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Course: **Software Engineering**

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Aim:

To design a UML diagram and a Class diagram for Streamlining Business Processes

Problem Statement:

Modeling consumer data to customize regional services, optimize the supply chain and increase customer satisfaction.

An E-commerce company which requires optimal answers based on customer and vendor data. This data is uploaded in a CSV file. The backend algorithm analyses this data to provide recommendations. The results are maintained and frequently updated on the software by the developers. The clients can add more accounts as their linked clients. These linked clients can access the data of that respective company only. Develop a recommendation model to manage the streamlining of the business processes

Use Case Diagram

Use Case Description:

Table 1: List of Actors

Actors	Description
New/Unregistered Client	Unverified E-commerce clients trying to sign-in to our platform.
E-commerce platform client	Registered and verified E-commerce client.
Linked E-commerce platform client	Another account of the same E-commerce company is also logged in and verified.

Table 2: List of Use Cases

#	Use Case	Description
UC1	Sign Up	Allows to register with the platform and verify details to use the recommendation model.
UC2	Login	Platform lets the user login to avail of the services.
UC3	Link Another Account	The client can link multiple accounts to view the result.
UC4	Viewing Analytics	Platform allows you to view and downloads the results.
UC5	Customer Data Upload	Client uploads the customer-specific details in a .csv file.
UC6	Vendor Data Upload	Client uploads the vendor-specific details in .csv file

Table 3: UC1 – Sign-Up

Use Case	UC1. Sign-Up
Description	E-commerce clients sign into our platform and are verified using the GST number and then our SMTP server verifies their email by sending an onboarding link. We verify mobile numbers by OTP. We store this information on the Django Backend.
Actors	New/Unregistered clients
Pre-Conditions	The client company should be registered with the relevant authorities and should be eligible for sharing the customer data legally.
Post-conditions	A new account is created.
Mainline Scenario	1. The user clicks on "*Sign Up Now*" on the homepage. 2. The user fills in the details and submits the form. 3. The system initiates the verification process. 4. An online OTP-based verification, followed by a cross-check with the registrar is done. 5. Following approval, the account is activated. 6. The user can now login into the system.
Alternative Flows	Step 3: The system fails to authenticate the actor. Step 5: The system informs the actor and doesn't allow the actor to proceed to log in.

Table 4: UC2 – Login

Use Case	UC2. Login
Description	Clients can log into their account with proper credentials and a session using cookies is started.
Actors	E-commerce platform client
Pre-Conditions	The client company should be registered with the website previously after having done and verified all the relevant procedures and documents.
Post-conditions	Actor gets logged in.
Mainline Scenario	1. The actor enters the system. 2. The system starts a session. 3. The actor chooses to log in to the account. 4. The system asks for credentials. 5. The system acknowledges that the actor is logged in.
Alternative Flows	Step 3: The actor chooses not to log in to the account Step 4: The system fails to log in to the actor. Step 5: The system informs the actor

Table 5: UC3 – Link Another Account

Use Case	UC3. Link Another Account
Description	Clients may want other members from their team on board our platform or want other partner companies to be linked to their accounts. We provide an invite feature to the client to help its members onboard.
Actors	Linked Ecommerce platform client
Pre-Conditions	The client should be registered on the website and must have the company details verified.
Post-conditions	New account is created and an invitation email is sent.
Mainline Scenario	1. The actor logs into the system 2. The system starts session 3. The actor chooses to invite/ link another account 4. The system asks to enter the company details and verifies or enters or provides the email address of his team members. 5. The system acknowledges that the account is added 6. The actor leaves the system
Alternative Flows	Step 1: If the login fails, the actor can refresh and enter the details again Step 2: The system fails to authenticate the actor and doesn't allow the actor to proceed. Step 4: The system fails to create an account. The system informs the actor.

Table 6: UC4 – Viewing Analytics

Use Case	UC4. Viewing Analytics
Description	Clients can view the analysis generated by our system and then download or email it.
Actors	E-commerce platform client
Preconditions	The client must have an account with the system. The centralized database should be running.
Post-Conditions	Actor viewed the previous logs.
Mainline Scenario	1. The actor logs into the system. 2. The system starts a session. 3. The actor selects the account the previous logs need to be viewed. 4. The recommendation and vendor details are fetched from the database and displayed. 5. He can download or email the analysis. 6. The actor logs out from the session.
Alternative Flows	Step 4: If analytics are not ready or no dataset is uploaded the actor is asked to wait for Step 5: Fetching of data from the database failed then an error is displayed.

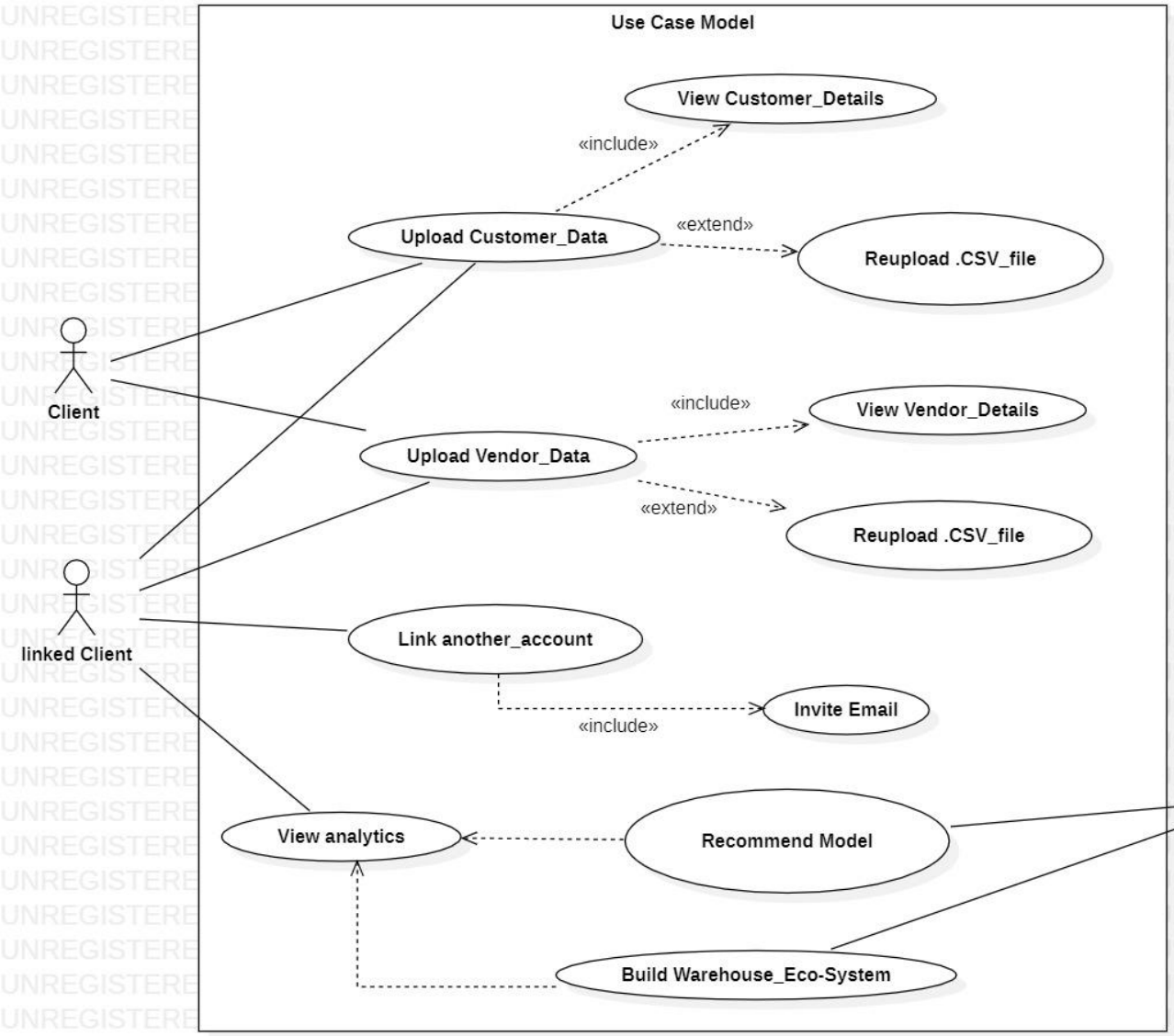
Table 7: UC5 – Customer Data Upload

Use Case	UC5. Customer Data Upload
Actors	E-commerce platform client
Pre-Conditions	The client should be registered, logged in on the website and has an authentic customer dataset in the required format and size.
Post-conditions	Actor downloads the analysis containing the criteria-based recommendations for the given data. Eg: If the criteria is pincode, then for that pincode the relevant recommendation catalogue, based on the highest profitability is generated.
Mainline Scenario	1. The actor logs into the system 2. The system starts session 3. The actor chooses to upload the customer database. 4. The actor enters the filtering criteria 5. The system gets the necessary details from the actor in the form of a CSV file. 6. The system acknowledges that the data is being processed to generate relevant inferences. 7. Actor leaves the system
Alternative Flows	Step 1: The system fails to authenticate the actor. The system informs the actor and doesn't allow the actor to proceed. Step 3: The data to be uploaded is not in .csv format or has some missing data. The system asks the user to upload data again.

Table 8: UC6 – Vendor Data Upload

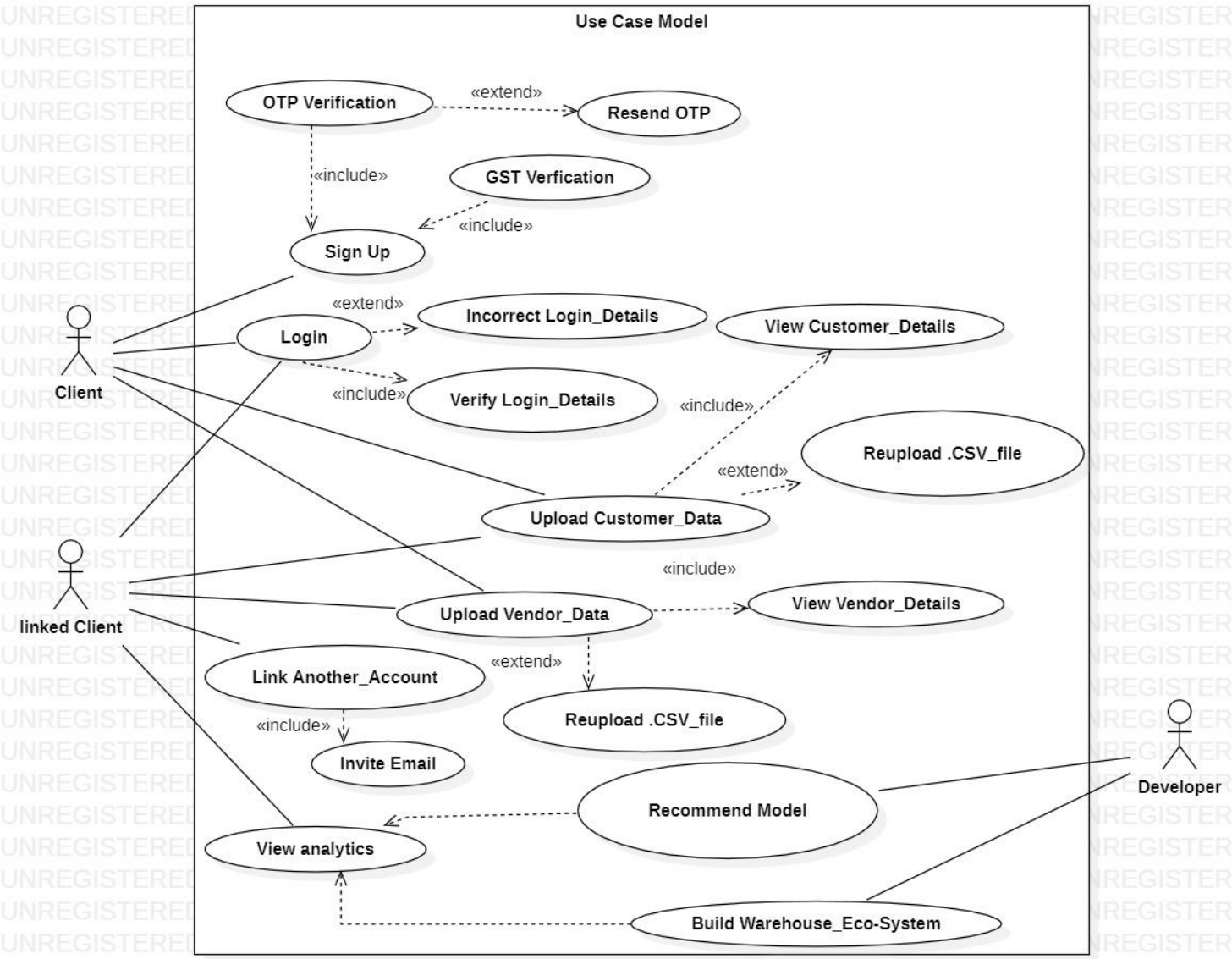
Use Case	UC6. Vendor Data Upload
Actors	E-commerce platform client
Pre-Conditions	The client should be registered, logged in on the website and has a well-organized and curated database of all the vendors in the ecosystem
Post-Conditions	Actor downloads the analysis containing the optimal location to set up the supply chain collection warehouses to maximize profit by cost reduction
Mainline Scenario	1. The actor logs into the system 2. The system starts session 3. The actor chooses to upload the vendor information, which contains the list of all vendors along with the products they manufacture and the pin codes in which they operate. 4. The system gets the necessary details from the actor in the form of a CSV file. 5. The system acknowledges that the data. 6. Actor leaves the system.
Alternative Flows	Step 1: The system fails to authenticate the actor. The system informs the actor and doesn't allow the actor to proceed. Step 3: The system could not read the CSV file. The system informs the actor and approves to re-upload. Step 5: The system fails to acknowledge the data. The system informs the actor and approves to re-upload.

CONCISE USE CASE MODEL



UNREGISTERED

DETAILED USE CASE MODEL



Conclusion:

UML or Unified Modeling Language diagrams can be used as a way to visualize a project before it takes place. It is used to define a standard way to visualize the way a system has been designed. Through UML diagrams, we learned to build use case diagrams and use case descriptions.

CLASS DIAGRAM

Problem Statement:

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An E-commerce company which requires optimal answers based on customer and vendor data. This data is uploaded in a CSV file. The backend algorithm analyses this data to provide recommendations. The results are maintained and frequently updated on the software by the developers. The clients can add more accounts as their linked clients. These linked clients can access the data of that respective company only. Develop a recommendation model to manage the streamlining of the business processes.

Noun/Noun Phrases

Client Companies (users), developers, warehouses, and statistical analysis.

Classes

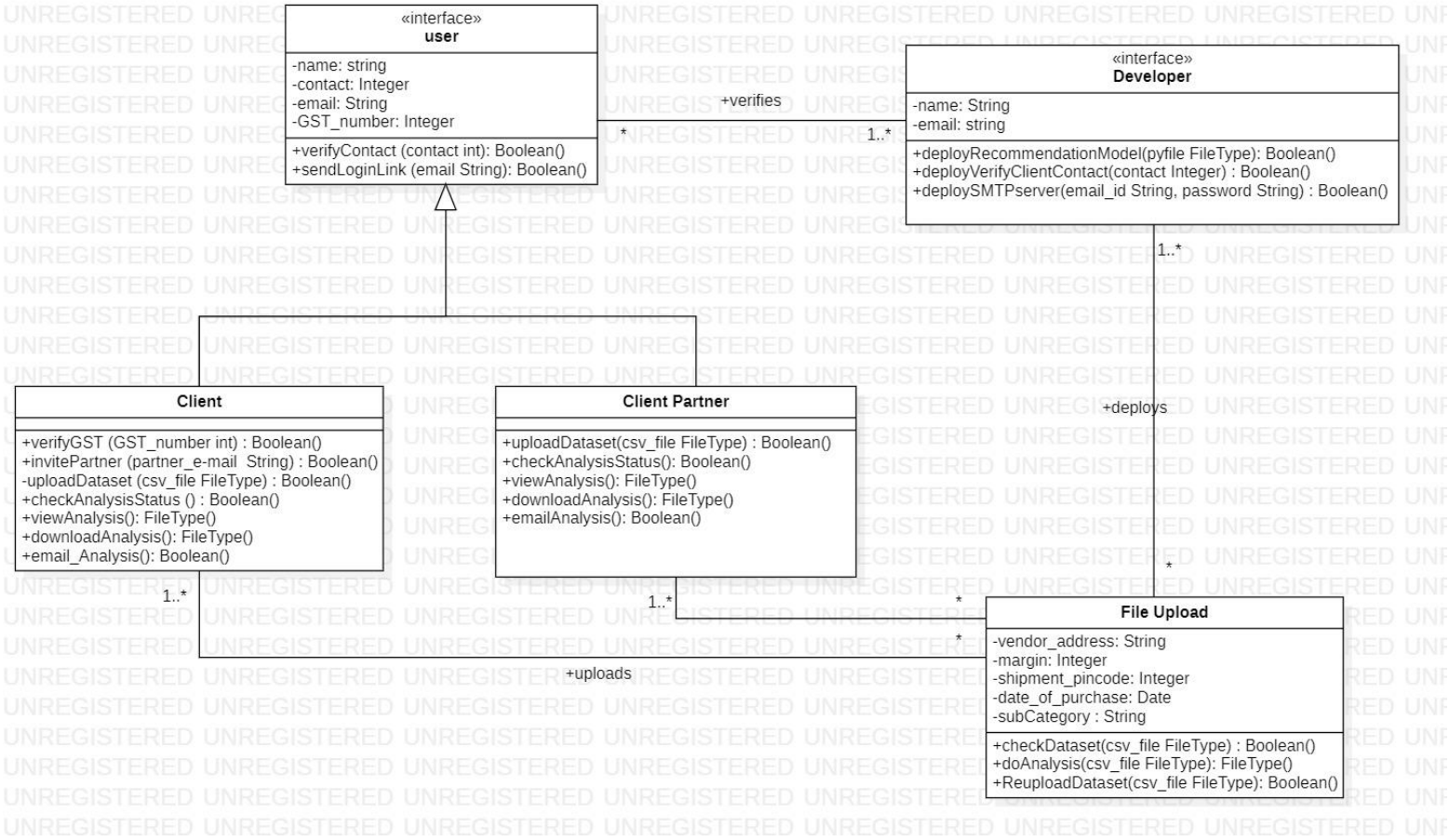
User, Client, Client Partner, File Upload

Verb Phrases

1. The client company has data on customers and vendors.
2. The client company uploads its data in .csv format
3. The backend algorithm analyses the data and provides recommendations.
4. The developers maintain and frequently update the software.
5. The linked clients access data of respective companies.

Relations

1. Client companies and linked client companies are users of the system. Hence we generalize them into user classes.
2. One or more clients can upload many data files.
3. One or more client partners upload many data files.
4. One or many developers can verify many users
5. One or many developers can deploy many data files.
6. The backend algorithm is deployed by many developers.



Conclusion:

The UML Class diagram is a graphical notation used to construct and visualize object-oriented systems. A class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's:

1. Classes
2. Attributes
3. Operations
4. Relationship among objects