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SECJ2154 OBJECT ORIENTED PROGRAMMING

SECTION 08

Group Project

Title: Cross-District and Cross-State Application System

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1.0 Description of the Project

1.1 Introduction

Malaysia is currently undergoing FMCO (Final Movement Control Order) which does not allow the citizens to cross district or state without the cross-district or cross-state letter. Therefore, a cross-district and cross-state application system is created to digitalize the application process for both staff and applicants. From the staff's point of view, staff can view all the pending application details that have been applied by the applicants and make the decision whether the applications should be approved or rejected. Besides, the staff also can track back all the applications that have been handled by him. Next, from the view of the applicant, the applicant can make a cross-district or cross-state application via the system by entering the details required such as basic information (name, address, IC number, email, phone number etc.) and the journey information including arrival time, arrival destination, purpose and transportation used for the journey. After the applicant successfully submit the application, the applicant must wait for the staff to update the status of the application. Applicants can view their application status after the staff processes the application.

This system will help the staff and applicants to complete the whole application process via online. Therefore, applicants would not have to step out from the home to process the application which will increase the risk of being infected by Covid-19 virus.

In this project, we are implementing object-oriented programming concepts such as association, aggregation, inheritance, polymorphism and exception handling to build the fundamentals of the application system. Staff will have an association relationship with the application. Aggregation relationship is used between applicant and application and applicant and address. Inheritance and polymorphism is used in application as the superclass and cross-district and cross-state are the subclass of application. Exception handling is used to detect the invalid option input from the user. Other concepts such as encapsulation and data hiding, ArrayList and abstract functions are also implemented into the system.

1.2 Objectives and scopes of the system

The main objectives and scopes of the system are:

1. Implements encapsulation and data hiding concepts into the system.
2. Implements association, aggregation and inheritance relationships into the system.
3. Implements polymorphism concept into the system.
4. Implements exception handling into the system.

1.3 Purposes or significance of the system

The main purposes or significance of the system are:

1. Applicants can create the cross-state or cross-district applications.
2. Applicants can view their applications status.
3. Staff can view all pending applications.
4. Staff can process all the pending applications either approve or reject the applications.
5. Staff can keep track of all the applications that have been handled by him.

2.0 The flowchart/ workflow of the cross-district and cross-state application system

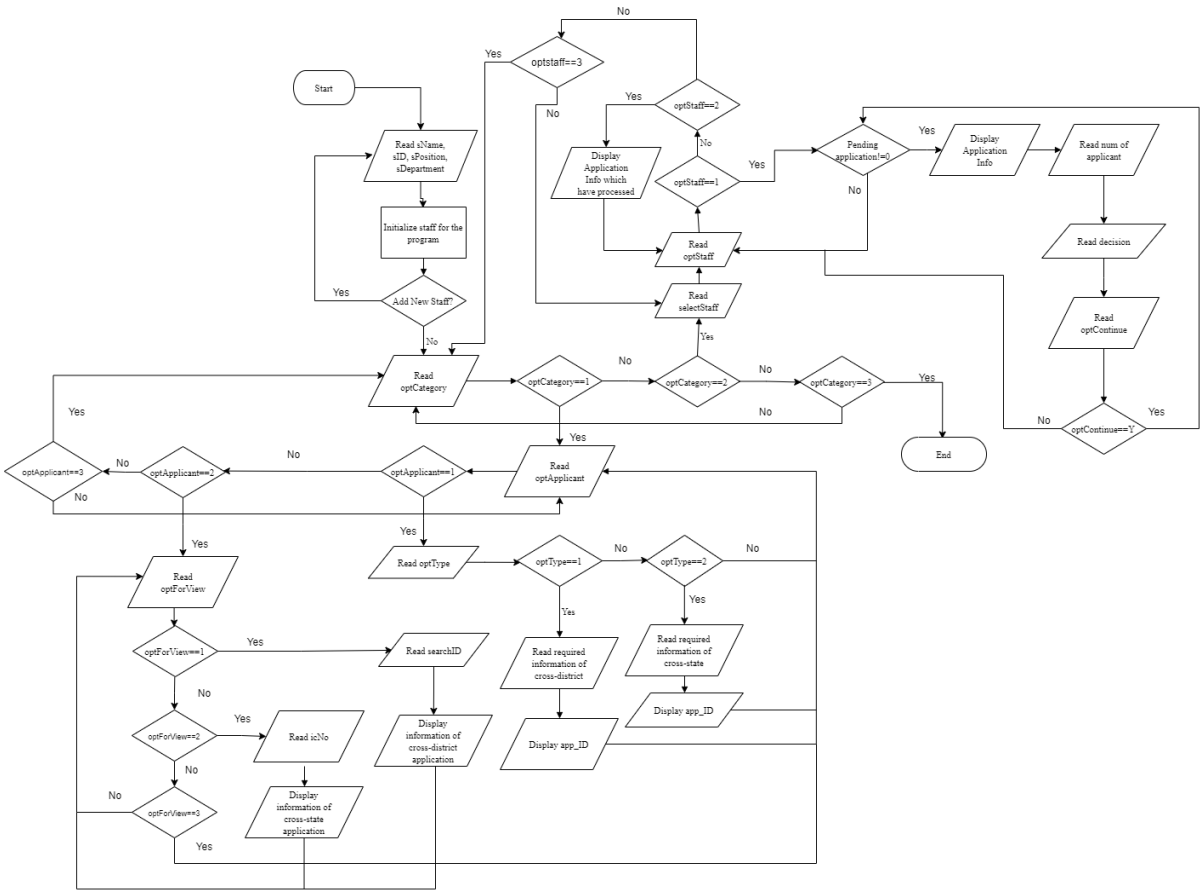

Figure 2.1 The flowchart of the cross-district and cross-state application system

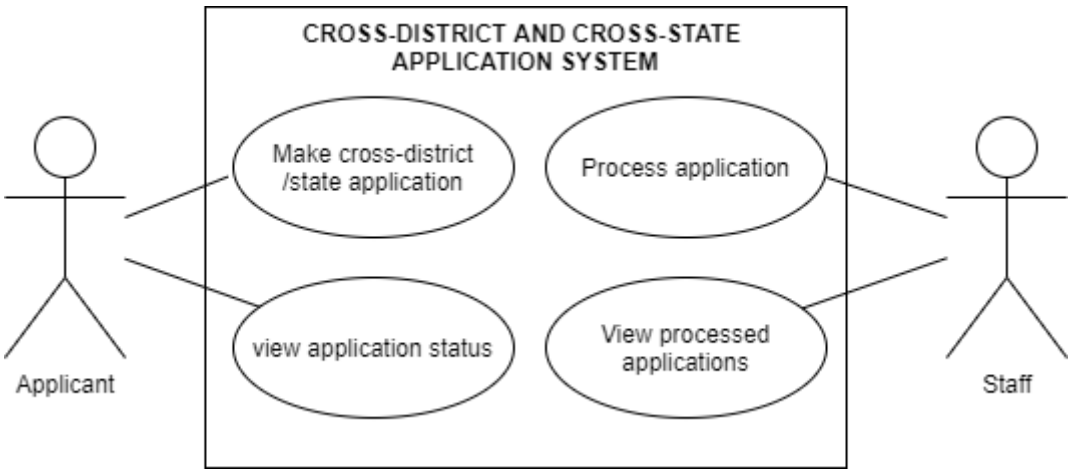

Figure 2.2 The Use Case Diagram of the cross-district and cross-state application system

3.0 The UML class diagram of the cross-district and cross-state application system

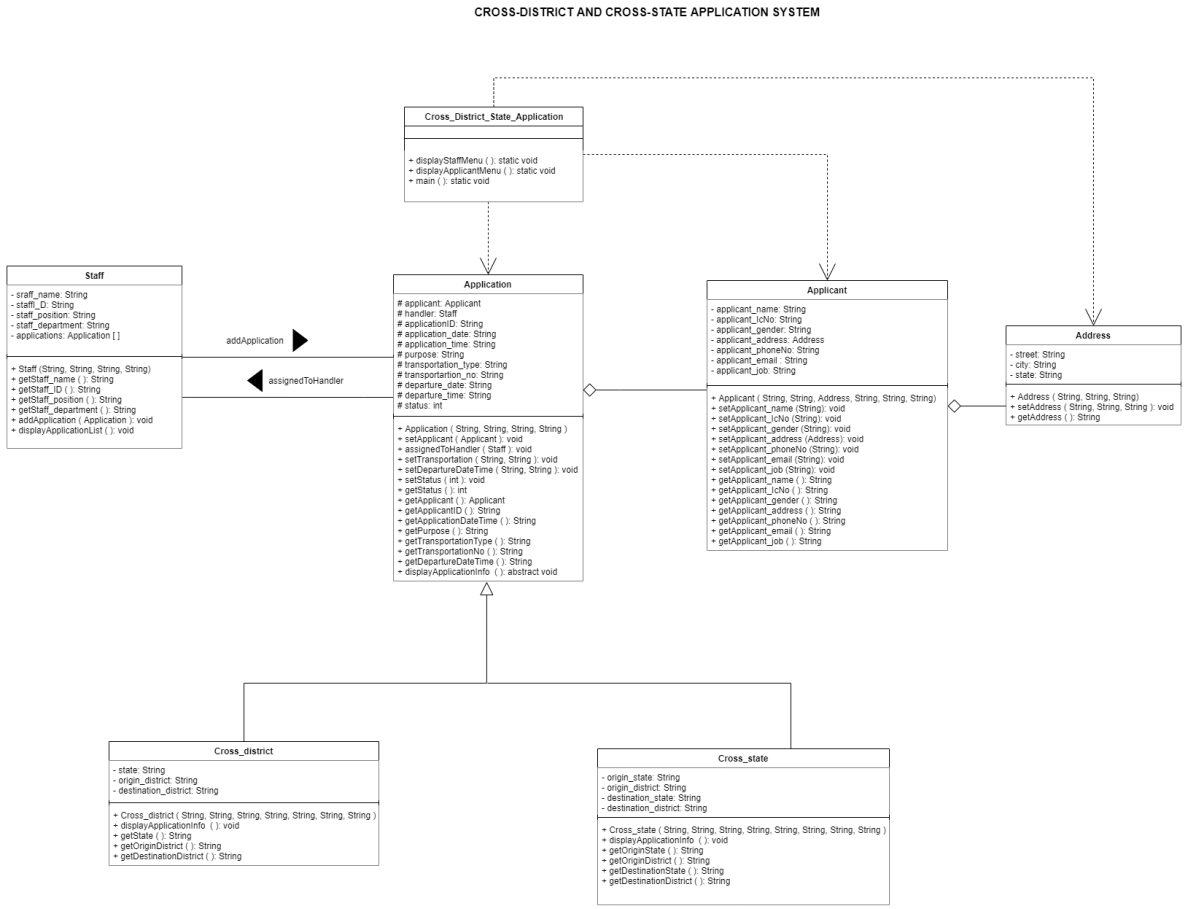

Figure 3.1 UML class diagram of cross-district and cross-state application system

4.0 The implementation of OO concepts in the cross-district and cross-state application system

4.1 Association

The association relationship exists in staff and application class which is staff adds application. Besides, the application class also has the association relationships with staff called as assignedToHandler.

```
public class Staff {
    private String staff_name, staff_ID, staff_position, staff_department;
    Vector <Application> applications;

    public Staff (String staff_name, String staff_ID, String staff_position, String staff_department){

    public String getStaff_name() {···
    public String getStaff_ID() {···

    public String getStaff_position() {···

    public String getStaff_department() {···

    public void addApplication(Application application){
        applications.addElement(application);
    }
```

Figure 4.1.1 Staff addApplication

```
public abstract class Application{
    protected Applicant applicant;
    protected Staff handler;
    protected String applicationID;
    protected String application_date;
    protected String application_time;
    protected String purpose;
    protected String transportation_type;
    protected String transportartion_no;
    protected String departure_date;
    protected String departure_time;
    protected int status;
    Application(String applicationID, String application_date, String application_time, String purpose){···
    public void setApplicant(Applicant a){···
    public void assignedToHandler(Staff handler){
        this.handler = handler;
    }
```

Figure 4.1.2 Application assignedToHandler

4.2 Aggregation

Aggregation relationship shows in the Applicant class and Application class. Each applicant has an address while each application has an applicant.

```
public class Applicant {
    private String applicant_name, applicant_IcNo, applicant_gender,applicant_phoneNo,applicant_email,applicant_job;
    private Address applicant_address;

    public Applicant ()
    public Applicant (String applicant_name, String applicant_IcNo, Address applicant_address, String applicant_phoneNo,
    public void setApplicant_name(String applicant_name) {
    public void setApplicant_IcNo(String applicant_IcNo) {
    public void setApplicant_address(Address applicant_address) {
    public void setApplicant_phoneNo(String applicant_phoneNo) {
    public void setApplicant_email(String applicant_email) {
    public void setApplicant_job(String applicant_job) {
    public void setApplicant_gender(String applicant_gender){
    public String getApplicant_name() {
    public String getApplicant_IcNo() {
    public String getApplicant_address() {
    public String getApplicant_gender() {
    public String getApplicant_phoneNo() {
    public String getApplicant_email() {
    public String getApplicant_job() {
}
```

Figure 4.2.1 Applicant has an address

```
public abstract class Application{
    protected Applicant applicant;
    protected Staff handler;
    protected String applicationID;
    protected String application_date;
    protected String application_time;
    protected String purpose;
    protected String transportation_type;
    protected String transportartion_no;
    protected String departure_date;
    protected String departure_time;
    protected int status;
```

Figure 4.2.2 Application has an applicant

4.3 Inheritance

Inheritance concept is used when the subclass uses the term extend to inherit the attributes and methods from the superclass. In this system, Cross_district and Cross_state are the subclasses of Application.

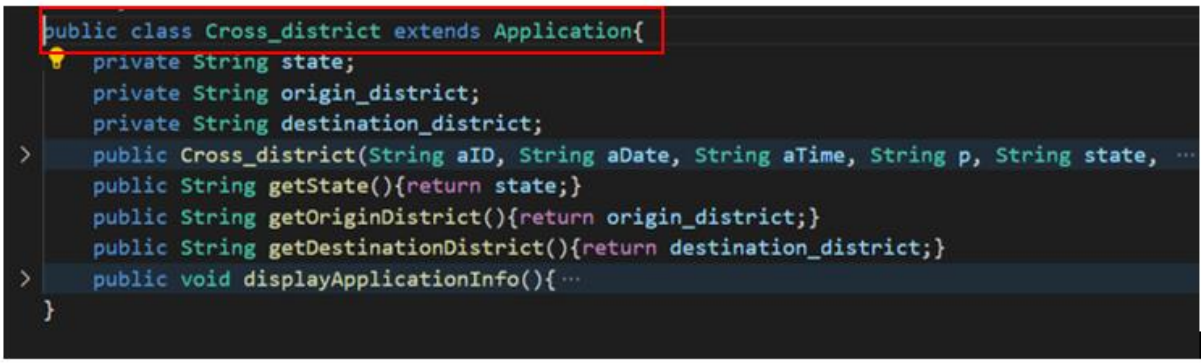

Figure 4.3.1 A Cross_district is an Application

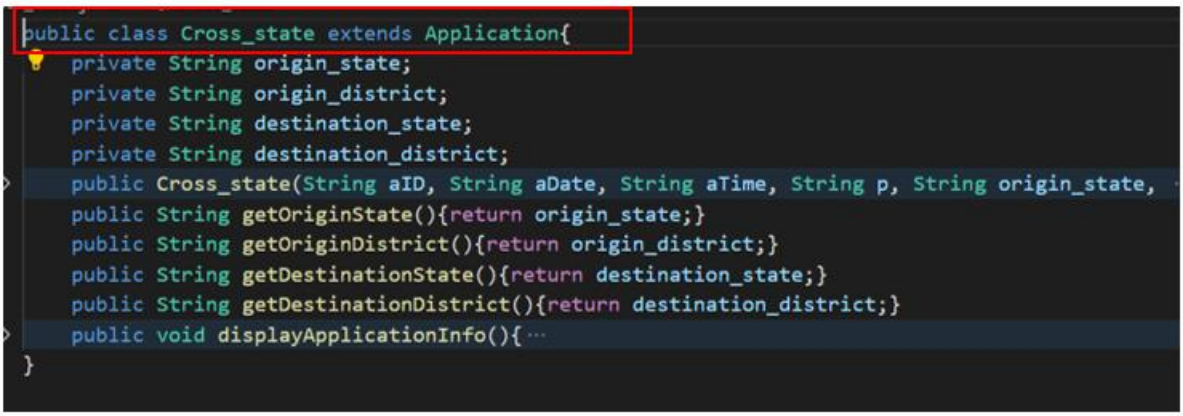

Figure 4.3.2 A Cross_state is an Application

4.4 Polymorphism

Polymorphism is shown when the same method call can lead to different behaviour. In our system, Application has displayApplicationInfo( ) which will override Cross_state or Cross_district based on the object.

```
    public String getTransportationType(){return transportation_type;}
    public String getTransportationNo( ){return transportartion_no;}
    public String getDepartureDateTime(){return departure_date+", "+departure_time;}
    public abstract void displayApplicationInfo();
}
```

Figure 4.4.1 displayApplicationInfo( ) in class Application

```
public void displayApplicationInfo(){
    System.out.println("\n<<<<<<Cross District Application>>>>>>");
    System.out.println("Name: "+applicant.getApplicant_name());
    System.out.println("ICNo: "+applicant.getApplicant_IcNo());
    System.out.println("Address: "+applicant.getApplicant_address());
    System.out.println("Gender: "+applicant.getApplicant_gender()+"\t\t\tPhone No: "+applicant.getApplicant_phoneNo());
    System.out.println("Email: "+applicant.getApplicant_email()+"\t\t\tJob: "+applicant.getApplicant_job());
    System.out.println("Application ID: "+applicationID);
    System.out.println("Application Date & Time: "+getApplicationDateTime());
    System.out.println("Transportation Type: "+getTransportationType()+"\t\t\tVehicle No: "+getTransportationNo( ));
    System.out.println("Origin State: "+getState()+"\t\t\tOrigin District: "+getOriginDistrict());
    System.out.println("Destination District: "+getDestinationDistrict());
    System.out.println("Departure Date & Time: "+getDepartureDateTime());
    System.out.println("Purpose: "+getPurpose());
    String app_status="";
    switch (getStatus()){
                case -1: app_status="Rejected";
                         break;
                case 0: app_status="Pending";
                         break;
                case 1: app_status="Approved";
                         break;
    }
    System.out.println("\nStatus: "+app_status);
    if (!app_status.equals("Pending")){
        System.out.println("\nProcessed by: "+handler.getStaff_name());
        System.out.println("\nPosition:  "+handler.getStaff_position());
        System.out.println("\nDepartment: "+handler.getStaff_department());
    }
```

Figure 4.1.2 displayApplicationInfo( ) in class Cross_district

```
public void displayApplicationInfo(){
    System.out.println("\n<<<<<<Cross State Application>>>>>>");
    System.out.println("Name: "+applicant.getApplicant_name());
    System.out.println("ICNo: "+applicant.getApplicant_IcNo());
    System.out.println("Address: "+applicant.getApplicant_address());
    System.out.println("Gender: "+applicant.getApplicant_gender()+"\t\t\tPhone No: "+applicant.getApplicant_phoneNo());
    System.out.println("Email: "+applicant.getApplicant_email()+"\t\t\tJob: "+applicant.getApplicant_job());
    System.out.println("Application ID: "+applicationID);
    System.out.println("Application Date & Time: "+getApplicationDateTime());
    System.out.println("Transportation Type: "+getTransportationType()+"\t\t\tVehicle No: "+getTransportationNo( ));
    System.out.println("Origin State: "+getOriginState()+"\t\t\tOrigin District: "+getOriginDistrict());
    System.out.println("Destination State: "+getDestinationState()+"\t\t\tDestination District: "+getDestinationDistrict());
    System.out.println("Departure Date & Time: "+getDepartureDateTime());
    System.out.println("Purpose: "+getPurpose());
    String app_status="";
            switch (getStatus()){
                        case -1: app_status="Rejected";
                                 break;
                        case 0: app_status="Pending";
                                 break;
                        case 1: app_status="Approved";
                                 break;
                }
    System.out.println("\nStatus: "+app_status);
    if (!app_status.equals("Pending")){
        System.out.println("\nProcessed by "+handler.getStaff_name());
            System.out.println("\nPosition: "+handler.getStaff_position());
            System.out.println("\nDepartment: "+handler.getStaff_department());
}
}
```

Figure 4.1.3 displayApplicationInfo( ) in class Cross_state

```
360                                 for (int m=0;m<appList.size();m++)
361                                 {
362                                     if (((appList.get(m)).getApplicant()).getApplicant_IcNo().equals(icNo))
363                                     {
364                                         (appList.get(m)).displayApplicationInfo();
365                                         foundApp++;
366                                     }
367                                 }
```

Figure 4.1.4 displayApplicationInfo( ) in main Cross_District_State_Application

4.5 Exception handling

Exception handling can be found in the system with the terms try and catch. In our system, we are using exception handling to trace the invalid input from the user.

```
Run | Debug
public static void main (String []args) throws IOException
{
    Scanner input=new Scanner (System.in);
    System.out.println ("<<< Cross-District Or State Application System>>>");
    System.out.println ("\nBefore the program gets started, you need to initialize the staff first");
    System.out.println ("Please fill in the following information");
```

Figure 4.5.1 Exception handling : IO Exception

```
// Exception handling 1
boolean EH1=true;
do{
try{
System.out.print("\nYour category: ");
optCategory=Integer.parseInt(input.nextLine ());
EH1=false;

System.out.println("\n\n");
}
catch (Exception e)
{
 System.out.println("Your input is not an Integer.Please try again");

}
}
while(EH1);
```

Figure 4.5.2 Exception handling 1

```
boolean EH2;//Exception handling 2
displayApplicantMenu();
do{
    EH2=true;
try{
optApplicant=Integer.parseInt(input.nextLine());
EH2=false;
if (optApplicant!=1&&optApplicant!=2&&optApplicant!=3)
{
    System.out.println("Invalid input...Please try again");
    System.out.print("\nYour operation: ");
}
}
catch (Exception e)
{
    System.out.println("Your input is not an Integer.Please try again");
    System.out.print("\nYour operation: ");

}
```

Figure 4.5.3 Exception handling 2

```
boolean EH3=true;
do{
    // Exception handling 3
    try{
System.out.print("\nApplication type : ");
optType=Integer.parseInt(input.nextLine ());

System.out.println("\n");
EH3=false;
    if (optType!=1&&optType!=2){
    System.out.println("Invalid input...Please try again");
    }
    }
    catch (Exception e){
        System.out.println("Your input is not an Integer.Please try again");
    }
}
```

Figure 4.5.4 Exception handling 3

```
do
{
    System.out.println("\n<<< View Your Application >>>");
    System.out.println("1) Search by Application ID");
    System.out.println ("2) Search by Ic Number");
    System.out.println("3) Return to the previous page");
    boolean EH4=true;
    while (EH4)
    {
        // Exception handling 4
        try{
    System.out.print ("\nChoice (1, 2, or 3): ");
    optForView=Integer.parseInt(input.nextLine());
    EH4=false;


        }
        catch (Exception e)
        {
            System.out.println("Your input is not an Integer.Please try again");
        }
    }
```

Figure 4.5.5 Exception handling 4

```
boolean EH5=true;
while (EH5){
    // Exception handling 5
    try{
System.out.print("\nStaff number: ");
selectStaff=Integer.parseInt(input.nextLine());
EH5=false;

    }
    catch (Exception e)
    {
        System.out.println("Your input is not an Integer.Please try again");
    }
}
```

Figure 4.5.6 Exception handling 5

```
int optStaff=0;
do
{
    boolean EH6;// Exception handling 6
displayStaffMenu ();
do{
    EH6=true;
    try{
    optStaff=Integer.parseInt(input.nextLine());
    EH6=false;
    if (optStaff!=1&&optStaff!=2&&optStaff!=3){
        System.out.println("Invalid input... Please try again");
    System.out.print("\nYour operation: ");}
    }
    catch (Exception e){
        System.out.println("Your input is not an Integer.Please try again");
        System.out.print("\nYour operation: ");
        }
```

Figure 4.5.7 Exception handling 6

```
boolean EH7;
do{
    EH7=true;
    // Exception handling 7
    try{
    System.out.printf("\nEnter the No of the application to be processed: ");
    numtemp=Integer.parseInt(input.nextLine());
    EH7=false;
    if (numtemp<1||numtemp>numPending)
    {
        System.out.println("The No of application is out of range....Please try again");
    }
    }
    catch (Exception e)
    {
        System.out.println("Your input is not an Integer.Please try again");
    }
}
```

Figure 4.5.8 Exception handling 7

4.6 Encapsulation and data hiding

The encapsulation and data hiding concepts can be found in each class. Each class combines the attributes and methods known as encapsulation. Next, data hiding can be seen when we hide the attributes from other objects by using the word ‘private’ or ‘protected’.

```
public class Address{
    private String applicant_street;
    private String applicant_city;
    private String applicant_state;

    Address (String applicant_street, String applicant_city, String applicant_state){···

    public void setAddress(String applicant_street, String applicant_city, String applicant_state){···

    public String getAddress(){···
}
```

Figure 4.6.1 Encapsulation and data hiding concept in class Address

```
public class Applicant {
    private String applicant_name, applicant_IcNo, applicant_gender,applicant_phoneNo,applicant_email,applicant_job;
    private Address applicant_address;
            Applicant.Applicant()
    public Applicant ()···
    public Applicant (String applicant_name, String applicant_IcNo, Address applicant_address, String applicant_phoneNo,
    public void setApplicant_name(String applicant_name) {···
    public void setApplicant_IcNo(String applicant_IcNo) {···
    public void setApplicant_address(Address applicant_address) {···
    public void setApplicant_phoneNo(String applicant_phoneNo) {···
    public void setApplicant_email(String applicant_email) {···
    public void setApplicant_job(String applicant_job) {···
    public void setApplicant_gender(String applicant_gender){···
    public String getApplicant_name() {···
    public String getApplicant_IcNo() {···
    public String getApplicant_address() {···
    public String getApplicant_gender() {···
    public String getApplicant_phoneNo() {···
    public String getApplicant_email() {···
    public String getApplicant_job() {···
}
```

Figure 4.6.2 Encapsulation and data hiding concept in class Applicant

```
public abstract class Application{
    protected Applicant applicant;
    protected Staff handler;
    protected String applicationID;
    protected String application_date;
    protected String application_time;
    protected String purpose;
    protected String transportation_type;
    protected String transportartion_no;
    protected String departure_date;
    protected String departure_time;
    protected int status;
    Application(String applicationID, String application_date, String application_time, String purpose){···
    public void setApplicant(Applicant a){···
    public void assignedToHandler(Staff handler){···
    public void setTransportation(String transportation_type, String transportartion_no){···
    public void setDepartureDateTime(String departure_date, String departure_time){···
    public void setStatus(int status){···
    public int getStatus(){return status;}
    public Applicant getApplicant(){return applicant;}
    public String getApplicationID () {return applicationID;}
    public String getApplicationDateTime(){return application_date+", "+application_time;}
    public String getPurpose(){return purpose;}
    public String getTransportationType(){return transportation_type;}
    public String getTransportationNo( ){return transportartion_no;}
    public String getDepartureDateTime(){return departure_date+", "+departure_time;}
    public abstract void displayApplicationInfo();
}
```

Figure 4.6.3 Encapsulation and data hiding concept in class Application

```
public class Cross_district extends Application{
    private String state;
    private String origin_district;
    private String destination_district;
    public Cross_district(String aID, String aDate, String aTime, String p, String state,
    public String getState(){return state;}
    public String getOriginDistrict(){return origin_district;}
    public String getDestinationDistrict(){return destination_district;}
    public void displayApplicationInfo(){···
}
```

Figure 4.6.4 Encapsulation and data hiding concept in class Cross_district

```
public class Cross_state extends Application{
    private String origin_state;
    private String origin_district;
    private String destination_state;
    private String destination_district;
    public Cross_state(String aID, String aDate, String aTime, String p, String origin_state,
    public String getOriginState(){return origin_state;}
    public String getOriginDistrict(){return origin_district;}
    public String getDestinationState(){return destination_state;}
    public String getDestinationDistrict(){return destination_district;}
    public void displayApplicationInfo(){···
}
```

Figure 4.6.5 Encapsulation and data hiding concept in class Cross_state

```
public class Staff {
    private String staff_name, staff_ID, staff_position, staff_department;
    Vector <Application> applications;

    public Staff (String staff_name, String staff_ID, String staff_position, String staff_department){

    public String getStaff_name() {···
    public String getStaff_ID() {···

    public String getStaff_position() {···

    public String getStaff_department() {···

    public void addApplication(Application application){···

    public void displayApplicationList(){···
}
```

Figure 4.6.6 Encapsulation and data hiding concept in class Staff

5.0 Step by step how to use the cross-district and cross-state application system

*Note: The text surrounded with a yellow rectangle represents user input.

1. At the early stage of the program, users have to initialize staff for the program by entering staff name, ID, position and department.
2. After the staff has been initialized, then the program proceeds to the section for the selection of the user category.

```
<<< Cross-District Or State Application System>>>

Before the program gets started, you need to initialize the staff first
Please fill in the following information

Staff name: Kong Hao Yang
Staff ID: S001
Staff Position: Inspector
Staff Department: Police Station Skudai

Do you still want to add new staff?
Press Y if Yes
Press N if No
Choice: Y

Staff name: Loo Zhi Xuen
Staff ID: S002
Staff Position: Inspector
Staff Department: Police Station Skudai

Do you still want to add new staff?
Press Y if Yes
Press N if No
Choice: N



Please select the following user category
1) Applicant
2) Staff

Or
3) Terminate the program

Your category: 1
```

3. If the applicant is selected, then proceed to the applicant interface. Users can choose to make an application or view their application status.
4. If they choose to make an application, then they have to choose either one of the types of application which is cross-district or cross-state application.
5. After that, enter the required information for the application.

```
<<<< Applicant Interface >>>>>
Please choose the following operations
1) Make a cross-disctrict/state application during Movement Control Order (MCO) period
2) View your application status
3) Return to previous interface

Your operation: 1


<<< Make a cross district/state application >>>
Please select either one of the following types of application
1) Cross-district application
2) Cross-state application

Application type : 1



Please fill in the following information

Name: Ali bin Abu

IC number: 960513135678

Gender (M for Male/F for Female): M



<<< Address >>>
               Street: No.123, Jalan ABC
               City: Skudai
               State: Johor

Phone number: 0123456789

Email address: Ali@gmail.com

Occupation: Postgraduate student
```

```
<<< Information of Application >>>

Application date: 18/06/2021
Application Time: 11.05 pm

Purpose for making this application: To return to UTHM campus

<<< Transportation type >>>
               1) Personal vehicle
               2) Public transport such as Bus and LRT
               3) Flight

Transportation type (1,2 or 3): 1

Please enter the transportation number
For instance

1) Transportation number for personal vehicle=Vehicle's plate Number
2) Transportation number for public transport=Bus Number or LRT Number
3) Transportation number for flight=Flight Number

Transportation number: JH 5078

Please enter your departure date and time

Departure date (DD/MM/YYYY): 23/06/2021
Departure time:
        Please Enter am or pm: pm
        Time in Hour.Minute format: 2.15



<<< Within State >>>
State: Johor
Origin district: Skudai
Destination district: Batu Pahat


Your application is submitted successfully

Your application ID is CD01
```

6. Next, select again the option of making an application and then proceed with cross-state application.
7. Enter the required information for the cross-state application.

```
<<<< Applicant Interface >>>>>
Please choose the following operations
1) Make a cross-disctrict/state application during Movement Control Order (MCO) period
2) View your application status
3) Return to previous interface

Your operation: 1


<<< Make a cross district/state application >>>
Please select either one of the following types of application
1) Cross-district application
2) Cross-state application

Application type : 2



Please fill in the following information

Name: Steven jackson

IC number: 870411075679

Gender (M for Male/F for Female): F



<<< Address >>>
               Street: No.157, Taman No.1
               City: Skudai
               State: Johor

Phone number: 0146816314

Email address: steven@yahoo.com

Occupation: Software engineer
```

```
<<< Information of Application >>>

Application date: 18/06/2021
Application Time: 11.08 pm

Purpose for making this application: To meet his friend at KL

<<< Transportation type >>>
               1) Personal vehicle
               2) Public transport such as Bus and LRT
               3) Flight

Transportation type (1,2 or 3): 3

Please enter the transportation number
For instance

1) Transportation number for personal vehicle=Vehicle's plate Number
2) Transportation number for public transport=Bus Number or LRT Number
3) Transportation number for flight=Flight Number

Transportation number: Mh 356

Please enter your departure date and time

Departure date (DD/MM/YYYY): 26/06/2021
Departure time:
        Please Enter am or pm: am
        Time in Hour.Minute format: 10.30



<<< Cross State >>>
Origin State: Johor
Origin district: Skudai
Destination State: Selangor
Destination district: Kuala Lumpur


Your application is submitted successfully

Your application ID is CS01
```

8. Go to view your application status and there will be 2 methods to search your application which are through application ID or applicant's IC number.
9. Then, proceed with option 1 which is "search by Application ID" and get details of the application by entering application ID.
10. After that, try with option 2 which is "search by IC Number" and the details of the application will be displayed.

```
<<<< Applicant Interface >>>>>
Please choose the following operations
1) Make a cross-disctrict/state application during Movement Control Order (MCO) period
2) View your application status
3) Return to previous interface

Your operation: 2

<<< View Your Application >>>
1) Search by Application ID
2) Search by Ic Number
3) Return to the previous page

Choice (1, 2, or 3): 1
Application ID: CD01

<<<<<<Cross District Application>>>>>>
Name: Ali bin Abu
ICNo: 960513135678
Address: No.123, Jalan ABC, Skudai, Johor
Gender: Male                    Phone No: 0123456789
Email: Ali@gmail.com                    Job: Postgraduate student
Application ID: CD01
Application Date & Time: 18/06/2021, 11.05 pm
Transportation Type: Personal vehicle                   Vehicle No: JH 5078
Origin State: Johor                     Origin District:: Skudai
Destination District:: Batu Pahat
Departure Date & Time: 23/06/2021, 2.15 pm
Purpose: To return to UTHM campus

Status: Pending

<<< View Your Application >>>
1) Search by Application ID
2) Search by Ic Number
3) Return to the previous page

Choice (1, 2, or 3): 2
Ic Number: 870411075679
```

11. Return back to the user category and then now proceed with the staff.

```
<<<<<<Cross State Application>>>>>>
Name: Steven jackson
ICNo: 870411075679
Address: No.157, Taman No.1, Skudai, Johor
Gender: Female                  Phone No: 0146816314
Email: steven@yahoo.com                 Job: Software engineer
Application ID: CS01
Application Date & Time: 18/06/2021, 11.08 pm
Transportation Type: Flight                     Vehicle No: Mh 356
Origin State: Johor                     Origin District:: Skudai
Destination State: Selangor                     Destination District:: Kuala Lumpur
Departure Date & Time: 26/06/2021, 10.30 am
Purpose: To meet his friend at KL

Status: Pending

<<< View Your Application >>>
1) Search by Application ID
2) Search by Ic Number
3) Return to the previous page

Choice (1, 2, or 3): 3
Returning to the previous menu

<<<< Applicant Interface >>>>>
Please choose the following operations
1) Make a cross-disctrict/state application during Movement Control Order (MCO) period
2) View your application status
3) Return to previous interface

Your operation: 3
Returning to the previous menu

Please select the following user category
1) Applicant
2) Staff

Or
3) Terminate the program

Your category: 2
```

12. For the view of staff, they have to select which staff to proceed with the proceeding operations.
13. After that, they can choose to process pending applications or view the applications processed by them.
14. If they choose to process pending applications, then they have to enter an application number in order to select the application that is going to be processed.

```
Please select a staff to proceed with the proceeding operations
1) Kong Hao Yang
2) Loo Zhi Xuen

Staff number: 1



<<<< Staff Interface >>>>>
Please choose the following operations
1) Process pending cross-district/state application during Movement Control Order (MCO) period
2) View applications processed by you
3) Return to previous interface

Your operation: 1

No   App Type            App ID              App DateTime                  Name               IC No              Occupation          Purpose

1    Cross-district      CD01                18/06/2021, 11.05 pm          Ali bin Abu        960513135678       Postgraduate studentTo return to UTHM campus

2    Cross-state         CS01                18/06/2021, 11.08 pm          Steven jackson     870411075679       Software engineer   To meet his friend at KL

Enter the No of the application to be processed: 2

<<<<<<Cross State Application>>>>>>
Name: Steven jackson
ICNo: 870411075679
Address: No.157, Taman No.1, Skudai, Johor
Gender: Female                  Phone No: 0146816314
Email: steven@yahoo.com                 Job: Software engineer
Application ID: CS01
Application Date & Time: 18/06/2021, 11.08 pm
Transportation Type: Flight                     Vehicle No: Mh 356
Origin State: Johor                     Origin District:: Skudai
Destination State: Selangor                     Destination District:: Kuala Lumpur
Departure Date & Time: 26/06/2021, 10.30 am
Purpose: To meet his friend at KL

Status: Pending
```

15. Subsequently, they have to choose to approve or reject the application. Besides that, they are also allowed to cancel the approving/rejecting operation for that application if they enter the application number incorrectly.

```
Do you want to approve or reject this application
1) A for Approve
2) R for Reject
Or
3) C for Cancel this operation

Your decision: C
Canceling this operation

Do you still want to process another application
Press Y if Yes
Press N if No

Your choice: Y

No   App Type            App ID              App DateTime                  Name               IC No              Occupation          Purpose

1    Cross-district      CD01                18/06/2021, 11.05 pm          Ali bin Abu        960513135678       Postgraduate studentTo return to UTHM campus

2    Cross-state         CS01                18/06/2021, 11.08 pm          Steven jackson     870411075679       Software engineer   To meet his friend at KL

Enter the No of the application to be processed: 1

<<<<<<Cross District Application>>>>>>
Name: Ali bin Abu
ICNo: 960513135678
Address: No.123, Jalan ABC, Skudai, Johor
Gender: Male                    Phone No: 0123456789
Email: Ali@gmail.com                    Job: Postgraduate student
Application ID: CD01
Application Date & Time: 18/06/2021, 11.05 pm
Transportation Type: Personal vehicle                   Vehicle No: JH 5078
Origin State: Johor                     Origin District:: Skudai
Destination District:: Batu Pahat
Departure Date & Time: 23/06/2021, 2.15 pm
Purpose: To return to UTHM campus

Status: Pending
```

16. After they have finished processing the application, then they can enter 2 to view the applications processed by them.

```
Do you want to approve or reject this application
1) A for Approve
2) R for Reject
Or
3) C for Cancel this operation

Your decision: A

Do you still want to process another application
Press Y if Yes
Press N if No

Your choice: N

<<<< Staff Interface >>>>>
Please choose the following operations
1) Process pending cross-district/state application during Movement Control Order (MCO) period
2) View applications processed by you
3) Return to previous interface

Your operation: 2
Staff name: Kong Hao Yang
Staff ID: S001
Staff position: Inspector
Staff department: Police Station Skudai

No.  Name          IC No           App Type          App ID      Purpose                  App Date Time          Status
1    Ali bin Abu   960513135678    Cross-district    CD01        To return to UTHM campus 18/06/2021, 11.05 pm   Approved


Press Enter to continue...
```

17. The users can use different staff to perform the proceeding operations for staff.

```
<<<< Staff Interface >>>>>
Please choose the following operations
1) Process pending cross-district/state application during Movement Control Order (MCO) period
2) View applications processed by you
3) Return to previous interface

Your operation: Your input is not an Integer.Please try again

Your operation: 3
Returning to the previous menu

Please select the following user category
1) Applicant
2) Staff

Or
3) Terminate the program

Your category: 2


Please select a staff to proceed with the proceeding operations
1) Kong Hao Yang
2) Loo Zhi Xuen

Staff number: 2



<<<< Staff Interface >>>>>
Please choose the following operations
1) Process pending cross-district/state application during Movement Control Order (MCO) period
2) View applications processed by you
3) Return to previous interface

Your operation: 1
```

```
No   App Type            App ID              App DateTime                Name               IC No              Occupation          Purpose

1    Cross-state         CS01                18/06/2021, 11.08 pm        Steven jackson     870411075679       Software engineer   To meet his friend at KL

Enter the No of the application to be processed: 1

<<<<<<Cross State Application>>>>>>
Name: Steven jackson
ICNo: 870411075679
Address: No.157, Taman No.1, Skudai, Johor
Gender: Female                  Phone No: 0146816314
Email: steven@yahoo.com                 Job: Software engineer
Application ID: CS01
Application Date & Time: 18/06/2021, 11.08 pm
Transportation Type: Flight                     Vehicle No: Mh 356
Origin State: Johor                     Origin District:: Skudai
Destination State: Selangor                     Destination District:: Kuala Lumpur
Departure Date & Time: 26/06/2021, 10.30 am
Purpose: To meet his friend at KL

Status: Pending

Do you want to approve or reject this application
1) A for Approve
2) R for Reject
Or
3) C for Cancel this operation

Your decision: R

Do you still want to process another application
Press Y if Yes
Press N if No

Your choice: N
```

18. The application processed by the other staff will be recorded and can view at the operation of "view application processed by you".
19. Next, select the option for returning to previous interface twice in order to get back to the interface for the selection of the user category and then select the applicant.

```
<<<< Staff Interface >>>>>
Please choose the following operations
1) Process pending cross-district/state application during Movement Control Order (MCO) period
2) View applications processed by you
3) Return to previous interface

Your operation: 2
Staff name: Loo Zhi Xuen
Staff ID: S002
Staff position: Inspector
Staff department: Police Station Skudai

No.  Name               IC No              App Type                App ID             Purpose                    App Date Time               Status
1    Steven jackson     870411075679       Cross-state             CS01               To meet his friend at KL   18/06/2021, 11.08 pm        Rejected


Press Enter to continue...


<<<< Staff Interface >>>>>
Please choose the following operations
1) Process pending cross-district/state application during Movement Control Order (MCO) period
2) View applications processed by you
3) Return to previous interface

Your operation: Your input is not an Integer.Please try again

Your operation: 3
Returning to the previous menu

Please select the following user category
1) Applicant
2) Staff

Or
3) Terminate the program

Your category: 1
```

20. In the view of the applicant, the status of their application will no longer be pending after their application has been processed by the staff.

```
<<<< Applicant Interface >>>>>
Please choose the following operations
1) Make a cross-disctrict/state application during Movement Control Order (MCO) period
2) View your application status
3) Return to previous interface

Your operation: 2

<<< View Your Application >>>
1) Search by Application ID
2) Search by Ic Number
3) Return to the previous page

Choice (1, 2, or 3): 1
Application ID: CS01

<<<<<<Cross State Application>>>>>>
Name: Steven jackson
ICNo: 870411075679
Address: No.157, Taman No.1, Skudai, Johor
Gender: Female                  Phone No: 0146816314
Email: steven@yahoo.com                 Job: Software engineer
Application ID: CS01
Application Date & Time: 18/06/2021, 11.08 pm
Transportation Type: Flight                     Vehicle No: Mh 356
Origin State: Johor                     Origin District:: Skudai
Destination State: Selangor                     Destination District:: Kuala Lumpur
Departure Date & Time: 26/06/2021, 10.30 am
Purpose: To meet his friend at KL

Status: Rejected

Processed by Loo Zhi Xuen

Position: Inspector

Department: Police Station Skudai
```

21. Lastly, the users can terminate the program at the interface for the user category.

```
<<<< Applicant Interface >>>>>
Please choose the following operations
1) Make a cross-disctrict/state application during Movement Control Order (MCO) period
2) View your application status
3) Return to previous interface

Your operation: 3
Returning to the previous menu

Please select the following user category
1) Applicant
2) Staff

Or
3) Terminate the program

Your category: 3



Thank you for using the program
Press any key to continue . . .
```

6.0 Task Distribution

TABLE 6.0 Task Distribution

Category	Task	Person In-Charge
Coding Implementation	Class Cross_District_State_Application	Kong Hao Yang (Leader)
	Class Address	Loo Zhi Xuen
	Class Applicant	
	Class Staff	
	Class Application	See Wen Xiang
	Class Cross_district	
	Class Cross_state	
	Final Compilation and Output Formatting	Kong Hao Yang
Others (Diagrams, Reports and Slides)	Introduction	Loo Zhi Xuen
	The flowchart/ workflow of the cross-district and cross-state application system	See Wen Xiang
	The UML class diagram of the cross-district and cross-state application system	All members
	The implementation of OO concepts in the cross-district and cross-state application system	Loo Zhi Xuen
	Step by step how to use the cross-district and cross-state application system	Kong Hao Yang
	Presentation Slide	See Wen Xiang