



Project Review - I

Community Relationship Management Tool for Organizations & Enterprises

Project ID – 11

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INTRODUCTION

- In the recent times, many budding startups and community-based organizations have been on the rise.
- The target audience of these organizations are a mass community of end users. Often, these organizations face difficulty in directly reaching their customers/end users.
- Therefore we have come up with a solution to optimize this process and give organizations the maximum control in managing their audience.
- CoRM is a Software as a Service tool to manage community relationships so as to maximise the reach and value of **Community based Organisations**.
- The tool bridges the gap between the end users and organisations who were supposed to be the middlemen till now.

PREVIOUS WORK SUMMARY

Paper Referred	Summary
1. Optimization-assisted personalized event recommendation for event-based social networks	Deployed the “multi-criteria decision making (MCDM) approach” for ranking the events. The preference schemes are built to compute categorical, geographical, temporal and social influences.
2. A Web based-College Event Management System and Notification Sender	Developed a web application to make it easier to attend and run events by enabling remote access with a preferred login. It also allows users to select the date, time, location, and event equipment.
3. Preference and Constraint Factor Model for Event Recommendation	Used the Preference and Constraint Factor Model (PCFM) based on factorization machine model, using attentive mechanism to weight feature interactions and incorporate latent factors of users and contextual features for personalized preference modeling and event recommendation.

PREVIOUS WORK SUMMARY

Paper Referred	Summary
4. Prediction System of Event Attendance in an Event-Based Social Network	Provided better planning and coordination methods for the organization of events, and also provided possible research directions for event attendance prediction in EBSN.
5. Event Management System	Improved the efficiency of conducting and managing events by Automating event implementation, event collaboration, monitoring and management system.

GAPS AND CHALLENGES:

- **Lack of information on computational time:** The context information mentions the need for more focus on computational time, suggesting that the proposed system may have limitations in terms of efficiency
- **Security concerns:** As the system deals with sensitive data, there is a risk of data breaches and unauthorized access if proper security measures are not implemented.
- **Scalability:** The existing systems are difficult to handle huge data and traffic of the users on basis of demand.
- **Technical requirements:** The system requires specific hardware and software components, such as a processor, RAM, database server, and web server, which may incur additional costs.
- **New age features:** The existing systems lack of a separate user profile for organisations, integrated registrations, and incorporated the web application just as an event management platform.

METHODOLOGY

Comparisons of the methodologies used in the existing systems

1. Multi-criteria decision-making (MCDM) approach

- The approach utilises a meta-heuristic algorithm called weight-oriented optimisation to estimate the personalized weights.
- This algorithm is used to optimize the weights by iteratively updating them based on the performance of the recommendation system.
- It considers various factors such as temporal, categorical, geographical, and social influences to compute personalized weights for each criterion.
- It incorporates the use of network context and user preferences to find a suitable presentation technique by taking into account the interactions among users and the produced multimedia content in social media networks to offer event recommendations.
- The effectiveness of the approach is validated by considering indexes of accuracy and errors. The outcomes of these evaluations indicate that the presented scheme is feasible and efficient in providing personalized event recommendations.

METHODOLOGY

Problems with MCDM approach:

- **Lack of information on computational time:** The context information mentions the need for more focus on computational time, suggesting that the proposed system may have limitations in terms of efficiency.
- **Limited evaluation information:** The context information does not provide details about the specific evaluation metrics used to measure the effectiveness of the proposed system. Without this information, it is difficult to assess the system's performance and compare it to other existing approaches.

METHODOLOGY

Comparisons of the methodologies used in the existing systems

2. Preference and Constraint Factor Model

- A personalised event recommendation framework has been proposed that exploits the geographical, social and temporal influences of events on users to generate personalised event recommendations.
- The Preference and Constraint Factor Model uses the factorisation machine model to capture feature interactions and extract the above mentioned influences on users by using the Kernel Density Estimation (KDE) model.
- The KDE method is based on three factors: Geographical influence modeling, Social influence modeling, Temporal influence modeling.
- The PCFM Model integrates Personalized Attentive Mechanism for personalized feature interaction. The model takes advantage of contextual information, such as venue and start time, to capture the spatial and temporal constraints on users' event participation behaviors.

METHODOLOGY



Problems with PCFM approach:

- The use of contextual information in event recommendation algorithms relies on accurate and up-to-date data. If the data is incomplete or outdated, the recommendations may not be relevant or useful to users.
- Privacy concerns may arise when using contextual information, such as location and attendance history, in event recommendation algorithms. Users may be hesitant to share this information, potentially limiting the effectiveness of the recommendations.

METHODOLOGY

Comparisons of the methodologies used in the existing systems

3. Event attendance prediction mechanism

- The three essential steps in the EBSN event attendance prediction framework are data collection, preference extraction, and prediction generation.
- **Data collection:** Relevant data such as user information, event details, and contextual information are collected. **Preference extraction:** The contextual information is analyzed to determine its influence on user participation in events. User preferences are extracted based on this contextual information.
- **Prediction generation:** Using known user preferences and key contextual information, predictions are generated for potential preferences between users and events. Effective methods are used to produce accurate prediction results.
- The critical technologies for EBSN event attendance prediction include mining contextual information, user preference acquisition, prediction algorithms, data set evaluation, and user information security.

METHODOLOGY

Problems with Event attendance prediction approach:

- **Data sparsity and cold start issues:** Newly created events or newly joined users pose a cold start problem, where there is limited historical data to base predictions on.
- **Complexity of preference extraction:** Extracting user preferences from contextual information can be a complex task.
- **Privacy and security concerns:** Users face privacy and security concerns and be reluctant to share sensitive data or have concerns about data misuse.

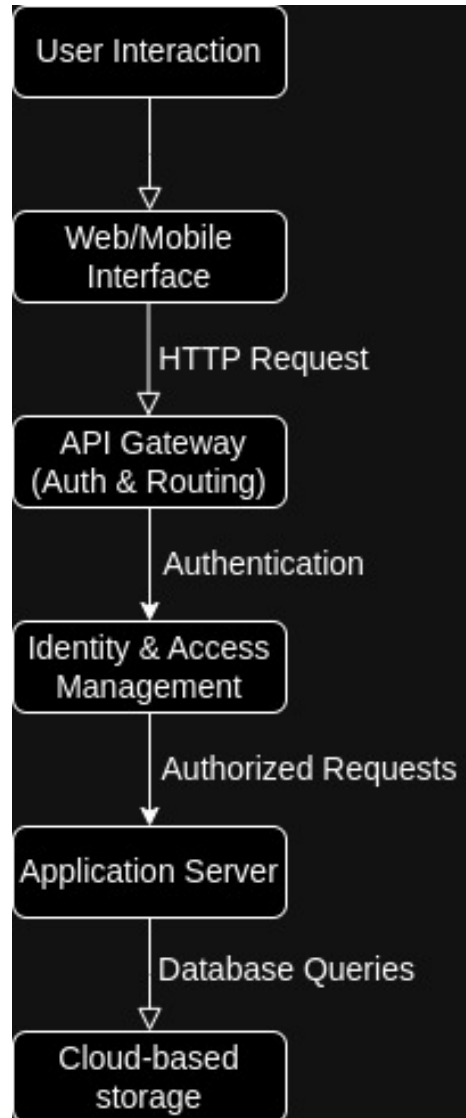
Hybrid Approach for our CoRM Tool

- We propose a solution by following a hybrid approach where in we will incorporate the best existing algorithm for personalized event recommendation and our new methodologies to create new features.
- The approach that we will be using for event recommendation is the “Multi-criteria decision making approach”.
- Our proposed methodology that will be incorporated with the MCDM approach will be developing a Software as a Service tool which is a Community Relationship Management platform to maximise the reach and value of **Community Based Organisations**.
- The application will be using cloud principles which will make it a SaaS and a cloud native application.
- The existing systems have only implemented web apps as of now due to which the gaps they had included **scalability, lower computation speed, security concerns, infrastructure and other technical requirement issues** which will be effectively managed by cloud environment.

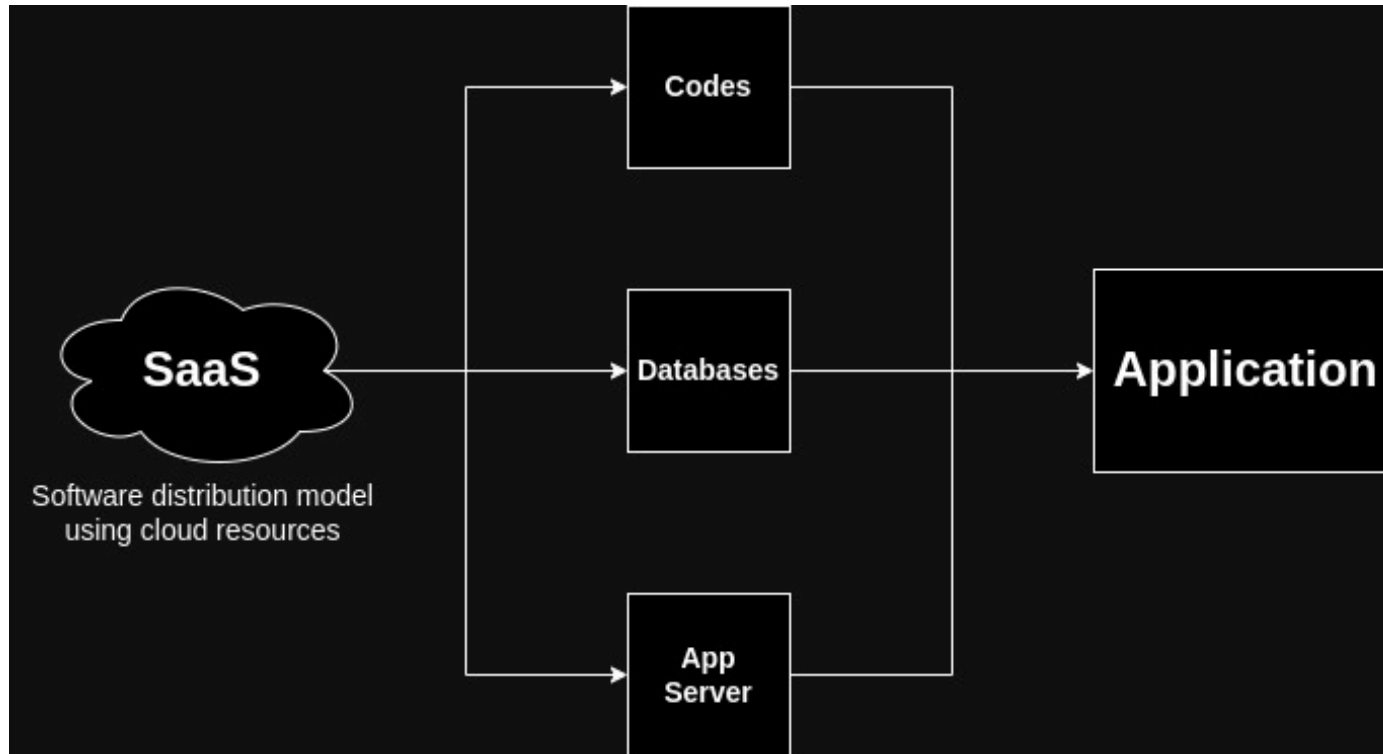
High-level Design Components of CoRM

- The platform encapsulates many innovative features to bridge the gap between community members and organisations.
- **Streamlined Event Management Workflow:** Dedicated interface/platform to showcase, manage, analyse, and promote the events of an organisation for community members and eliminates third party middleware.
- **Organization Portfolio Development:** Maintains a portfolio that is timely tracked and the metrics like events conducted, community members etc is shown visually
- **Collaborative Opportunity Portal, Organisation Team Management** are other features of the SaaS tool.
- Thus the CoRM tool gives organisations more access over the platform while incorporating scalability, flexibility and portability.
- Cloud Computing Services will be used along with Web Frameworks, APIs, and Preference & Constraint Factor Model & other ML frameworks for event recommendation.

CoRM Application WORKFLOW



CoRM Architecture Diagram



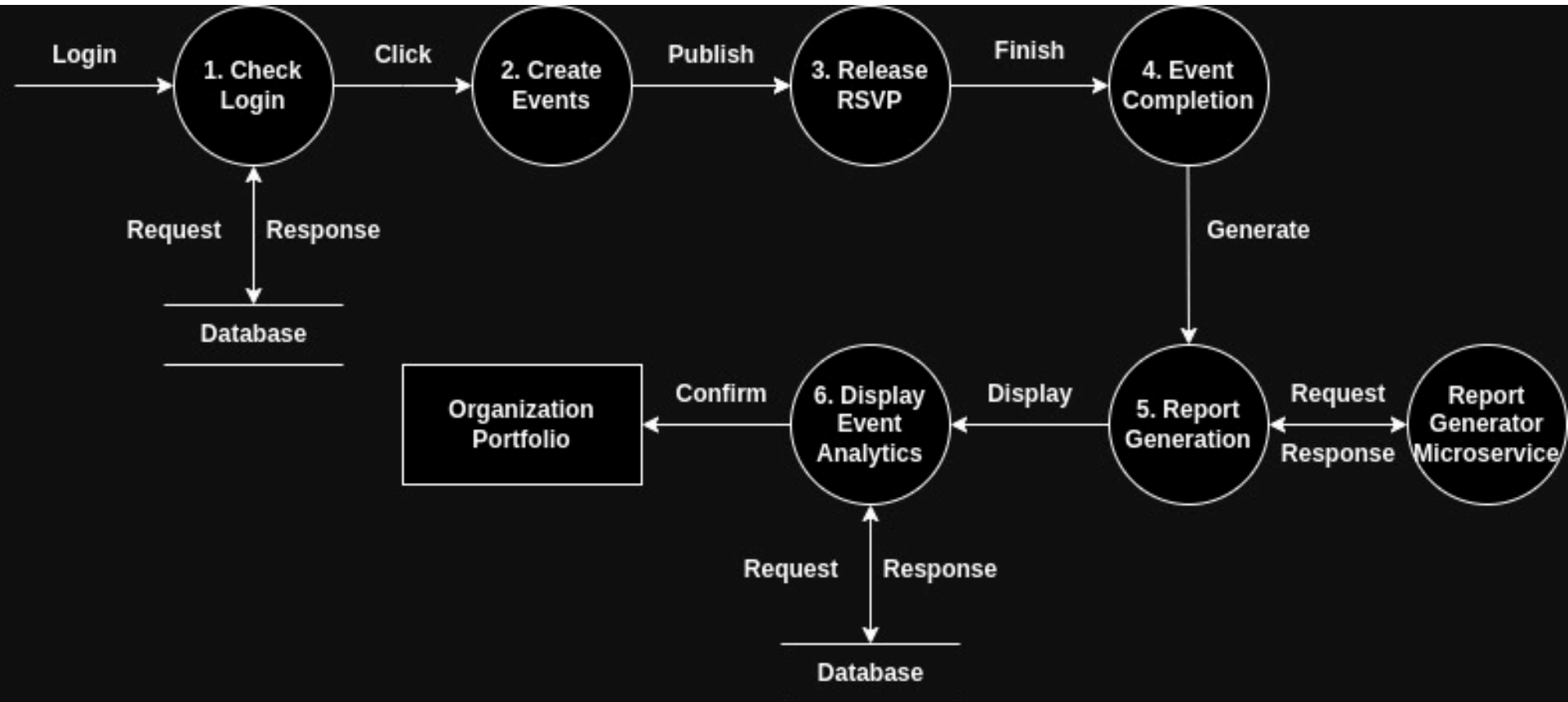
UML DIAGRAMS

1. Data Flow Diagram:

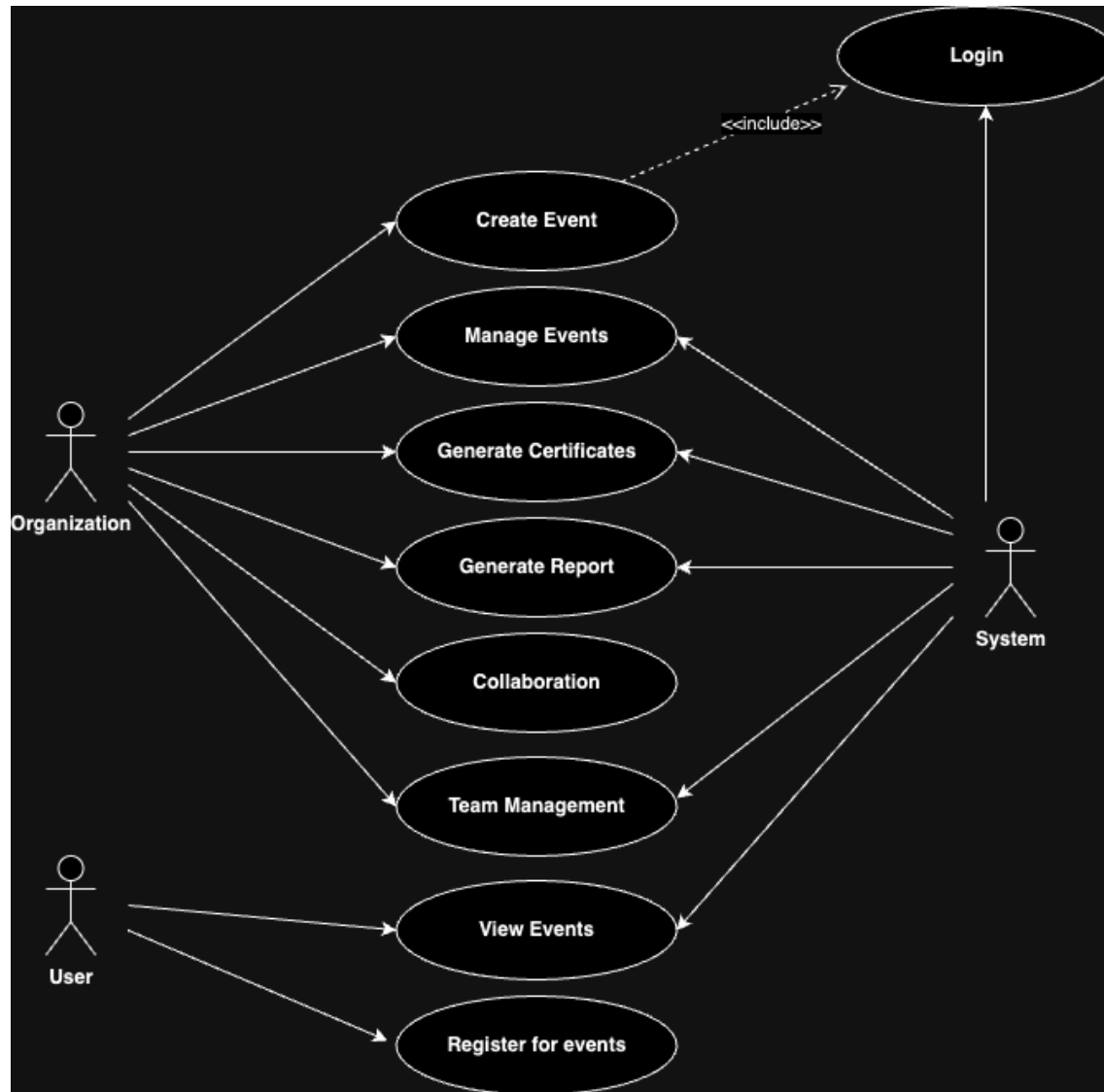
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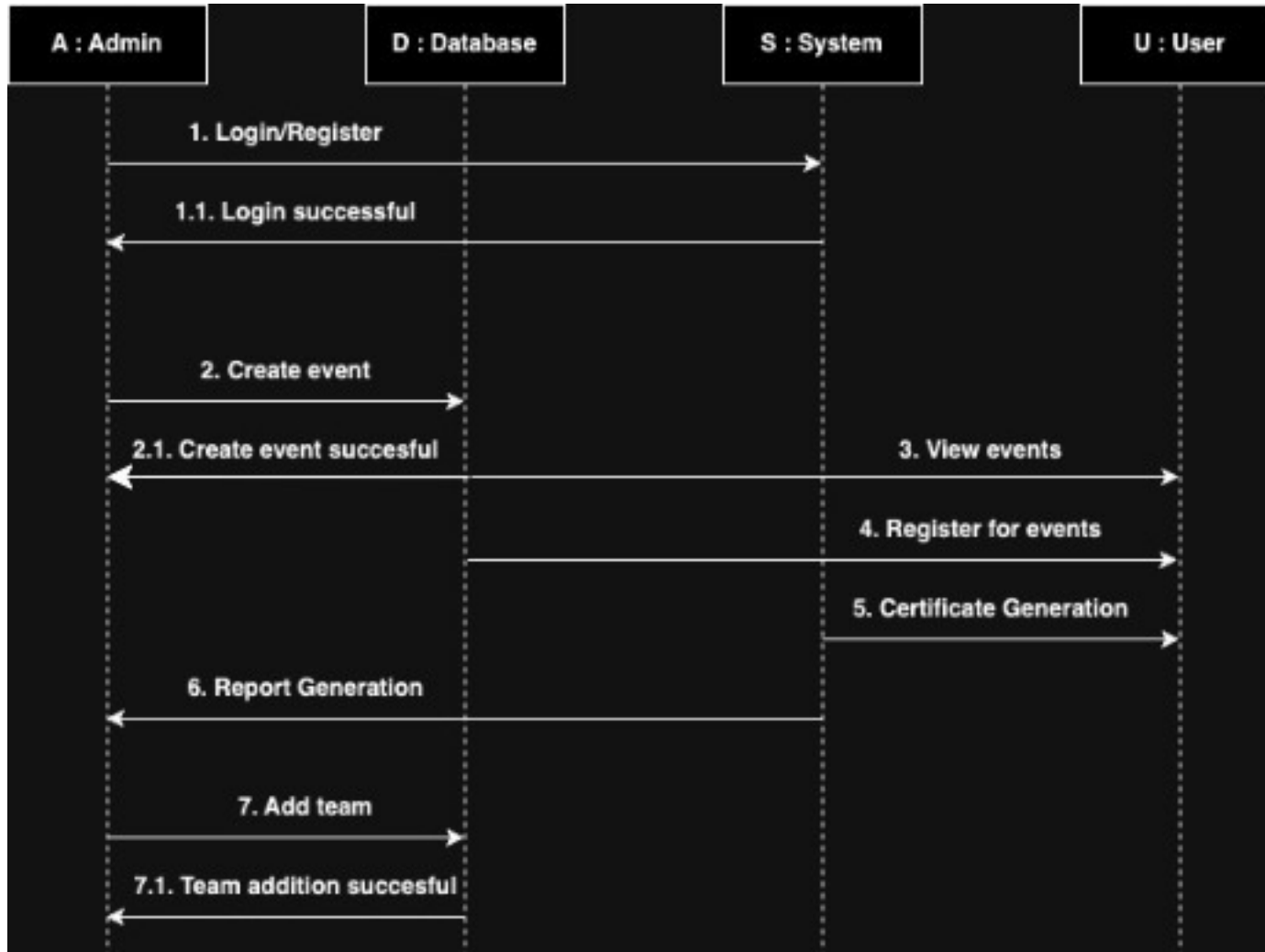
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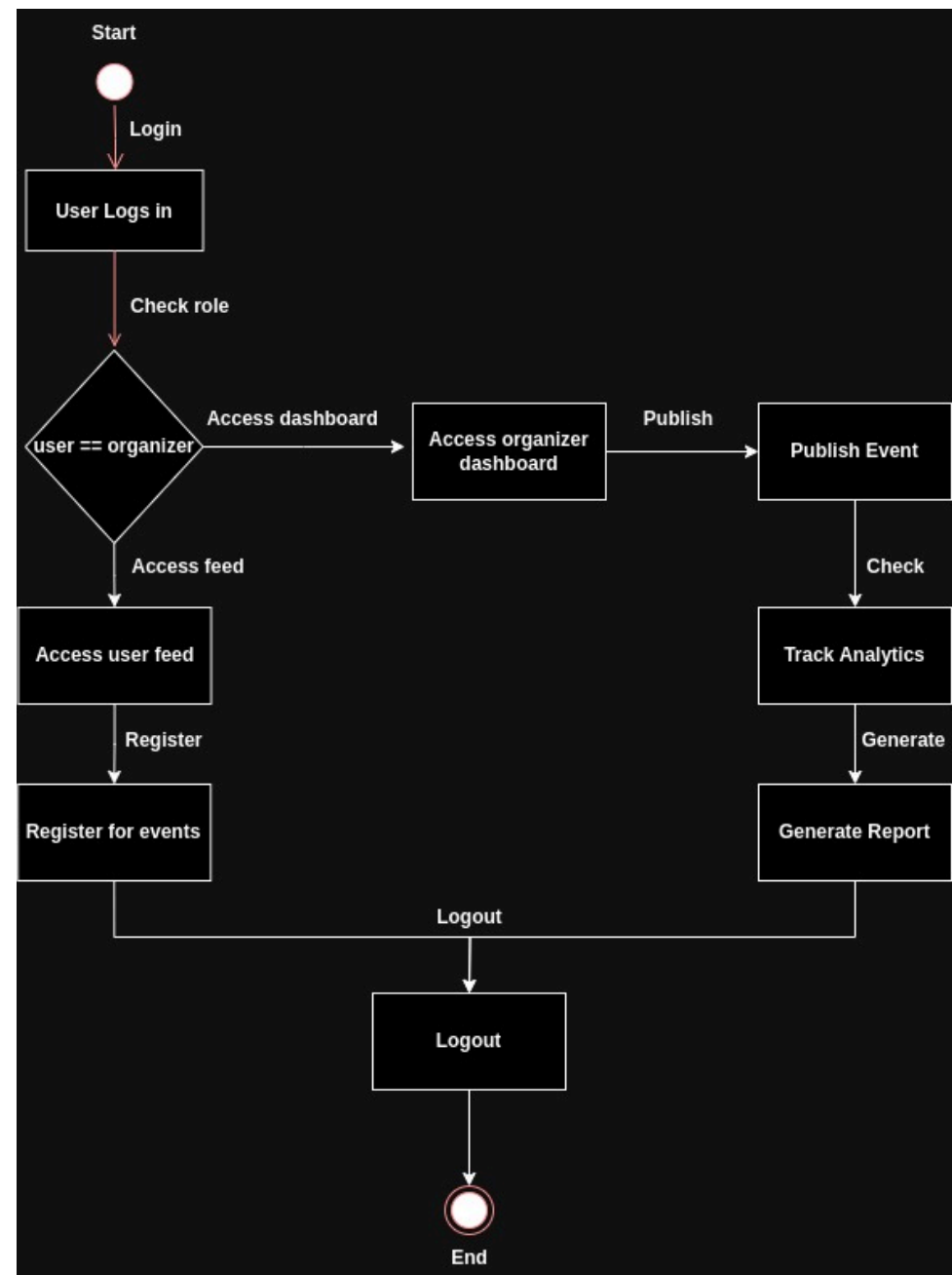
2. Use Case Diagram:



3. Sequence Diagram:



3. Activity Diagram:



CONCLUSION

- In conclusion, our Community Relationship Management platform is a product of high scope in the market.
- The CoRM tool gives the organisations more access over the platform and not just mere publishing events.
- The project involves applications of many domains like Cloud Services - SaaS (for application with high scalability), Web Frameworks & APIs, Micro-services, and few ML algorithms (for event recommendation, etc.) that help in designing a scalable, flexible, reliable and a cost effective solution.
- Finally, it serves as a niche for ‘community-based organisations’ to engage with and manage their target community for mutual development.

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Any Queries?

Thank you