

# System Design - Growth

Summer 2021 CSCC01 Project

Jaiteg Sahota | Ronish Bhatt | Yihang Cheng | Zhengyi Zhang | Shashwat Piyush  
Dosh | Naman Bhandari | Pritish Panda

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## Front-End CRC Cards

<p><b>Forum:</b>  Parent class: none  Subclasses: none  Responsibilities:</p> <ul style="list-style-type: none"> <li>- Provides a list of all posts: <ul style="list-style-type: none"> <li>- With the author name</li> <li>- Date posted</li> <li>- Last modified</li> <li>- Post content</li> </ul> </li> <li>- makes posts through a GUI interface when logged in. <ul style="list-style-type: none"> <li>- If user is not logged in, it redirects to a login page</li> </ul> </li> <li>- Allows editing, and deleting posts that are made by the current logged in user</li> <li>- remove it.</li> <li>- Can search for any of the Collaborator models below from a unified search bar</li> <li>- Can sort posts by new, best, top</li> </ul> <p>Collaborations (models):</p> <ul style="list-style-type: none"> <li>- Users</li> <li>- Post</li> <li>- Comment</li> <li>- Reply</li> </ul>	<p><b>Post:</b>  Parent class: none  Subclasses: none  Responsibilities:</p> <ul style="list-style-type: none"> <li>- Provides a single post: <ul style="list-style-type: none"> <li>- With the author name</li> <li>- Post title</li> <li>- Date posted</li> <li>- Last modified</li> <li>- Post content</li> </ul> </li> <li>- makes comments through a GUI interface when logged in. <ul style="list-style-type: none"> <li>- If user is not logged in, it redirects to a login page</li> </ul> </li> <li>- Allows editing and deleting comments that are made by the current logged in user</li> <li>- Can like it</li> </ul> <p>Collaborations (models):</p> <ul style="list-style-type: none"> <li>- Users</li> <li>- Comment</li> <li>- Reply</li> </ul>	<p><b>Comment:</b>  Parent class: none  Subclasses: none  Responsibilities:</p> <ul style="list-style-type: none"> <li>- Provides a list of all comments: <ul style="list-style-type: none"> <li>- With the author name</li> <li>- Date posted</li> <li>- Post id</li> <li>- Comment content</li> </ul> </li> <li>- Stores replies to comments as Reply</li> <li>- Can like it</li> </ul> <p>Collaborations (models):</p> <ul style="list-style-type: none"> <li>- Users</li> <li>- Post</li> <li>- Reply</li> </ul>
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<b>Reply:</b> Parent class: none Subclasses: none Responsibilities: <ul style="list-style-type: none"> <li>- Provides replies to comment</li> <li>- All logged in users able to post reply to any comment</li> <li>- Can like it</li> </ul> Collaborations (models): <ul style="list-style-type: none"> <li>- Users</li> <li>- Comment</li> <li>- Post</li> </ul>	<b>Company Page</b> Parent class: none Subclasses: none Responsibilities: <ul style="list-style-type: none"> <li>- Provide the user with information of their company</li> <li>- For users who have not yet registered a company, have a button to create and enroll in one.</li> <li>- For users who have a company, have a button to edit or remove it.</li> </ul> Collaborations: <ul style="list-style-type: none"> <li>- Users</li> </ul>	<b>Company Photo</b> Parent class: none Subclasses: none Responsibilities: <ul style="list-style-type: none"> <li>- Record Photos uploaded to company page</li> </ul> Collaborations: <ul style="list-style-type: none"> <li>- Company</li> </ul>
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<p><b>Company File</b></p> <p>Parent class: none</p> <p>Subclasses: none</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> <li>- Record Files uploaded to company page</li> </ul> <p>Collaborations:</p> <ul style="list-style-type: none"> <li>- Company</li> </ul>	<p><b>View_profile</b></p> <p>Parent class: none</p> <p>Subclasses: none</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> <li>- User can search for other users</li> <li>- Users can view their profile</li> <li>- User can view other users profiles</li> <li>- A user can only edit his/her profile only</li> <li>- A user can only edit his/her password only though the profile page</li> <li>- A user can message another by clicking the message button in another user's profile page</li> <li>-</li> </ul> <p>Collaborations (models):</p> <ul style="list-style-type: none"> <li>- Users</li> <li>- Chat Room</li> </ul>	<p><b>Dashboard</b></p> <p>Parent class: none</p> <p>Subclasses: none</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> <li>- Users can see the modules they are enrolled in and the assignments in that course</li> <li>- Users can view their profile and an option to my edit their profile on dashboard</li> <li>- Users can use dashboard to start a video chat or group chat</li> <li>- Users can see the number of courses i am enrolled in and other stats</li> <li>- User can get to know of new events</li> </ul> <p>Collaborations (models):</p> <ul style="list-style-type: none"> <li>- Modules</li> <li>- Chat Room</li> <li>- Video chat</li> </ul>
<p><b>Chat Rooms:</b></p> <p>Parent class: none</p> <p>Subclasses: none</p> <p>Responsibilities :</p> <ul style="list-style-type: none"> <li>- Provide text messaging capabilities to users who have access to the application</li> <li>- Users who have logged in can join a particular lobby with a security link/code that will allow them to communicate with other users in the same room</li> <li>- Users can join multiple rooms to communicate with</li> </ul>	<p><b>Navigation-bar:</b></p> <p>Parent class: none</p> <p>Subclasses: none</p> <p>Responsibilities :</p> <ul style="list-style-type: none"> <li>- Allows users to navigate between the homepage , the about us page, login page, and login page</li> </ul> <p>Collaborations :</p> <ul style="list-style-type: none"> <li>- Home page</li> <li>- Login page</li> <li>- About page</li> <li>- Blog Page</li> <li>- African Impact Challenge page</li> </ul>	<p><b>Courses:</b></p> <p>Parent class: none</p> <p>Subclasses: none</p> <p>Responsibilities :</p> <ul style="list-style-type: none"> <li>- Allows instructors to add/create courses. Allow students to enroll in courses.</li> </ul> <p>Collaborations :</p> <ul style="list-style-type: none"> <li>- Home page</li> <li>- Login page</li> <li>- About page</li> <li>- Blog Page</li> <li>- African Impact Challenge page</li> <li>- Users</li> </ul>

<p>different users in the web application</p> <p><b>Collaborations:</b></p> <ul style="list-style-type: none"> <li>- Login</li> <li>- Users</li> </ul>		
<p><b>Modules:</b></p> <p>Parent class: none</p> <p>Subclasses: none</p> <p>Responsibilities :</p> <ul style="list-style-type: none"> <li>- Allows instructors to upload courses modules. Allow students to access modules.</li> </ul> <p><b>Collaborations :</b></p> <ul style="list-style-type: none"> <li>- Home page</li> <li>- Login page</li> <li>- About page</li> <li>- Blog Page</li> <li>- African Impact Challenge page</li> <li>- Courses</li> </ul>	<p><b>Video Chat:</b></p> <p>Parent class: none</p> <p>Subclasses: none</p> <p>Responsibilities :</p> <ul style="list-style-type: none"> <li>- Provide video sharing and communicating capabilities to users</li> <li>- Users who have logged in can join a video conference room to communicate with other users in the same room</li> <li>- Users can share screen and record screen as well</li> </ul> <p><b>Collaborations:</b></p> <ul style="list-style-type: none"> <li>- Login</li> <li>- Users</li> </ul>	<p><b>Calendar:</b></p> <p>Parent class: none</p> <p>Subclasses: none</p> <p>Responsibilities :</p> <ul style="list-style-type: none"> <li>- Provide the calendar functionality for users</li> <li>- Users are able to go to the previous month/next month.</li> <li>- Users can add/modify/delete events on specific date</li> </ul> <p><b>Collaborations:</b></p> <ul style="list-style-type: none"> <li>- Login</li> <li>- Users</li> </ul>
<p><b>Modules Upload:</b></p> <p>Parent class: none</p> <p>Subclasses: none</p> <p>Responsibilities :</p> <ul style="list-style-type: none"> <li>- Allows students to submit courses modules. Allow instructors to access modules.</li> </ul> <p><b>Collaborations :</b></p> <ul style="list-style-type: none"> <li>- Home page</li> <li>- Login page</li> <li>- About page</li> <li>- Blog Page</li> <li>- African Impact Challenge page</li> <li>- Courses</li> <li>- Modules</li> </ul>	<p><b>Notifications:</b></p> <p>Parent class: none</p> <p>Subclasses: none</p> <p>Responsibilities :</p> <ul style="list-style-type: none"> <li>- Provide updates in the form of notifications on the “mail” icon for any new direct messages to the user.</li> <li>- Provide updates in the form of notifications on the “bell” icon for any new likes on posts, comments, replies, and comments and replies on the user’s post.</li> </ul> <p><b>Collaborations:</b></p> <ul style="list-style-type: none"> <li>- Login</li> <li>- Direct Messaging users</li> </ul>	

	<ul style="list-style-type: none"> <li>- Forum</li> <li>- Post</li> <li>- Comment</li> <li>- Reply</li> </ul>	
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## Back-End CRC Cards

<p><b>User</b>  Parent class: none  Subclasses: none  Responsibilities:</p> <ul style="list-style-type: none"> <li>- Save all user information including email, username, password, role and so on</li> <li>- Have abstract user information where built-in password verification can be used</li> <li>- Have the ability to chat, register and login</li> <li>- Able to authenticate if user is logged in or not</li> </ul> <p>Collaborations:</p> <ul style="list-style-type: none"> <li>- Sign up</li> <li>- Sign up for Partner Profiles</li> <li>- Login</li> </ul>	<p><b>Login:</b>  Parent class: none  Subclasses: none  Responsibilities:</p> <ul style="list-style-type: none"> <li>- Authenticates users who have registered themselves to access the application</li> <li>- Display an error message if authentication fails</li> <li>- The user can browse and access the application so long as they are not logged out or the session has timed-out.</li> <li>- Allows the user to reset their password</li> <li>- Provides a link to users who sign-up if they haven't registered themselves before.</li> </ul> <p>Collaborations:</p> <ul style="list-style-type: none"> <li>- Users</li> </ul>	<p><b>Sign up:</b>  Parent class: none  Subclasses: Sign up for Partner Profile  Responsibilities:</p> <ul style="list-style-type: none"> <li>- Require user to fill the mandatory fields for registering: <ul style="list-style-type: none"> <li>- Full Name</li> <li>- Email Address</li> <li>- Password</li> </ul> </li> <li>- User need to follow some rules while making a new password <ul style="list-style-type: none"> <li>- Not similar with personal information</li> <li>- Passwords should be at least 8 characters.</li> <li>- Password can't be entirely numeric</li> <li>- Display a Welcome message after signing up.</li> </ul> </li> </ul> <p>Collaborations:</p> <ul style="list-style-type: none"> <li>- Users</li> </ul>
<p><b>Sign up for Partner Profile:</b>  Parent class: Sign up</p>	<p><b>Direct Messaging Users:</b>  Parent class: none</p>	<p><b>Course-User:</b>  Parent class: none</p>

<p>Subclasses: none</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> <li>- Prompting user to enter the role as a user <ul style="list-style-type: none"> <li>- Student</li> <li>- Instructor</li> <li>- Partner</li> </ul> </li> <li>- The database will store information about the role of the user, so as to extract it in future.</li> </ul> <p>Collaborations:</p> <ul style="list-style-type: none"> <li>- Users</li> </ul>	<p>Subclasses: none</p> <p>Responsibilities :</p> <ul style="list-style-type: none"> <li>- Provide DIRECT text messaging capabilities to users so that they can communicate with each other.</li> <li>- Users can search for other users with whom they want to chat with.</li> <li>- Messages will be stored even after the user logs out.</li> </ul> <p>Collaborations:</p> <ul style="list-style-type: none"> <li>- Users</li> </ul>	<p>Subclasses: none</p> <p>Responsibilities :</p> <ul style="list-style-type: none"> <li>- Create the relationship between courses and users</li> <li>- Students/Instructors are able to view a list of courses enrolled.</li> <li>- Students/Instructors have the option to view assignment stuff.</li> </ul> <p>Collaborations:</p> <ul style="list-style-type: none"> <li>- Users</li> <li>- Courses</li> </ul>
<p><b>Module-Course:</b></p> <p>Parent class: none</p> <p>Subclasses: none</p> <p>Responsibilities :</p> <ul style="list-style-type: none"> <li>- Create the relationship between courses and module</li> <li>- Students are able to view a list of modules uploaded.</li> <li>- Instructors have the option to view module and upload it.</li> </ul> <p>Collaborations:</p> <ul style="list-style-type: none"> <li>- Module</li> <li>- Courses</li> </ul>	<p><b>Module-Course-User:</b></p> <p>Parent class: none</p> <p>Subclasses: none</p> <p>Responsibilities :</p> <ul style="list-style-type: none"> <li>- Create the relationship between courses and users and modules</li> <li>- Instructors are able to view a list of modules submitted.</li> <li>- Students have the option to view module and upload it.</li> </ul> <p>Collaborations:</p> <ul style="list-style-type: none"> <li>- Users</li> <li>- Courses</li> <li>- Module</li> </ul>	



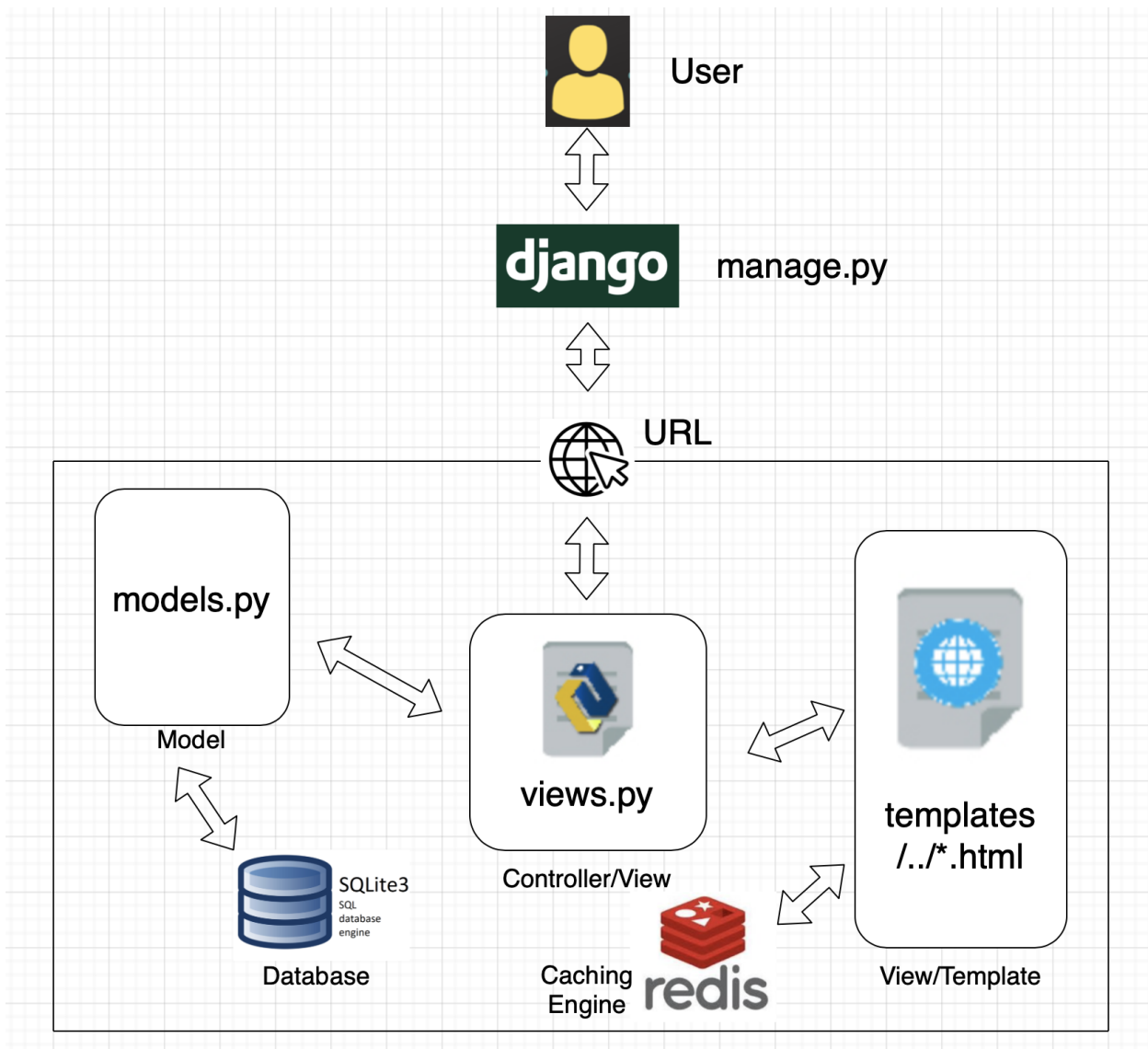
## Description of System Interaction with Environment

The user must have a working browser with internet access on any technological device. Through the browser, the user is able to access the site and can login or sign up using a valid email and password. Upon logging in or signing up successfully, the user can browse and access the application so long as they are not logged out or the session has timed-out. Specific users such as instructors are able to upload course content in the e-learning section as well as view and moderate the posts in the community section. Every user will have a profile where their profile name, and other basic info can be added or changed at will. If the user is uploading any data from their device (i.e for profile pictures or uploading documents), access to their system file storage will be required.

To run the web application locally, the steps are as follow: clone the Git repo to your device and then navigate to the project-growth folder and run `sh firstTimeRun.sh` and then cd to Growth and run `python manage.py runserver` to start the web app. This django deployment takes care of both the front and back end. The sh script takes care of the django installation as well as the virtualenv installation and activation. The default port by which the app can be accessed is 127.0.0.1:8000.

## Description of Architecture of the System

The software architecture model being used is the MVC model because of the dominant use of Django for the construction and coding of the system. MVC reflects the various components of the Django framework. System Decomposition explains the relationship better below. The software architecture diagram below details the interaction of varying components in the system.



## System Decomposition

Through the Django framework, the user can begin interacting with the web app using `manage.py` and the run instructions described above. After the local host server is up and running, all of the work is handled through Django's URL with the help of `views.py` as the Controller, various HTML templates as the View, and `models.py` as the Model, with the help of SQLite3 for keeping track of the Database. Redis is also used as a Caching Engine for live chat features.

There are several error prevention schemas in place, and a few are described in further detail: Errors during login and registration where common passwords are prevented from being used, as well as checking for valid email and password during each process. Username is also cross checked with the database to avoid creating duplicate usernames. Error prevention in forums is also done by preventing edits of other people's comments or posts.