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## J2EE GROUP ONE PROJECT ON...

# Event Management System

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## GENERAL INTRODUCTION

The Event Management System (EMS) is a web-based application designed to simplify and streamline the planning, organization, and execution of events such as conferences, weddings, seminars, workshops, and concerts. It provides a unified platform where administrators, organizers, and attendees can seamlessly interact to create, manage, and attend events. Built using J2EE technologies (Servlets and JSP), and deployed on a Tomcat server, the system offers features like event creation, attendee registration, payment processing, and real-time communication.

As digital transformation continues to affect every sector globally, the events industry is also evolving. Manual and paper-based event planning methods are rapidly being replaced with digital solutions that improve efficiency, reduce errors, and offer convenience. This EMS aims to deliver a cost-effective, reliable, and user-friendly platform to support both small-scale and large-scale event management.

## RELEVANCE OF THE PROJECT

### Globally

The development of this EMS is essential for the following reasons:

- **Centralized Management:** It allows organizers to manage every aspect of their events from one dashboard — from registration to payments and analytics.
- **Improved User Experience:** Attendees can easily browse upcoming events, register, and make payments securely, all in one place.
- **Time & Cost Efficiency:** Reduces the administrative workload and costs associated with traditional event planning (printing, manual ticketing, logistics).
- **Data & Reporting:** Offers useful insights and analytics for event organizers to evaluate performance, attendance, and finances.
- **Scalability:** Can handle events of all sizes, whether local meetups or national conferences.
- **Security & Transparency:** Tracks payments, registrations, and user data securely, reducing the chances of fraud or miscommunication.

### To Cameroon

Cameroon, like many African nations, is experiencing rapid digital growth. Yet, many event organizers still rely on traditional, often inefficient, methods to plan and execute events. Here's how the EMS can be particularly impactful in the Cameroonian context:

1. **Support for Local Event Planners:** Many local businesses, churches, and youth organizations can use the system to plan events professionally without needing technical expertise.
2. **Digital Inclusion:** Encourages more Cameroonians to adopt digital tools in daily life, aligning with national goals for ICT development.
3. **Entrepreneurship Booster:** The system can empower small businesses and freelance event planners to offer professional services affordably.
4. **Transparency & Record Keeping:** Helps reduce fraud in ticket sales and payment handling, a challenge common in informal event setups.
5. **Multilingual Support:** The system can support both English and French, catering to Cameroon's bilingual population.
6. **Sustainability and Cost Efficiency** – Unlike traditional paper-based guides and in-person tour services, a mobile application offers a **cost-effective, environmentally friendly, and easily updatable** alternative for delivering tourism-related information.

## DIAGRAMS

### USE CASE DIAGRAM

#### a. Definition

Use case diagram shows the functionalities of a system, their interdependencies and how they relate with actors of the system. A use case is a specification of behaviour. The main objectives of the use case diagram are:

- ❖ Provide a high-level view of the system.
- ❖ Identify the functions of the system.

Use case diagrams are completed with a textual description of each use case that is intended to define the use case in greater details

#### b. Formalism

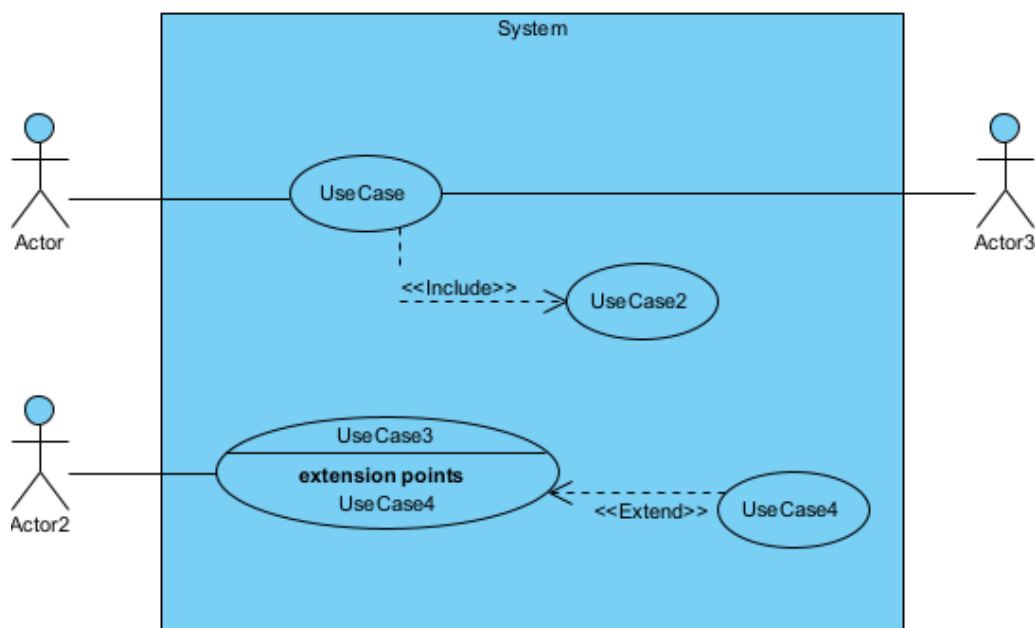


Figure 1: formalism of the use case

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## c. Actors of the System

Table 2: actors of the system

System Actors	
<b>Admin</b>	The user that is in charge of controlling the entire system
<b>Attendee</b>	A user concerned with registering and attending events
<b>Geolocation API</b>	The external system in charge of maps
<b>Organizer</b>	The users in charge of creating and managing events
<b>Payment API</b>	The gateway for payment processing

## d. General Use case

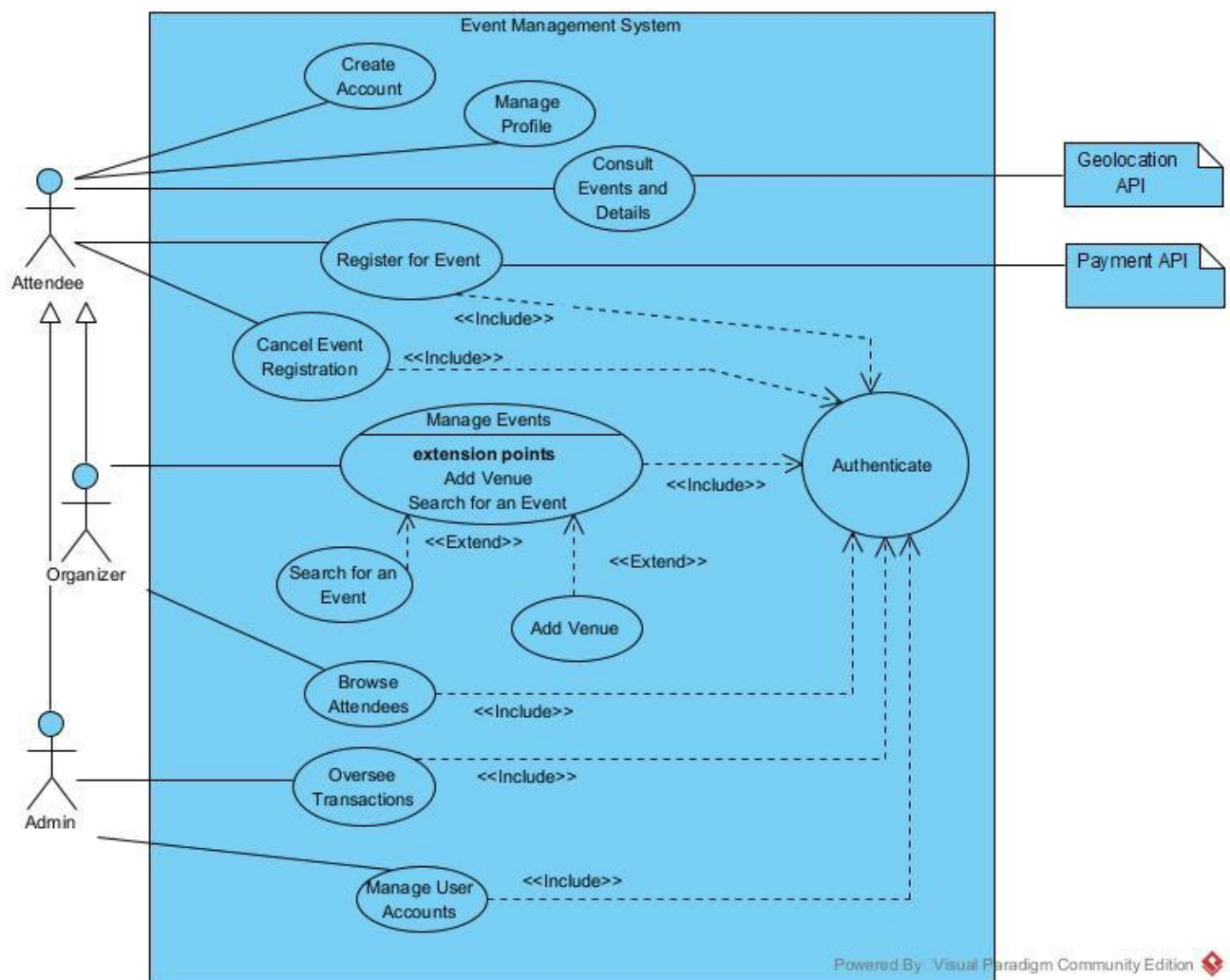


Figure 2: general use case diagram

## TEXTUAL DESCRIPTION

### a. Authentication

Table 3: Authentication textual description

Title	Authenticate
<b>Summary</b>	The user needs to authenticate
<b>Actors</b>	Attendee
<b>Date</b>	April 18, 2025
<b>Stakeholder</b>	System Directors
<b>Version</b>	1.0
<b>Precondition (s)</b>	<ol style="list-style-type: none"> <li>1. The web URL is open in browser</li> <li>2. The actor has an account on the platform.</li> </ol>
<b>Triggers</b>	The user clicks on login button
<b>Nominal Scenario</b>	<ol style="list-style-type: none"> <li>1. The system displays the login form.</li> <li>2. The actor fills and submits the form.</li> <li>3. The system verifies conformity of the form fields</li> <li>4. The system sends the data to the dbms.</li> <li>5. The dbms returns result of the query.</li> <li>6. The system displays a success message to the actor.</li> </ol>
<b>Alternative Scenarios</b>	<ol style="list-style-type: none"> <li>7. At step 4 of the nominal scenario, the user enters mismatched or missing information.</li> <li>8. The system displays an error message then returns to step 2 of the nominal scenario.</li> </ol>
<b>Postcondition of success</b>	The user has access to the homepage of the application
<b>Postcondition of failure</b>	The user does not have access to the platform
<b>Non-functional requirement</b>	Entering the password must not be visible on the screen



## b. Register for Event Use Case

Table 4: Event registration textual description

Title	Explore
<b>Summary</b>	The actor wants to become an attendee for an event
<b>Actors</b>	Attendee
<b>Date</b>	April 18, 2025
<b>Stakeholder</b>	System Directors
<b>Version</b>	1.0
<b>Precondition (s)</b>	<ol style="list-style-type: none"> <li>1. The web app is launched.</li> <li>2. The user has authenticated.</li> </ol>
<b>Triggers</b>	The user clicks on a displayed event
<b>Nominal Scenario</b>	<ol style="list-style-type: none"> <li>1. The system displays the list of events</li> <li>2. The actor chooses an event.</li> <li>3. The system displays the event details</li> <li>4. The Actor clicks on the Register button</li> <li>5. The system checks for validity of the event and sends save query to the DBMS</li> <li>6. The DBMS executes the query and returns the result</li> <li>7. The system displays registration success message</li> </ol>
<b>Alternative Scenarios</b>	<ol style="list-style-type: none"> <li>9. At step 5 of the nominal scenario, The event is not valid or perhaps closed</li> <li>10. The system displays an error message</li> </ol>
<b>Postcondition of success</b>	The user is able to register for an upcoming event
<b>Postcondition of failure</b>	The actor does not register for the event
<b>Non-functional requirement</b>	<ul style="list-style-type: none"> <li>• Entering the password must not be visible on the screen</li> </ul>

## ACTIVITY DIAGRAM

### a. Definition

An activity diagram is a graphical representation of workflows that show the steps needed in the realization of a process; showing the details from a start point to an end point through all decisions and actions that can possibly be performed. Activity diagrams are intended to model both the computational and organizational process. They flow can be sequential, branched or concurrent. Below is an activity diagram formalism.

### b. Formalism

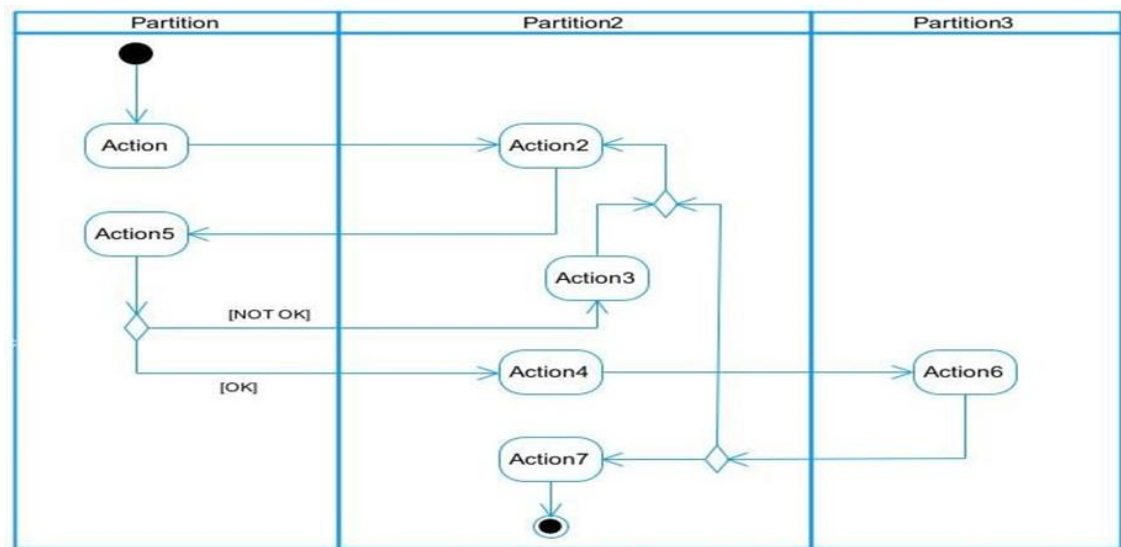


Figure 3: activity diagram formalism

### c. Authentication Activity

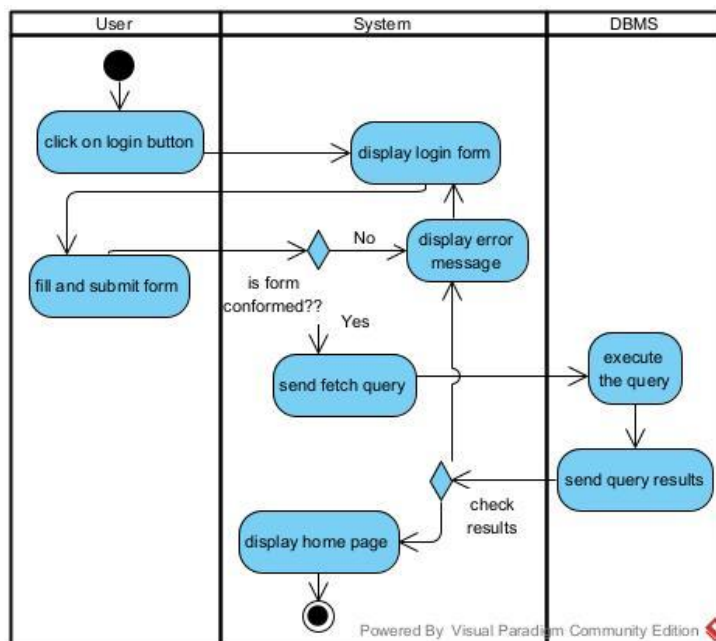


Figure 4: authentication activity diagram

## d. Register for Event Activity

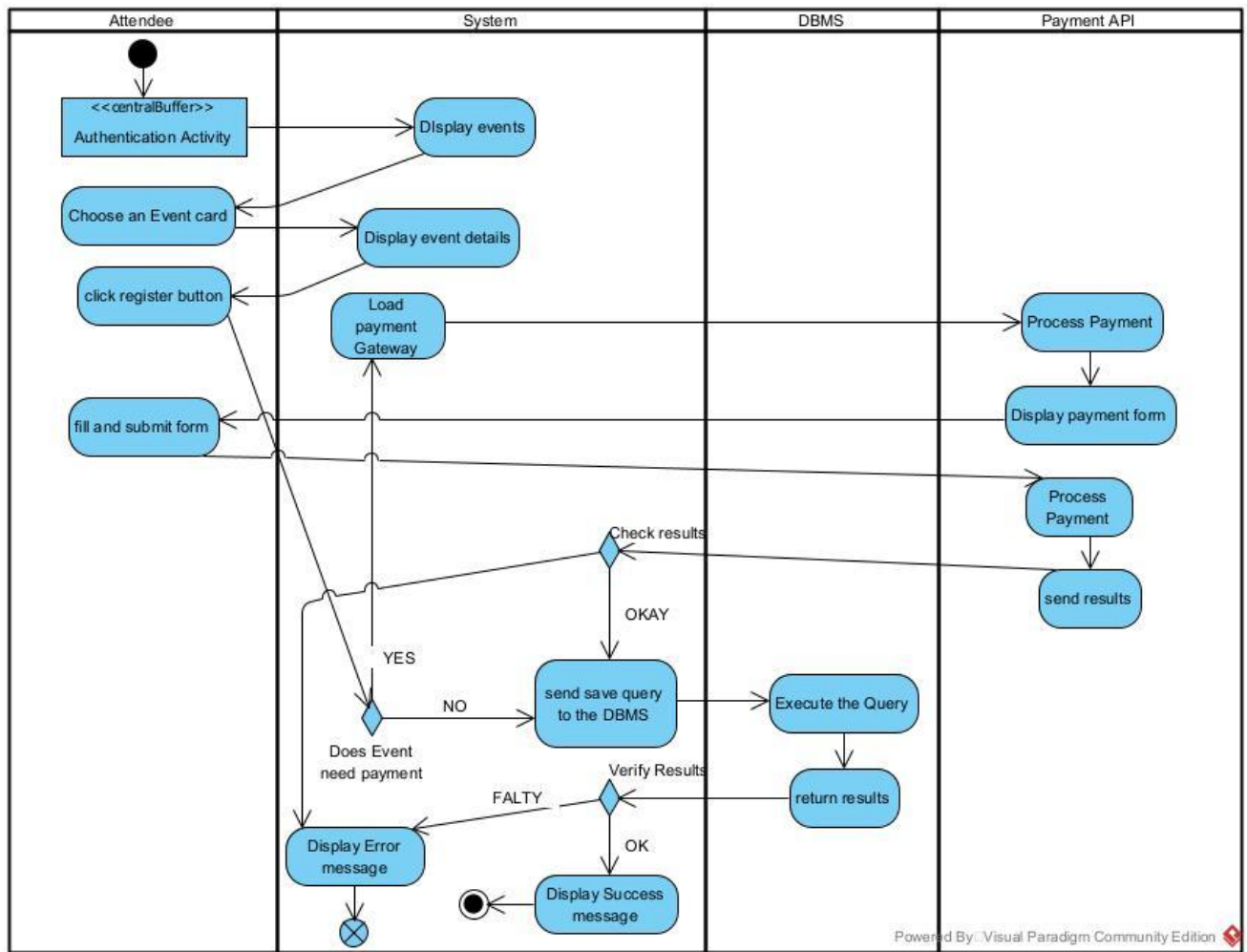


Figure 5: Register for Event activity diagram

## CLASS DIAGRAM

### a. Definition

A class diagram is a static diagram. It represents the static view of an application. class diagram is not only used for visualizing, describing and documenting different aspect of the system but also for constructing executable code of the software application. Class diagram describes the attribute and operation of a class and constraints imposed on the system. Its purpose is to model the static view of an application.

### b. Formalism

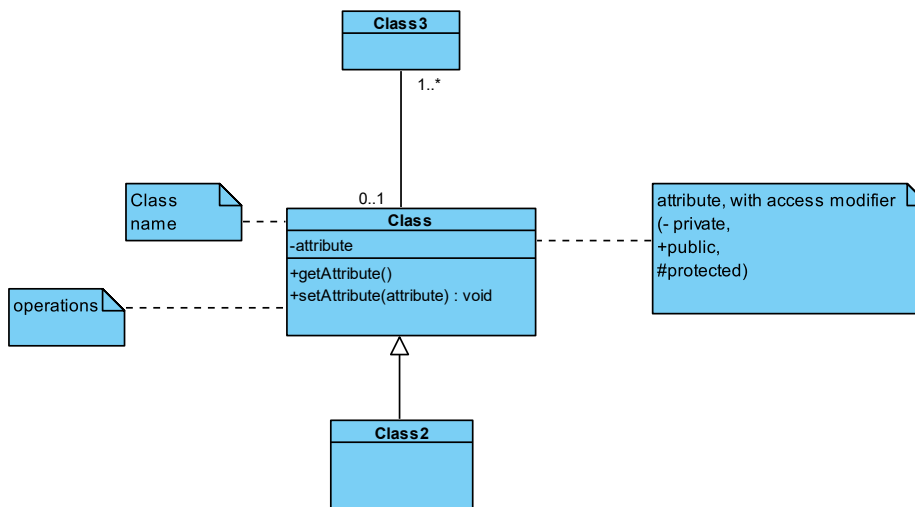


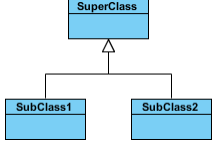
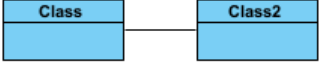
Figure 6: class diagram formalism

### c. Components of A class Diagram

Table 1: components of a class diagram

Element	Diagrammatic Representation	Description
Class		A class is an element that defines the structure and behaviours that an object can possess.
Aggregation		If the parent of the aggregate is deleted, usually the children are not deleted.
Composition		If a parent of a composite is deleted, usually, all its parts are deleted with it.
Dependency		It exists between two classes, where a change in one influence the other.

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Generalization		It's a relationship between a whole class (called superclass) and a more specific class (called subclass)
Association		It is a general type of relationship between elements, it may include cardinality, roles etc.

## d. System Class Diagram

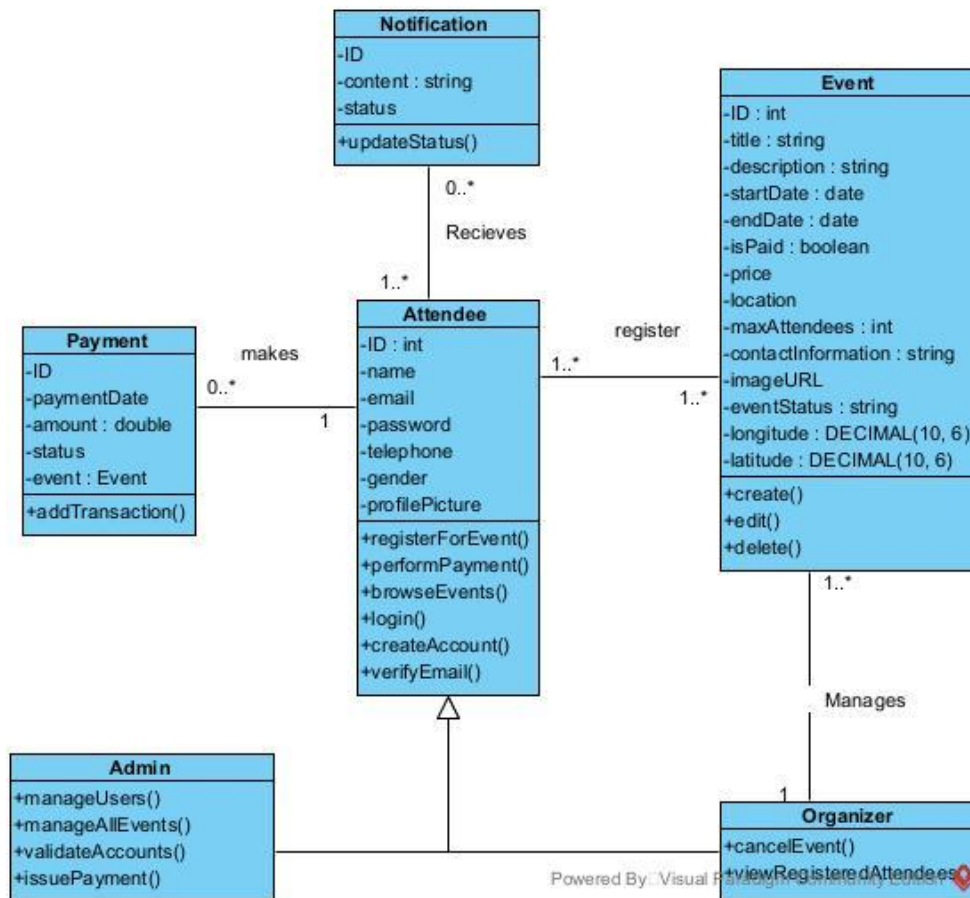


Figure 7: System class Diagram

## e. Business Rules

R1: An Attendee registers for one or more Events and an Event is booked by one or many attendees.

R2: An Organizer manages (creates, updates, deletes) one or many events and an event is managed by only one organizer.

R3: An Attendee makes a payment for payable events.

R4: An Attendee receives zero or many notifications and a notification can be received by many attendees.

## IMPLEMENTATION STACK

To ensure the system is scalable, secure, and efficient, the following technologies and tools will be used in the development of the Event Management System:

### a. Backend:

- *Language:* Java (J2EE)
- *Frameworks/APIs:* Servlets, JSP (Java Server Pages)
- *Server:* Apache Tomcat
- *Database:* MySQL
- *JDBC:* For database connectivity
- *Email Service:* JavaMail API for sending confirmations, invites, etc.

### b. Frontend:

- *Technologies:* HTML5, CSS3, JavaScript
- *Libraries/Frameworks:* Tailwind CSS (for responsive design), jQuery (optional enhancements)

### c. Authentication & Session Handling:

- HTTP Sessions
- Servlet filters for access control

### d. Other Tools:

- *IDE:* NetBeans IDE
- *Build Tool:* Apache Ant (for dependency management)
- *Version Control:* Git (GitHub)

## IMPLEMENTATION MEASURES

### SECURITY

To protect users' data and ensure secure event and payment transactions, the following security measures will be applied:

**a. Authentication & Authorization**

- Role-based access control (Admin, Organizer, Attendee)
- Secure login with encrypted credentials (e.g., using bcrypt or SHA-256)

**b. Input Validation**

- Frontend and backend form validation to avoid SQL injection and XSS attacks

**c. HTTPS (SSL/TLS)**

- Enforce secure communication between client and server to prevent eavesdropping

**d. Session Management**

- Automatic session timeout after inactivity
- Prevent session hijacking using unique tokens

**e. Secure Payment Handling**

- Use of third-party secure payment gateway APIs (e.g., PayPal, Stripe)
- Do not store raw card details in the system

**f. Database Security**

- Prepared statements with JDBC to avoid SQL injection
- Limit database privileges for each connection/user

### REPERCUSSIONS OF AI INTEGRATION

AI can significantly enhance the system in later iterations. Here's how:

**a. Smart Recommendations**

- Recommend events to attendees based on past preferences, location, or trending events

**b. Predictive Analytics**

- Analyze previous event data to predict the number of expected attendees or success probability.

**c. AI Chatbot Assistant**

- Integrate a chatbot to answer attendees' FAQs, help in registration, and guide them through the platform.

**d. Fraud Detection**

- Use machine learning to detect unusual payment patterns or suspicious user behavior.

**e. Content Generation**

- Help organizers generate event descriptions, emails, or social media captions using natural language processing (NLP).

## PROJECT ILLUSTRATIONS



## CONCLUSION

In a world that is increasingly driven by digital innovation, the need for effective and automated event management tools has never been more pressing. The Event Management System (EMS) proposed in this project represents a significant step toward modernizing how events are planned, organized, and executed — not only simplifying the workflow for organizers and attendees but also bringing transparency, structure, and efficiency to the process.

By leveraging J2EE technologies and a secure, scalable architecture, this system offers a robust solution tailored to real-world challenges, especially within the Cameroonian context where digital transformation is rapidly gaining momentum. With features such as event registration, secure payment integration, role-based access control, and potential AI integration for personalization and optimization, the EMS is more than just a tool — it is a digital assistant for creating memorable experiences.

Beyond its technical merit, this project serves as a foundation for greater innovation, entrepreneurship, and digital literacy. Whether for students, startups, communities, or institutions in Cameroon, the EMS holds the potential to empower users, unlock opportunities, and set a new standard for event planning across the region.

It is our hope that this system not only meets academic requirements but also inspires further development and real-world application.