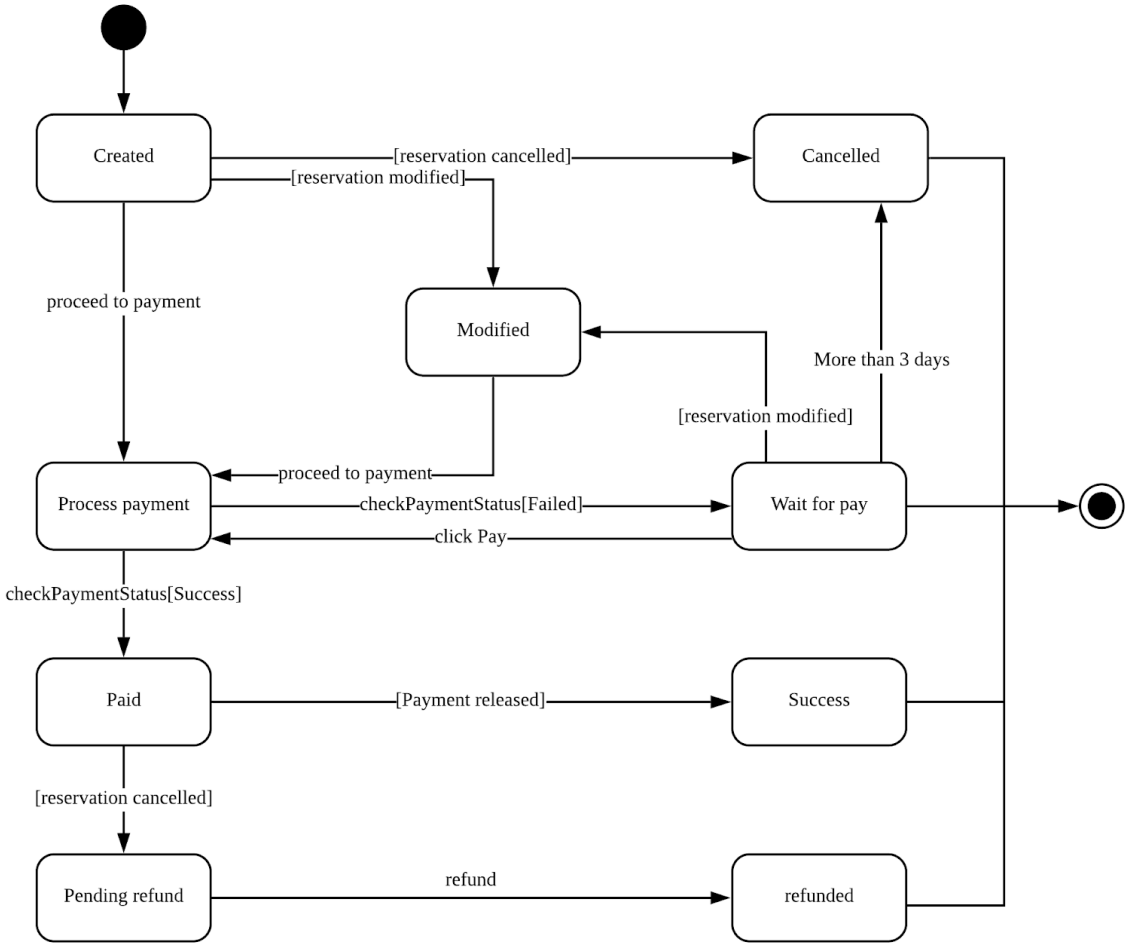

Figure 4.2: State diagram of Reservation