Principle of Software Requirements

LAB-3: *Conceptual Model*

Classes and Objects

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Introduction

In this lab we took the requirements from the Use Case "Emergency Plan", from Lab 2, and created a Scenario based on it. We then defined a Software Architecture Conceptual Model, by following the Lab Manual.

Emergency Runway Plan

One of the most important features of the OEA system is how effectively it tackles emergencies. When dealing with various emergencies it is essential to have a plan and ensure that it is properly executed

Emergencies can be categorized as follows:
1. Aircraft related emergencies: these include mechanical failures in the aircraft, collisions, or any other aviation accidents
2. Dangerous goods occurrence
3. Weather
4. Natural Disasters (e.g. earthquakes, tsunami, floods, landslides)
5. Public health emergencies
6. Runway Damage

 Whenever, the system detects any crisis an emergency SOP notification is displayed on the screen to the ATC, the ATC with the help of the system informs the ground staff and emergency alarms along with lights are activated. After this step the system notifies other aircrafts that are scheduled to land or take-off. Local authorities are informed about the situation and a detailed report of the incident is generated by the system that includes the following details: -
1. Date
2. Time
3. Emergency Type
4. Description

After the report is generated, it will be forwarded to the <u>OEA app</u> for further <u>alerts</u>. All ground staff will have to install the OEA app. The app will be a part of the system and will display the alert message to all ground staff in-case of an emergency. This would be similar to the AMBER alert system. The alarm sound will blare at full device volume for 10 seconds. The notification shall stay on screen until the situation is resolved.The alert message shall contain the following:

1. Type of emergency
2. Which emergency services teams should be on high alert

   Emergency team consists of :
   - Fire Fighters
   - Police
   - Medical Team

3. Runway and aircraft tail number on which incident has occurred (if applicable).
4. A brief description of the situation.

To ensure security only users with valid <u>ID, password and username</u> can access the system as well as the app.Along with the report a checklist needs to be completed by a controller who is logged in. This <u>checklist</u> consists of the following: -

1. <u>Issue warning</u>
2. <u>Status </u>(true if the situation is resolved or false if the situation is not yet resolved)

Noun Phrases Table

Noun Phrases	Object	Attribute	Actors	Irrelevant
Emergency	Potential object			
Alerts	Potential object			
OEA System	Important concept			
OEA app, Emergency team,ATC, Local Authorities, Ground Staff	Can behave as users		Important actors	
Checklist	Potential Object			
Report	Potential object			
Date,Time, Emergency Type,Description		Attributes of report and alerts		
Issue warning , location , status		Attributes of checklist		
User	Potential object			
Level, runway and aircraft number, team		Attribute of alert		

assigned(A,B,C)			
Alarms , lights		Attributes of OEA system	
Earthquakes, Tsunami, Floods, landslides			Irrelevant (examples)
ID, password, username		Attributes of user	Irrelevant (examples)

Conceptual Class (Draft)
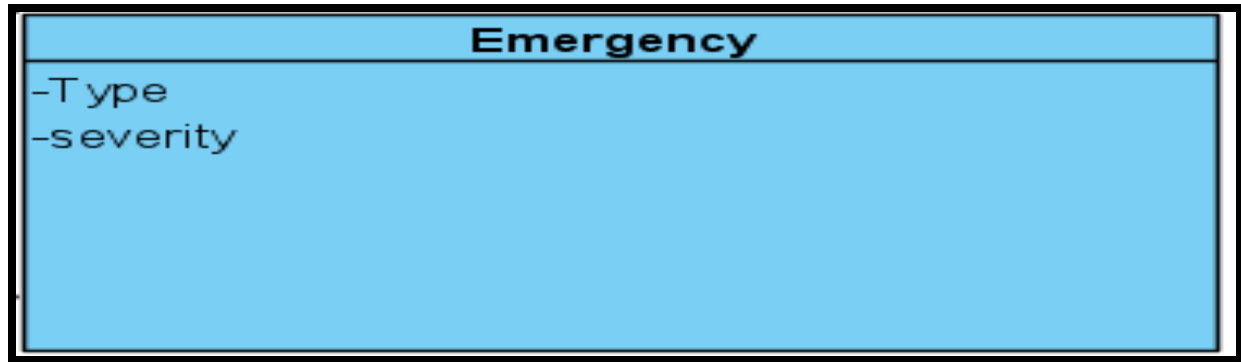


```
                        OEA System
-Alarm
-Lights
-Status
-name
-ID
-password
```
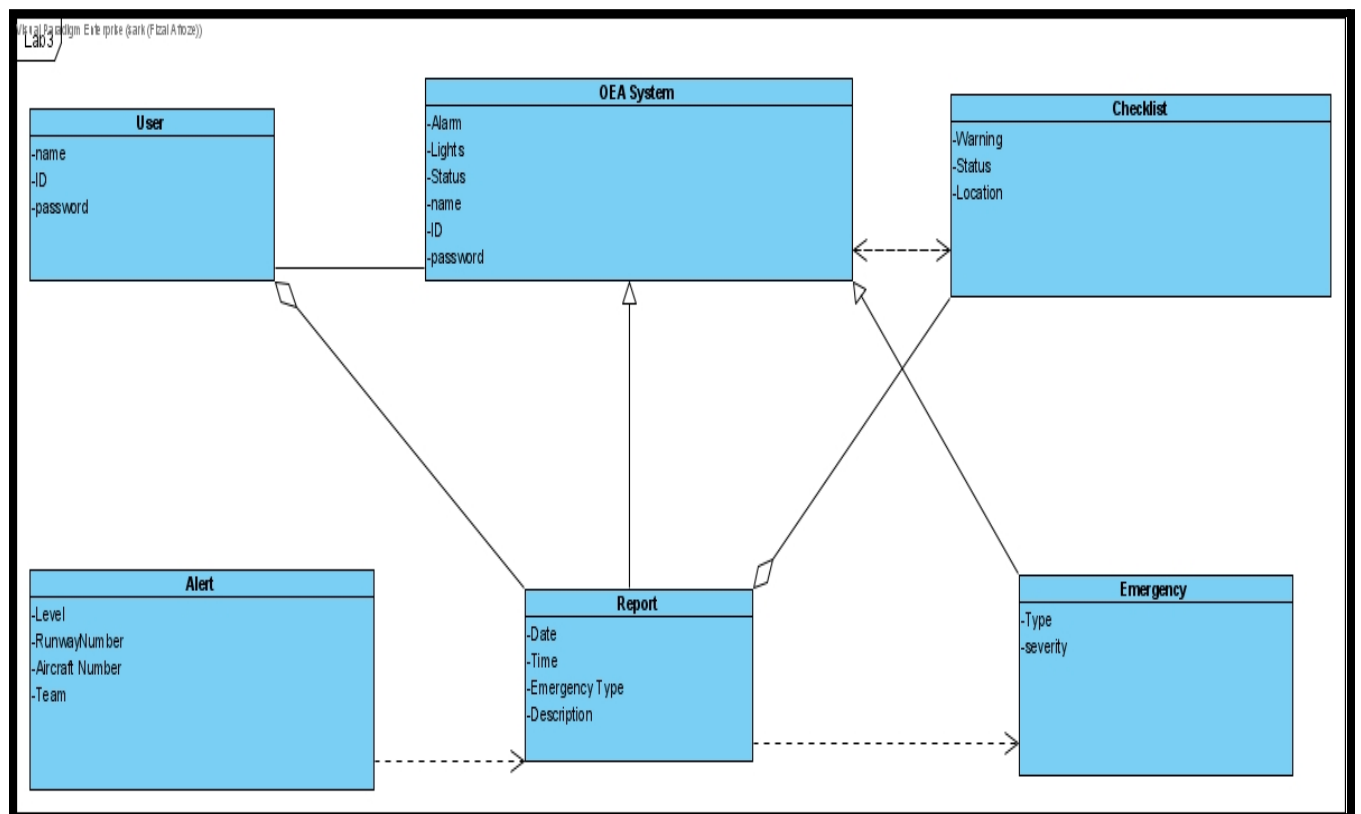
Report

-Date
-Time
-Emergency Type
-Description

Alert

-Level
-RunwayNumber
-Aircraft Number
-Team

Checklist

-Warning
-Status
-Location

User

-name
-ID
-password

Emergency

-Type
-severity

UML Diagram (With Relationships):-

Lab 3

OEA System
-Alarm
-Lights
-Status
-name
-ID
-password

User
-name
-ID
-password

Checklist
-Warning
-Status
-Location

Alert
-Level
-RunwayNumber
-Aircraft Number
-Team

Report
-Date
-Time
-Emergency Type
-Description

Emergency
-Type
-severity

CLASS RESPONSIBILITIES

S.No	CLASSES	RESPONSIBILITIES	COLLABORATORS
1	OEA System	Control all operation and maintain proper flow of data	ALL CLASSES
2	Report	User generates a report using attributes from this class.	1) User 2) Alert
3	Alert	Notify the ground staff about the situation.	1) Report 2) User
4	Emergency	Store the type of emergency and its severity level.	1) User 2) Report
5	Checklist	Allows the user to keep a track of all the steps that are taken and ensure proper SOP guidelines are followed	1) User 2) Report 3) Emergency
6	User	Store information about the user. Information includes name, ID and password	1) System 2) Report 3) Checklist