A
Mini Project Report
on

SOCIAL MEDIA WEBSITE FOR ARTISANS

Submitted for partial fulfilment of the requirements for the award of the degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

By

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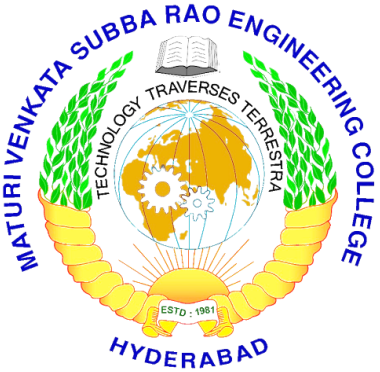

MATURI VENKATA SUBBA RAO (MVSR) ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(Affiliated to Osmania University & Recognized by AICTE)
Nadergul(V), Balapur(M), Ranga Reddy(D), Hyderabad – 501 510, Telangana, INDIA

(Academic Year: 2020 - 2021)

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CERTIFICATE

*This is to certify that the mini project work entitled "**SOCIAL MEDIA WEBSITE FOR ARTISANS**" is a bonafide work carried out by **Ashwath Thadishetty (2451-18-733-010)**, **Akula Rithika (2451-18-733-025)**, **Santhosh Kumar Repala (2451-18-733-039)** in partial fulfillment of the requirements for the award of degree of Bachelor of Engineering in Computer Science and Engineering from Maturi Venkata Subba Rao (MVSR) Engineering College, affiliated to OSMANIA UNIVERSITY, Hyderabad during the Academic Year 2020-21 under our guidance and supervision.*

The results embodied in this report have not been submitted to any other university or institute for the award of any degree or diploma.

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MVSREC

DECLARATION

This is to certify that the work reported in the present project entitled "**Social Media Website for Artisans**" is a record of bonafide work done by us / me in the Department of Computer Science and Engineering, Maturi Venkata Subba Rao (MVSR) Engineering College, Osmania University. The reports are based on the project work done entirely by us and not copied from any other source.

The results embodied in this project report have not been submitted to any other University or Institute for the award of any degree or diploma to the best of our / my knowledge and belief.

Signature of Student	Signature of Student	Signature of Student
Akula Rithika	**Ashwath Thadishetty**	**Santhosh Kumar Repala**
[2451-18-733-025]	[2451-18-733-010]	[2451-18-733-039]

ACKNOWLEDGEMENT

We would like to express my sincere gratitude and indebtedness to my project coordinator / guide T.Sujanavan sir for his/her valuable suggestions and interest throughout the course of this project.

We are also thankful to our principal Dr. G.Kanaka Durga ma'am and J. Prasanna Kumar sir, Head, Department of Computer Science and Engineering, Maturi Venkata Subba Rao (MVSR) Engineering College, Hyderabad for providing supporting infrastructure, environment and ambiance for completing this project successfully as a part of our B.E.(CSE) Degree.

We convey our heartfelt thanks to the lab staff for allowing us/me to use the required equipment whenever needed.

Finally, We would like to take this opportunity to thank my family for their support through the work. We sincerely acknowledge and thank all those who directly or indirectly supported us in completion of this work.

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

VISION

- To impart technical education of the highest standards, producing competent and confident engineers with an ability to use computer science knowledge to solve societal problems.

MISSION

- To make the learning process exciting, stimulating and interesting.
- To impart adequate fundamental knowledge and soft skills to students.
- To expose students to advanced computer technologies in order to excel in engineering practices by bringing out the creativity in students.
- To develop economically feasible and socially acceptable software.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

The Program Educational Objectives of the undergraduate program in Computer Science & Engineering are to prepare graduates who will:

1. Apply fundamentals obtained during the programme to successfully execute industry related software projects as a team member, leader or entrepreneur to meet customer business objectives.
2. Engage into life-long learning by pursuing professional certifications,higher education or research in the emerging areas of information processing and intelligent systems.
3. Understand the impact of computing on society, environment and make technical contributions through ethical practices.

(A) PROGRAM OUTCOMES(POs)

At the end of the program the students (Engineering Graduates) will be able to:

1. **Engineering knowledge:** Apply knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work,as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Lifelong learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

(B) PROGRAM SPECIFIC OUTCOMES (PSOs)

13. **(PSO-1)** Demonstrate competence to build effective solutions for computational real-world problems using software and hardware across multi-disciplinary domains.
14. **(PSO-2)** Adapt to current computing trends for meeting the industrial and societal needs through a holistic professional development leading to pioneering careers or entrepreneurship

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COURSE OBJECTIVES AND OUTCOMES

Course Objectives

- ➢ To enhance practical and professional skills.
- ➢ To familiarize tools and techniques of systematic literature survey and documentation
- ➢ To expose the students to industry practices and team work.
- ➢ To encourage students to work with innovative and entrepreneurial ideas

Course Outcomes

Student will be able to:-

1. Demonstrate the ability to synthesize and apply the knowledge and skills acquired in the academic program to the real-world problems.
2. Evaluate different solutions based on economic and technical feasibility.
3. Effectively plan a project and confidently perform all aspects of project management.
4. Demonstrate effective written and oral communication skills.
5. Demonstrate skills necessary for working in a team.

ABSTRACT

Artisans are the backbone of the non-farm rural economy, engaged in craft production to earn a livelihood. However, propelled by loss of markets, declining skills, and difficulty catering to new marketspaces, the number of Indian artisans has been rapidly decreasing. *"India's handicrafts exports nosedive 40%; artisans turn daily wagers to make ends meet."* quoted a stades article dated October 26, 2020. This dip calls for re-investment in artisans to safeguard history, culture, and an essential income resource. With prominent global firms like Amazon looking to collaborate with regional artisans, and startups like Meesho aiding small businesses to build their brands, a social website to share and promote their work is the need of the hour.

CollabArt is a Social Media Platform built using the Django framework. Its target audience are the artisans with inadequate or limited resources. The ability to showcase their commodities to the world is a dream every artist aspires to achieve. CollabArt turns this aspiration into actuality, with its content being open to all. The home page has a blog-style layout with posts ordered from the most recent to the least. Anybody with the website URL, a web browser, and Internet connectivity can access it. A registered user can create/update/delete their posts, and like, and comment on other's posts. The capability to post would enable these users to utilize the website as a marketplace. A user can register to the site, create their profile, and begin posting right away. Supporting these artisans has been made easier through the Buy or Donate page. This option would let the general audience submit a request and connect to the site's administrator who would establish communication between the buyer/donor and the artist. Currently, the website has a small database, but CollabArt intends to cater to the needs of a larger audience and add features like messaging and payments soon.

LIST OF FIGURES

LIST OF TABLES

LIST OF SYMBOLS, ABBREVIATIONS AND ACRONYMS

API	**Application programming interface**
AWS	**Amazon Web Services**
CSS	**Cascading Style Sheets**
DDL	**Data Definition Language**
DML	**Data Manipulation Language**
GUI	**Graphic User Interface**
HTML5	**Hypertext Markup Language 5**
IAM	**Identity and Access Management**
PaaS	**Platform as a Service**
PC	**Personal Computer**
OS	**Operating System**
S3	**Simple Storage Service**
SDK	**Software Development Kit**
SQL	**Structured Query Language**
UML	**Unified Modelling Language**
URL	**Uniform Resource Locator**
repo	**repository**

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1. INTRODUCTION

1.1 Problem Statement

Artisans of the nation have inadequate and limited resources. Issues like restricted market space, lower bids, and lack of means to expand their business reach across physical borders are the principal causes for artisans quitting their skill. *"India's handicrafts exports nosedive 40%; artisans turn daily wagers to make ends meet."* quoted a stades article dated October 26, 2020.

This decline calls for a medium that can connect the general public to the workers, can be easily used, and is platform-independent. Create a social platform for artisans where they can share their art and can connect to the general public through it.

1.2 Objectives

The website, named CollabArt, intends to achieve the following objectives:

- Free and open to use for all, i.e., no registration should be required for a general user to view the website's content.
- Allow interested users to register to the site for free.
- Provide basic social-media features to registered users.
- Provide an interface for general users to buy from or donate to interested artists or artworks.
- Scale the website to operate on a large number of users.

1.3 Scope

The website will be used as a social media platform for artisans to post their product's images and make them visible to people around the world through the Internet. The website intends to produce the following features as deliverables to its users:

- A platform-independent website available at the URL - https://collabartsite.herokuapp.com

1.3.1 Features

- General user features:
    - View all posts by all users or one particular user at a time
    - Send a Buy or Donate request
    - Register to site using the 'Sign Up' page
- Registered user features:
    - Log in/Logout
    - create/update/delete posts
    - like/comment
    - Edit personal details
    - Reset password through email verification

1.3.2 Out of Scope

Features that are beyond the scope of the project are:

- Send/Accept/Decline friend requests
- Chat interface
- Payment gateway for sales or donations
- Large-scale implementation

2. TECHNOLOGY REVIEW

The website is built using Django, a Python-based free and open-source web framework that follows the model-template-views architectural pattern.

2.1 Frontend

2.1.1 HTML5, CSS

HTML5 is a markup language used for structuring and presenting content on the World Wide Web. CSS is a style sheet language used for describing the presentation of a document that is written in a markup language.

2.1.2 Bootstrap

Bootstrap is a free and open-source CSS framework directed at responsive, mobile-first front-end web development. It contains CSS and JavaScript-based design templates for typography, forms, buttons, navigation, and other interface components. Some custom CSS styling is defined explicitly for the website.

2.1.3 Canva

The website's logo was created using Canva, a graphic design platform used to create social media graphics, presentations, posters, documents, and other visual content.

2.2 Backend

2.2.1 Django

"Django admin" is an auto-generated backend interface that allows website management for several simple use cases efficiently.

Django has high security, preventing threats like SQL injection, cross-site scripting, cross-site request forgery, and clickjacking. Its user authentication system provides a secure way to manage user accounts and passwords.

2.2.2 SQLite

Database creation, updation, deletion are integrated into Python through an SQLite database.

2.3 Python packages

Package name	**Version**
asgiref	3.3.1
boto3	1.17.22
botocore	1.20.22
dj-database-url	0.5.0
Django	3.1.7
django-crispy-forms	1.11.1
django-heroku	0.3.1
django-storages	1.11.1
gunicorn	20.0.4
jmespath	0.10.0
Pillow	8.1.2
psycopg2	2.8.6
python-dateutil	2.8.1
pytz	2021.1
s3transfer	0.3.4
six	1.15.0
sqlparse	0.4.1
urllib3	1.26.3
whitenoise	5.2.0

Table 2.3.1: Python packages and versions

2.4 Storage

2.4.1 AWS S3

Amazon S3 is a service offered by Amazon Web Services that provides object storage through a web service interface. It replicates data across servers and data centers within a selected region to achieve high availability. An AWS account and a bucket containing all user posts and profile images were created with the capability to add, update and delete them by an authorized user.

2.4.2 AWS IAM

AWS Identity and Access Management (IAM) enables us to manage access to AWS services and resources securely. Using IAM, AWS users and groups can be created and managed and also use permissions to allow and deny their access to AWS resources.

2.4.3 S3Boto3Storage

The supported backend for interacting with Amazon's S3, through Django is S3Boto3Storage, based on the boto3 library. It creates, configures, and manages the AWS S3 services. The SDK provides an object-oriented API and also low-level access to AWS services.

2.5 Deployment

2.5.1 Heroku

Heroku is a PaaS based on a managed container system, with integrated data services and a robust ecosystem, for deploying and running modern apps.
Website URL: https://collabartsite.herokuapp.com

2.5.2 PostgreSQL

PostgreSQL is a free and open-source relational database management system emphasizing extensibility and SQL compliance. The site's database was moved to PostgreSQL for better compatibility with Heroku.

2.6 Version Control

Git

Git is a software for tracking changes in any set of files, usually used for coordinating work among programmers collaboratively developing source code during development.

3. SYSTEM REQUIREMENTS

Device	Desktop, PC, Mobile Phone		
Memory	2 GB minimum		
Screen resolution	1280x1024 or larger (desktop/PC), 360x640 or larger (mobile)		
Internet connection	Required		
URL	https://collabartsite.herokuapp.com		
Other	Browser supports JavaScript and style sheets		
	Windows Requirements	**Mac Requirements**	**Linux Requirements**
Operating system	Windows 8 or later	macOS Sierra 10.12 or later	64-bit Ubuntu 14.04+, Debian 8+, openSUSE 13.3+, or Fedora Linux 24+
Processor	Intel Pentium 4 or later	Intel	Intel Pentium 4 or later
Web Browser	Google Chrome(latest), Microsoft Edge(latest), Firefox(latest), Internet Explorer 9 or higher	Safari(latest), iPhone Safari	Google Chrome(latest), Microsoft Edge(latest), Firefox(latest), Internet Explorer 9 or higher

Table 3.1: System Requirements

Any user with a device that meets the above recommended requirements and the valid URL to the website can access the site. These users automatically become ‘General users’ or ‘visitors’ or ‘general public’ of the website, and shall be referred to by these names in this document.

4. SYSTEM DESIGN

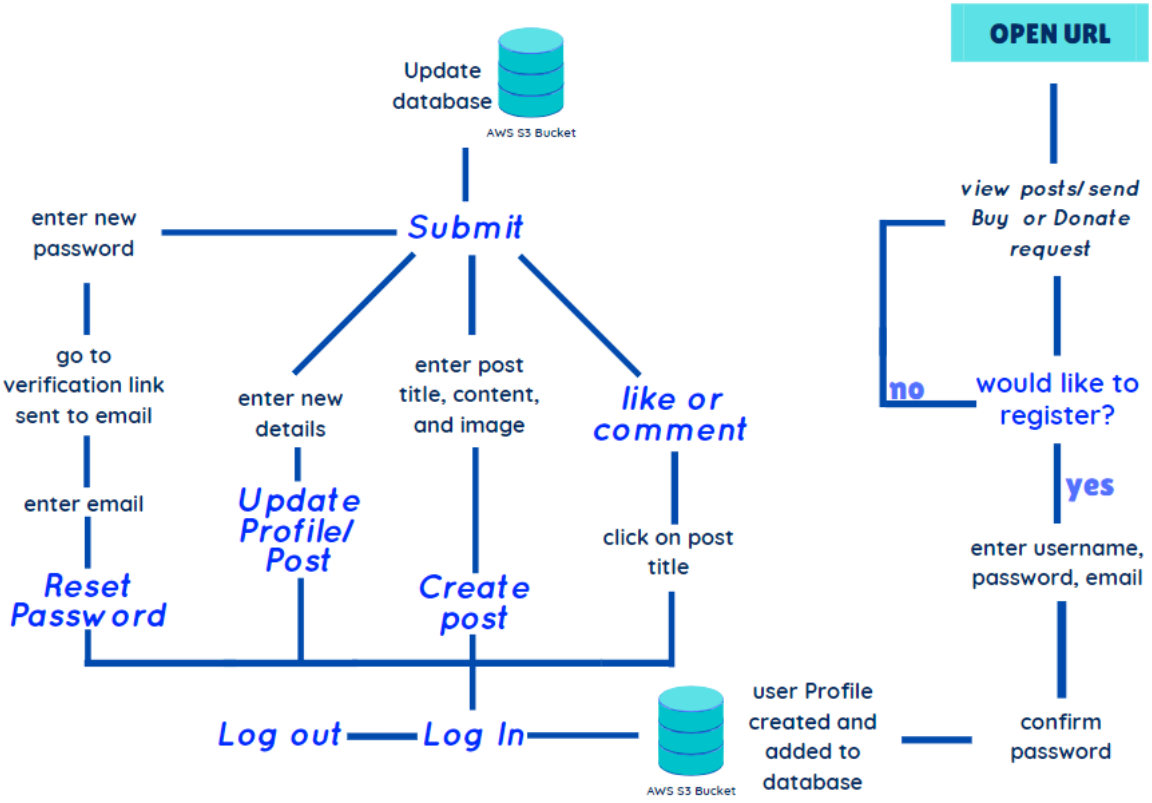


Figure 4: Basic System Design

The System Design can be understood through the UML diagrams drawn. All functionalities, classes, methods and sequences are depicted in different forms through these diagrams. Software used to draw diagrams: Umbrello.

4.1 Use Case Diagram

Figure 4.1: Use case diagram

4.2 Class Diagram

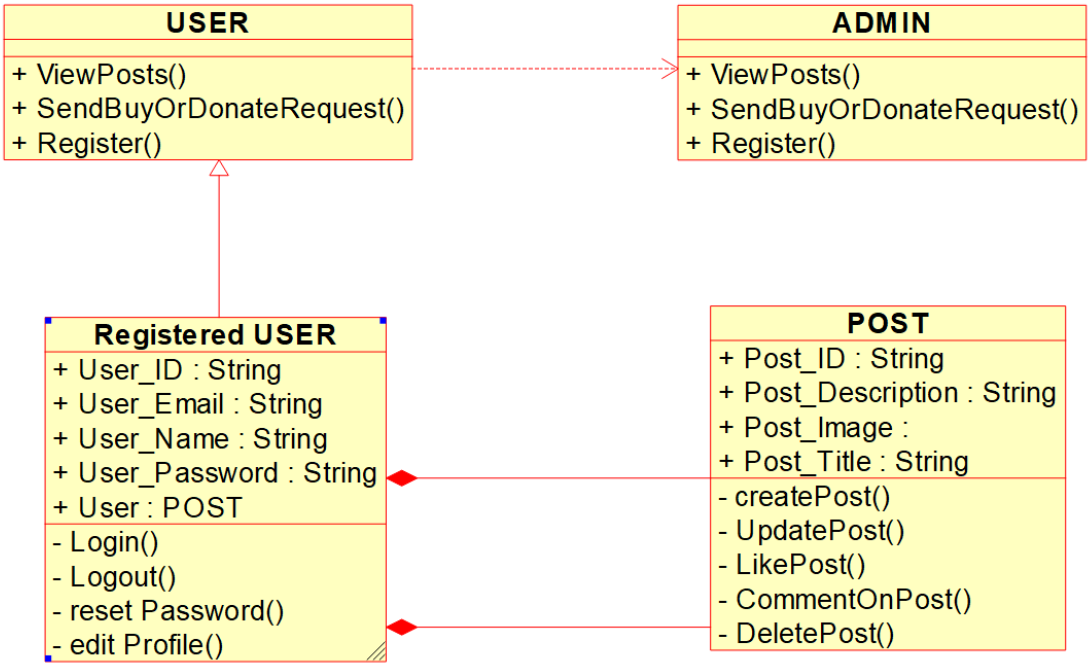


Figure 4.2: Class diagram

4.3 Activity Diagrams

4.3.1 For Login Page

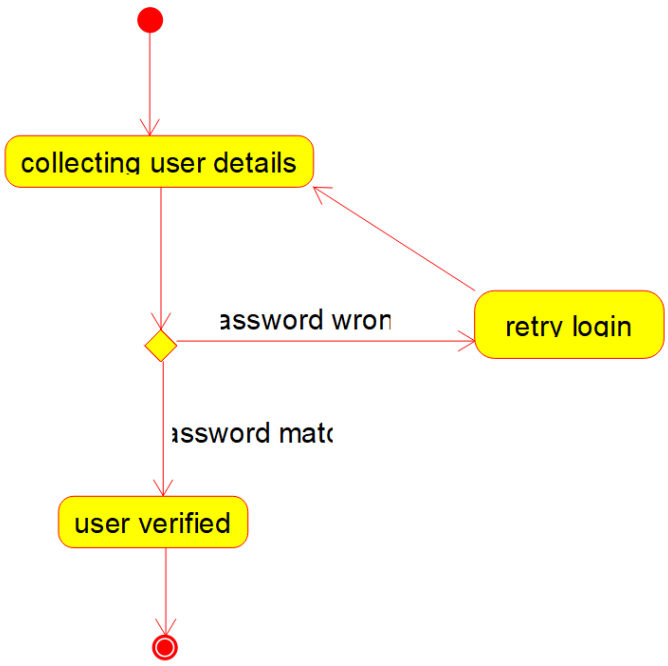


Figure 4.3.1: Activity Diagram For Login Page

4.3.2 For Register Page

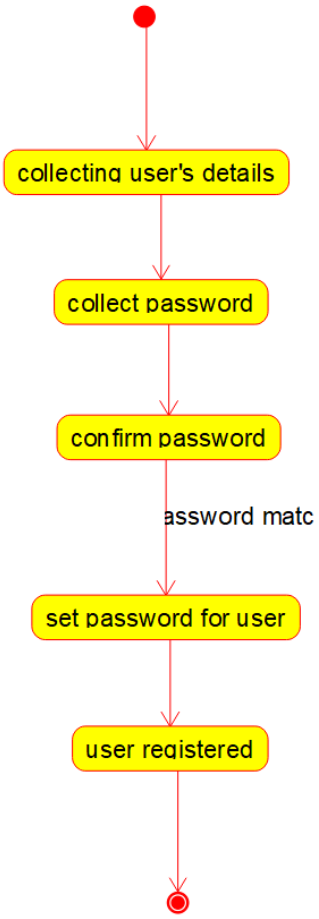


Figure 4.3.2: Activity Diagram For Register Page

4.4 Sequence Diagram for Admin user

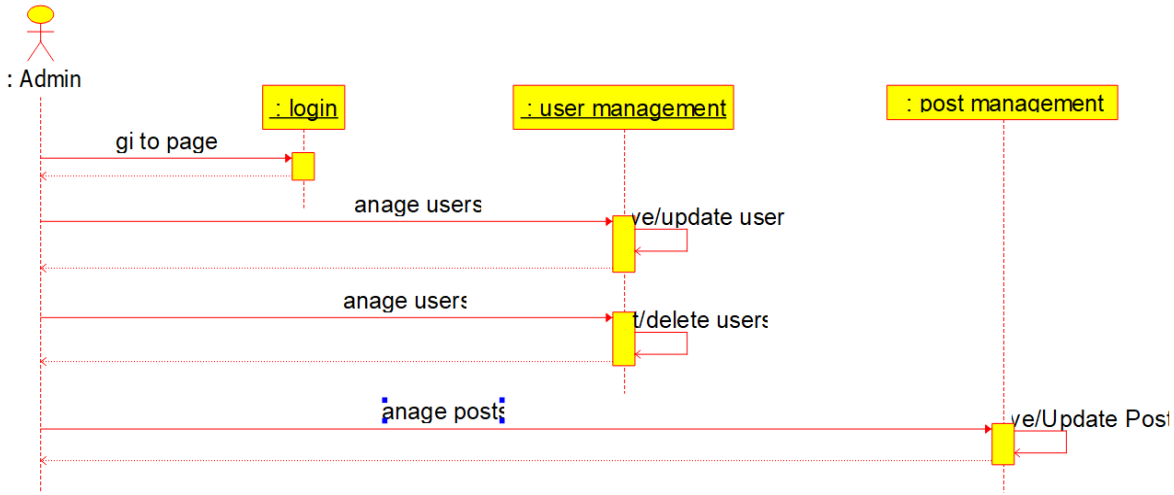


Figure 4.4: Sequence Diagram for Admin user

4.5 State Diagrams

4.5.1 For Post Class

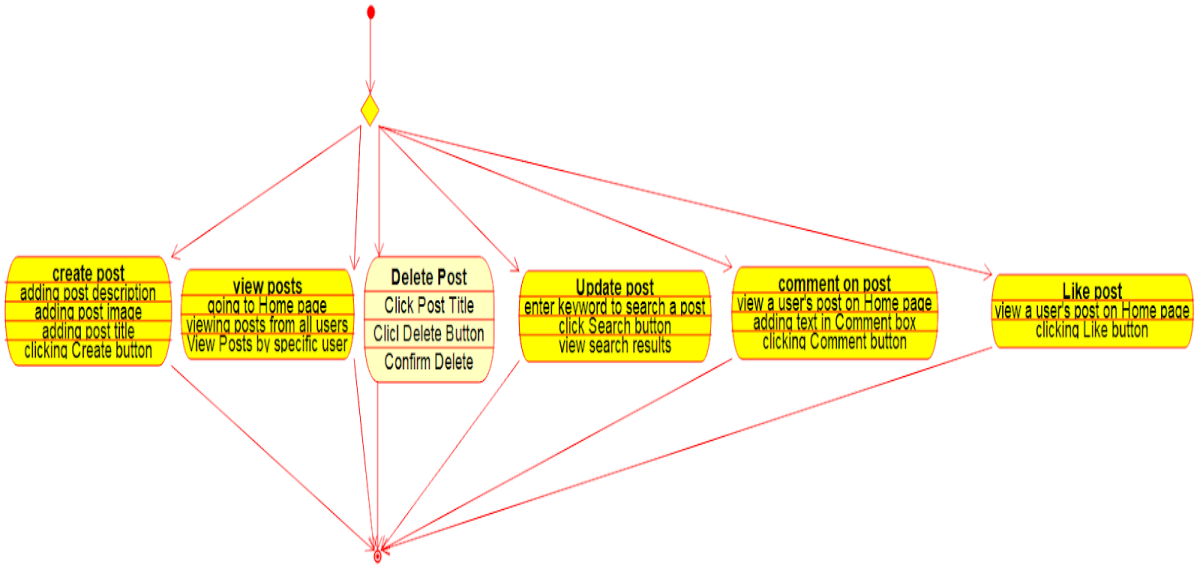


Figure 4.5.1: State diagram for Post class

4.5.2 For User Class

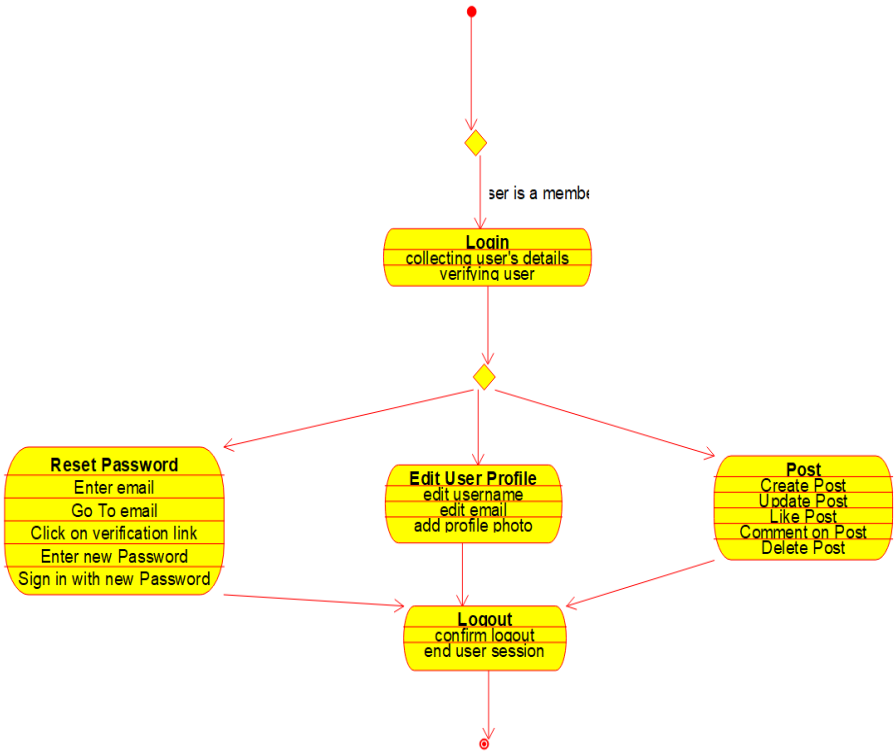


Figure 4.5.2: State diagram for User class

4.5.3 For Admin Class

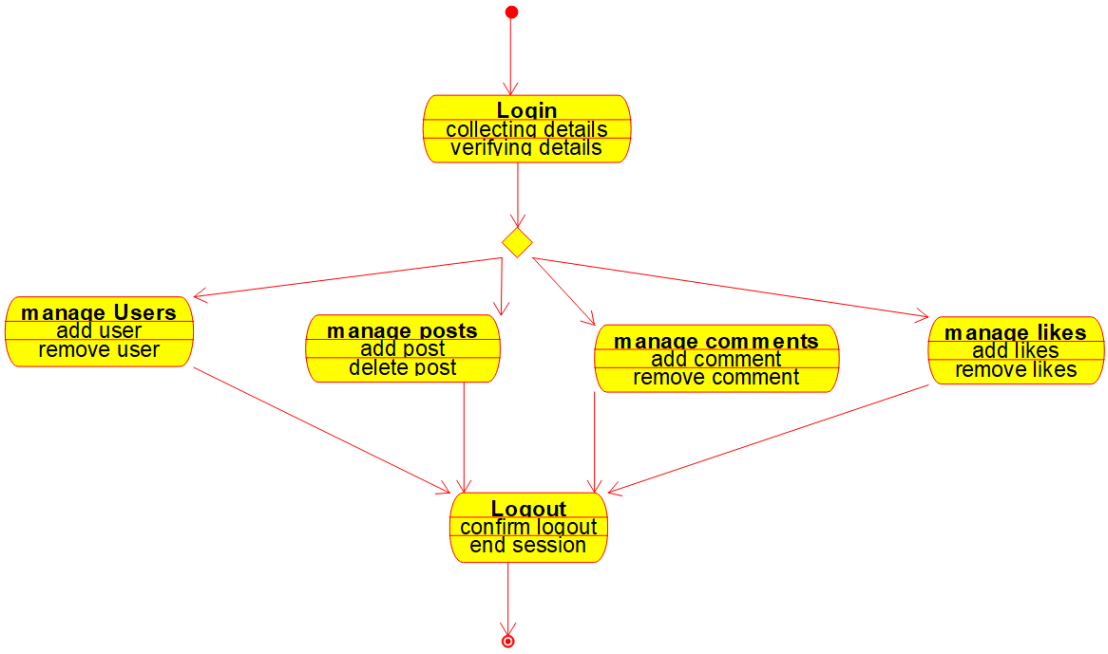


Figure 4.5.3: State Diagram For Admin Class

4.6 Component Diagram

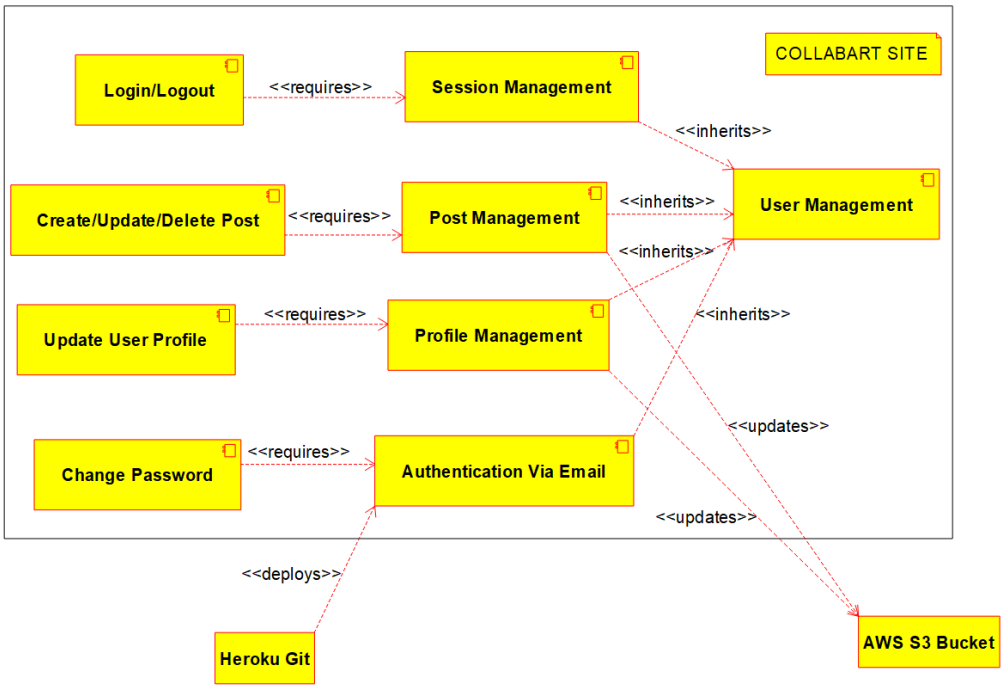


Figure 4.6: Component Diagram

4.7 Deployment Diagram

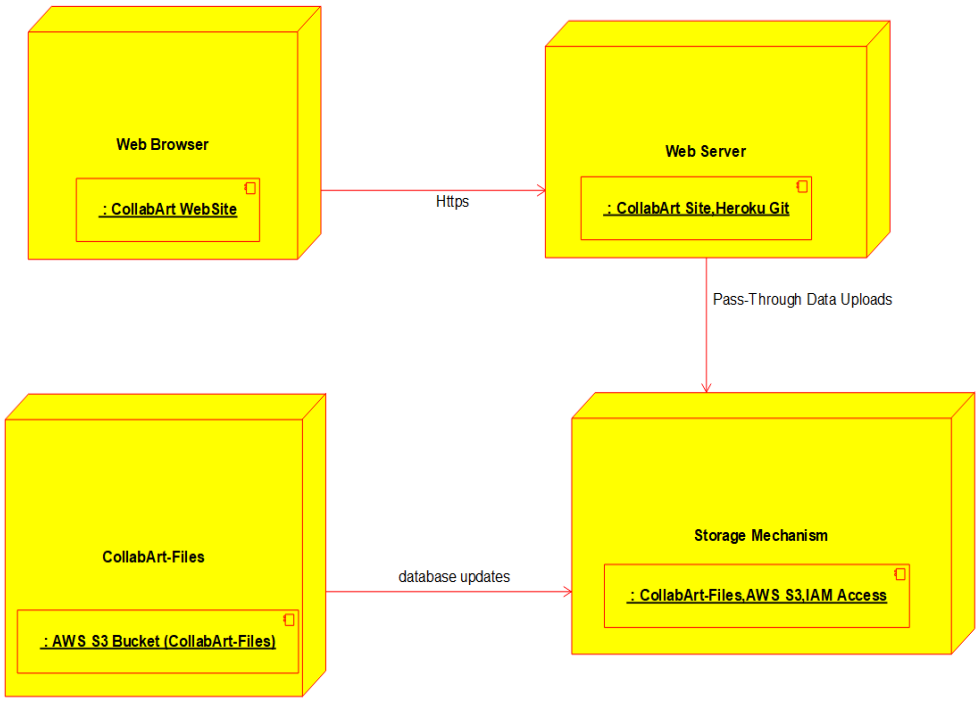


Figure 4.7: Deployment Diagram

5. IMPLEMENTATION

5.1 Django Framework

There are many Web Development tools and technologies available, and of them, Django was chosen for the implementation of this website. The following features are exclusive to Django and aid in simpler and faster web development:

- URL routing
- Free API
- Easy Database Migrations
- New capabilities can be plugged-in using applications
- Default Admin section
- Easy-to-understand Documentation and Tutorials
- Scalable
- High Security

5.2 Planning

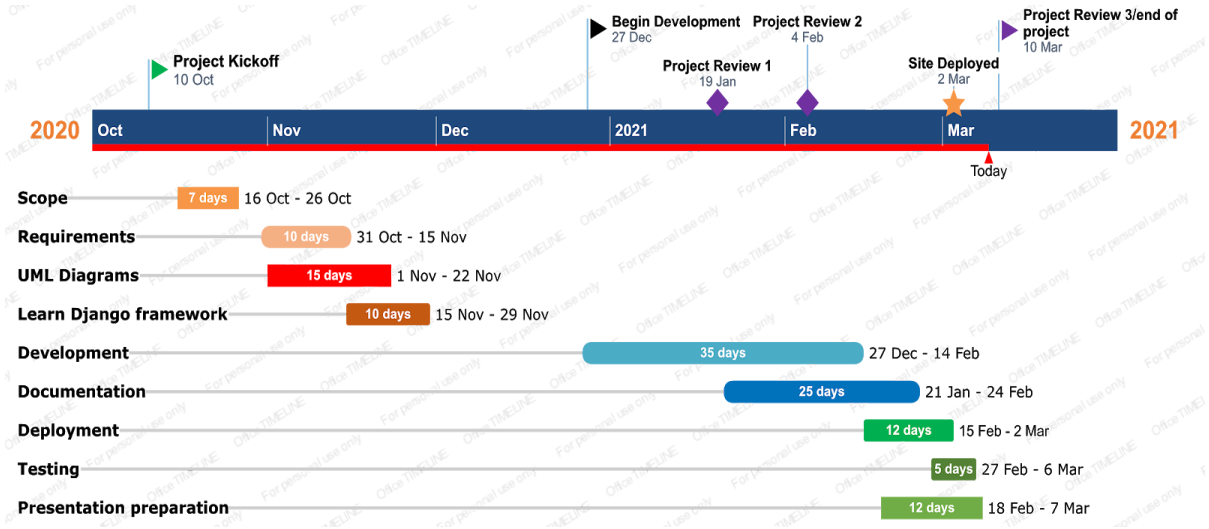
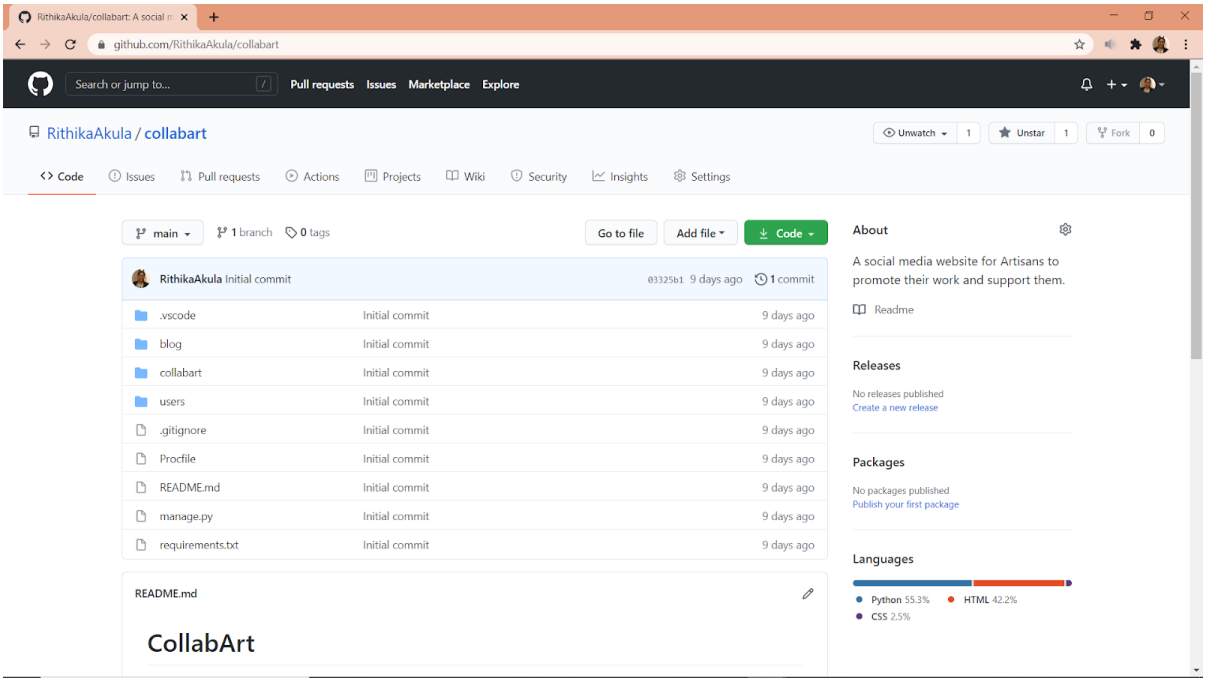


Fig. 5.2 Development Timeline

5.3 Collaboration

GitHub is used as a collaboration and version control tool in this project. The teammates were added as collaborators to the public GitHub repository. The repo was branched every time a new feature was added by a teammate, pull requests were made, and upon approval from all, were merged with the main branch.

Github public repository URL: https://github.com/RithikaAkula/collabart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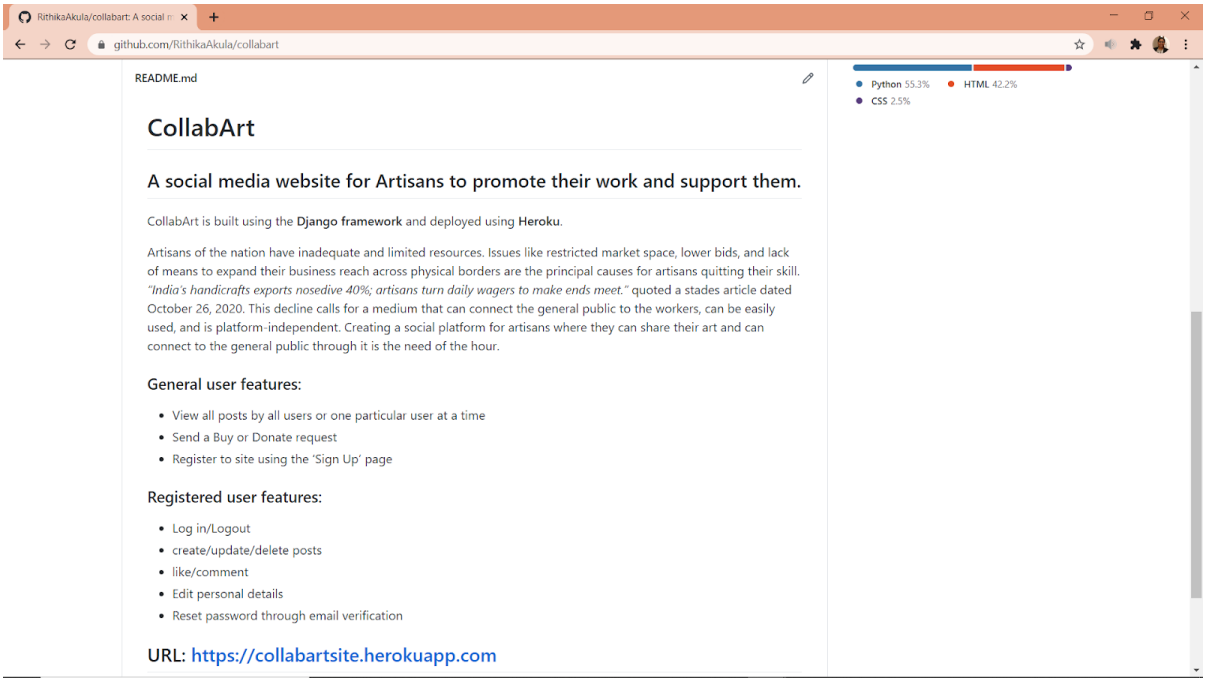
github.com/RithikaAkula/collabart
Search or jump to...
Pull requests
Issues
Marketplace
Explore
RithikaAkula / collabart
Unwatch 1
Unstar 1
Fork 0
Code
Issues
Pull requests
Actions
Projects
Wiki
Security
Insights
Settings
main
1 branch
0 tags
Go to file
Add file
Code
RithikaAkula Initial commit
03325b1 9 days ago
1 commit
.vscode Initial commit 9 days ago
blog Initial commit 9 days ago
collabart Initial commit 9 days ago
users Initial commit 9 days ago
.gitignore Initial commit 9 days ago
Procfile Initial commit 9 days ago
README.md Initial commit 9 days ago
manage.py Initial commit 9 days ago
requirements.txt Initial commit 9 days ago
About
A social media website for Artisans to promote their work and support them.
Readme
Releases
No releases published
Create a new release
Packages
No packages published
Publish your first package
Languages
Python 55.3%
HTML 42.2%
CSS 2.5%
README.md
CollabArt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README.md
Python 55.3%
HTML 42.2%
CSS 2.5%
CollabArt
A social media website for Artisans to promote their work and support them.
CollabArt is built using the Django framework and deployed using Heroku.
Artisans of the nation have inadequate and limited resources. Issues like restricted market space, lower bids, and lack of means to expand their business reach across physical borders are the principal causes for artisans quitting their skill. "India's handicrafts exports nosedive 40%; artisans turn daily wagers to make ends meet." quoted a stades article dated October 26, 2020. This decline calls for a medium that can connect the general public to the workers, can be easily used, and is platform-independent. Creating a social platform for artisans where they can share their art and can connect to the general public through it is the need of the hour.
General user features:
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Registered user features:
Log in/Logout
create/update/delete posts
like/comment
Edit personal details
Reset password through email verification
URL: https://collabartsite.herokuapp.com

5.4 Python packages and database connectivity

The below graph has been plotted using graphviz.

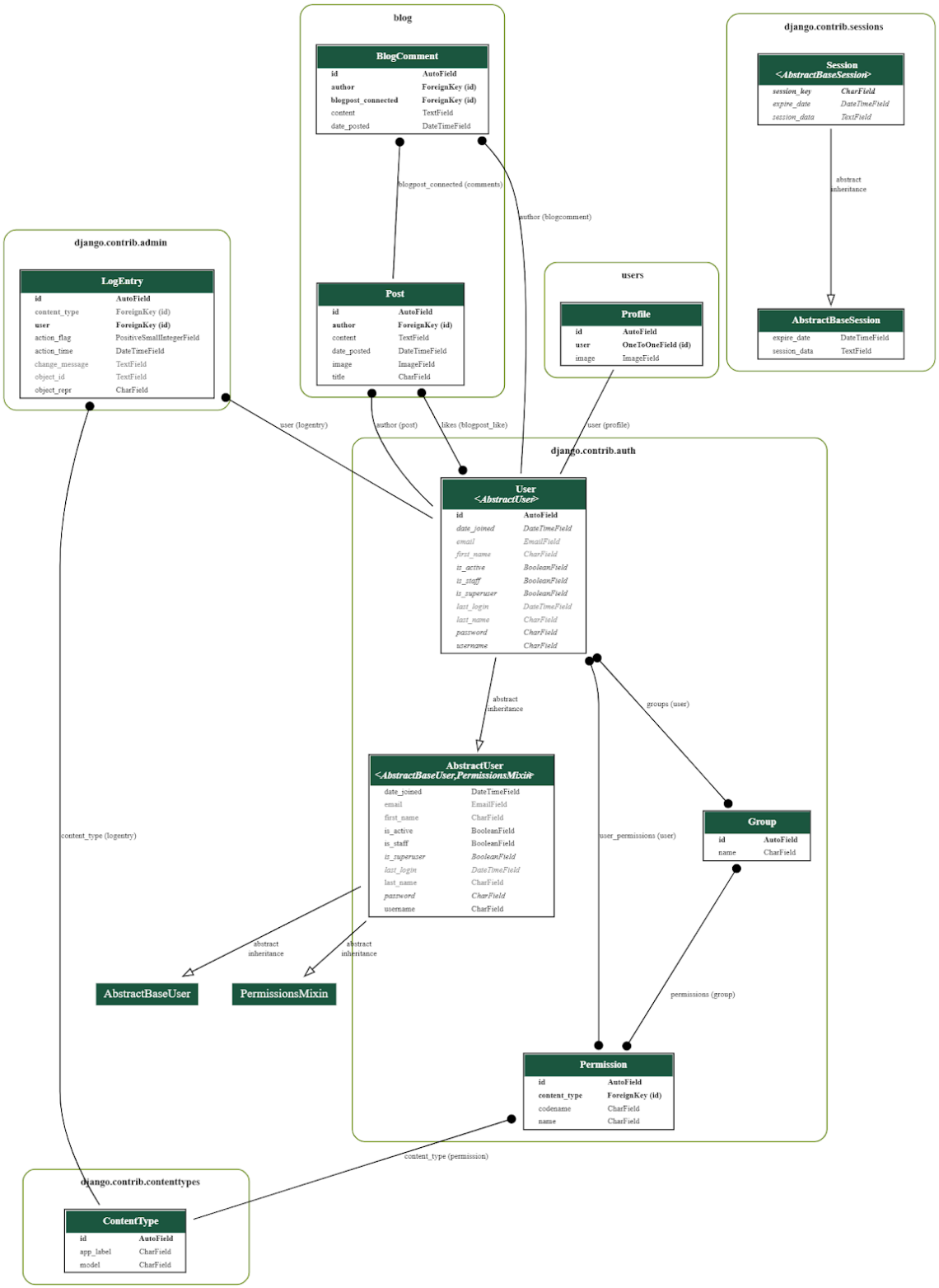
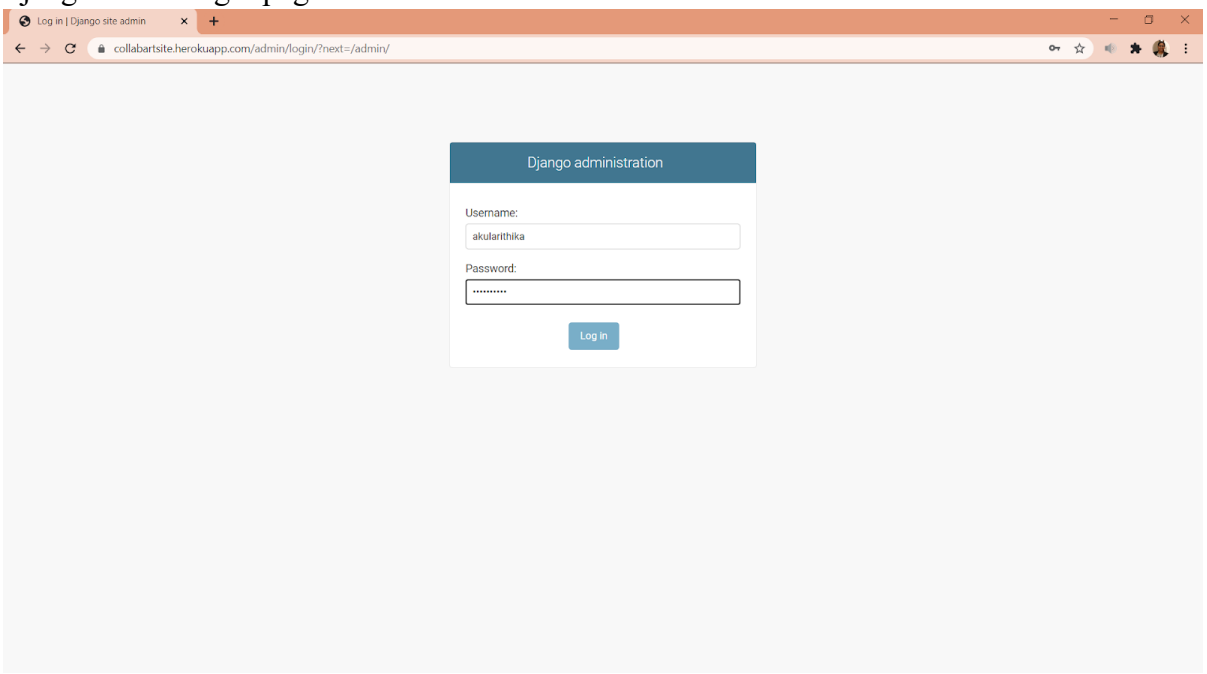
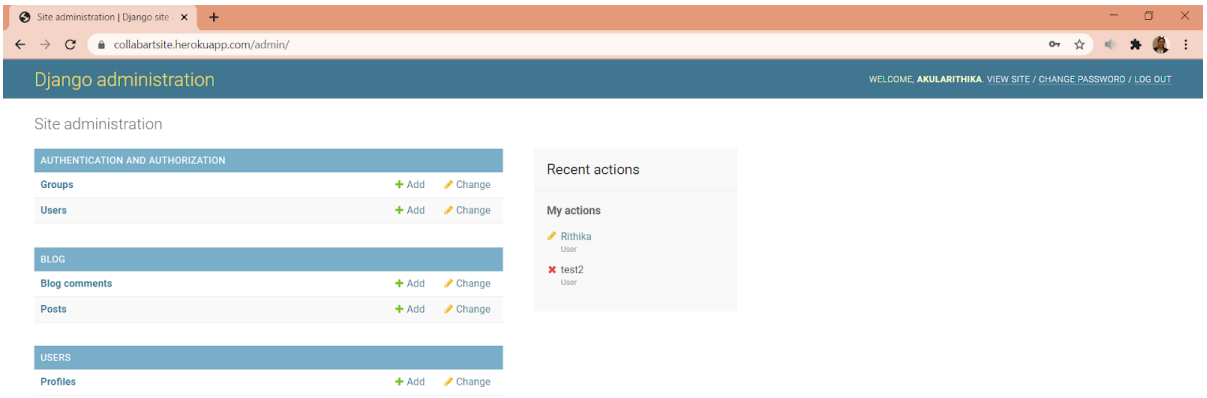


Figure 5.4: packages and database connectivity

All Django websites come with an in-built admin interface and a GUI to update the database in a simple manner without having to type the DML or DDL commands.

Django admin login page:



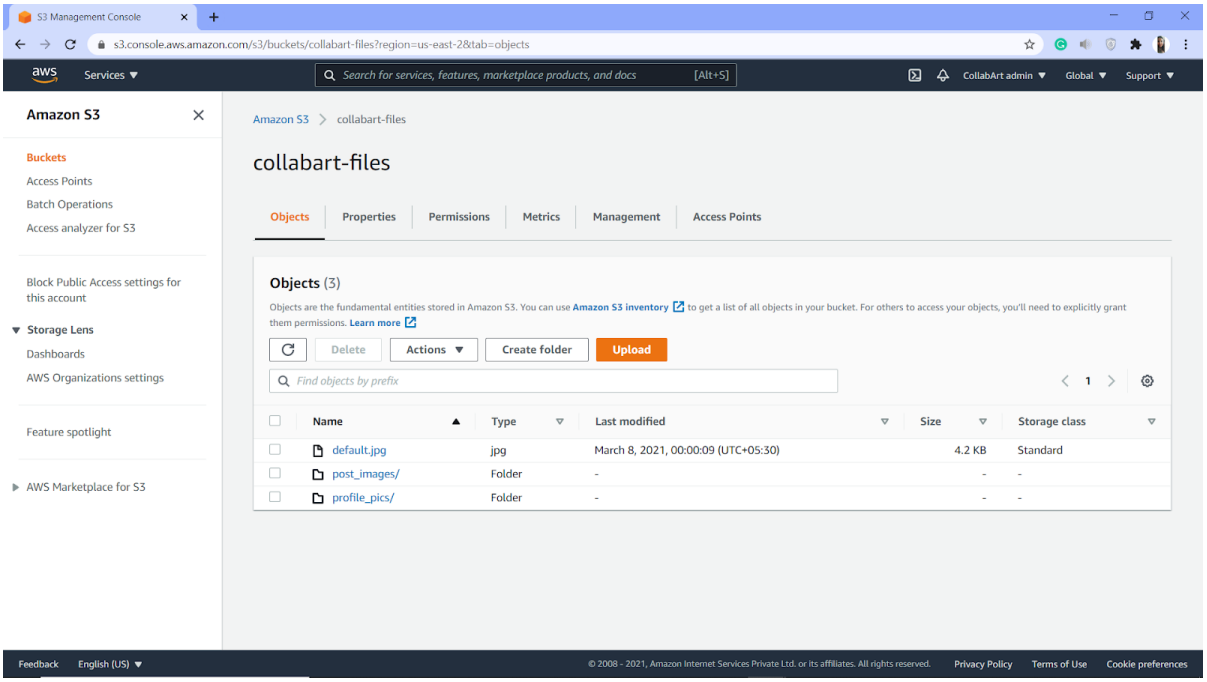


As seen above, the Django admin can access all views and models created in the website. The Authentication and Authorization models are in built in every Django application

5.5 Cloud storage

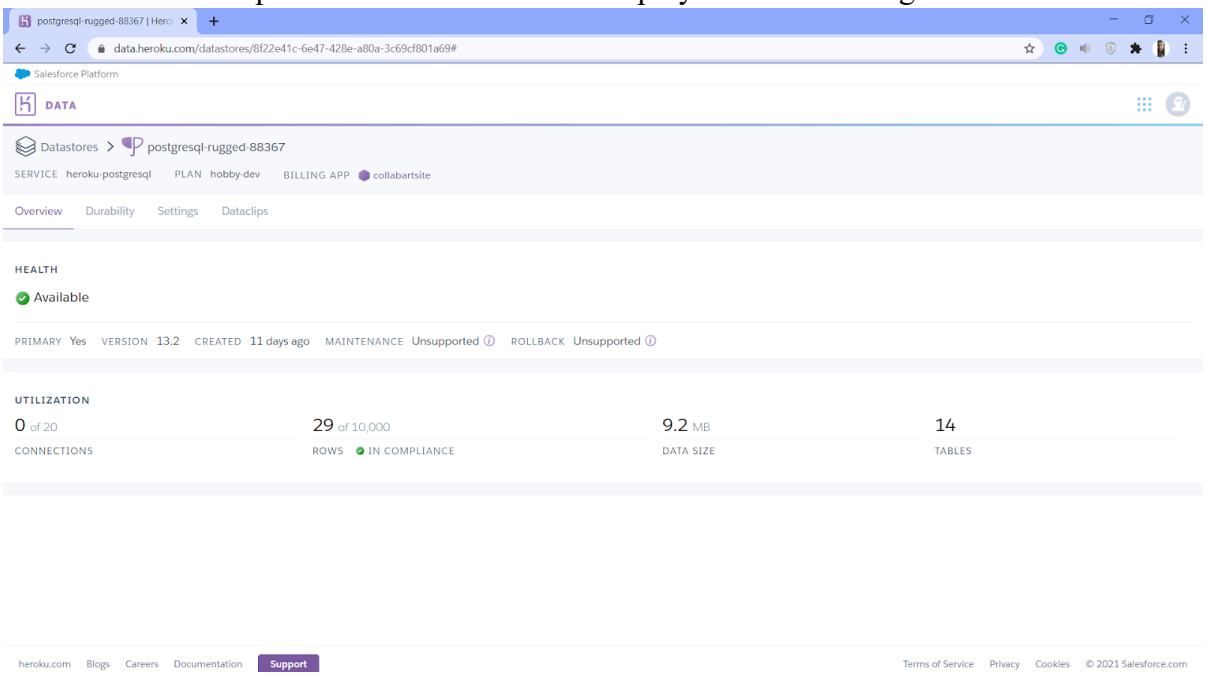
5.5.1 AWS S3 bucket

An AWS free-tier account was created. The S3 Storage feature available was set up and along with integration with IAM, we could use the S3 service for cloud storage of all files created, updated or deleted at the CollabArt site.



5.5.2 Heroku

The free tier subscription to Heroku is used for deployment and hosting.



Heroku has the PostgreSQL add-on to support Data storage and access. The admin of the app can access the database from the command prompt opened in the local repo of the site.

The list of tables are:

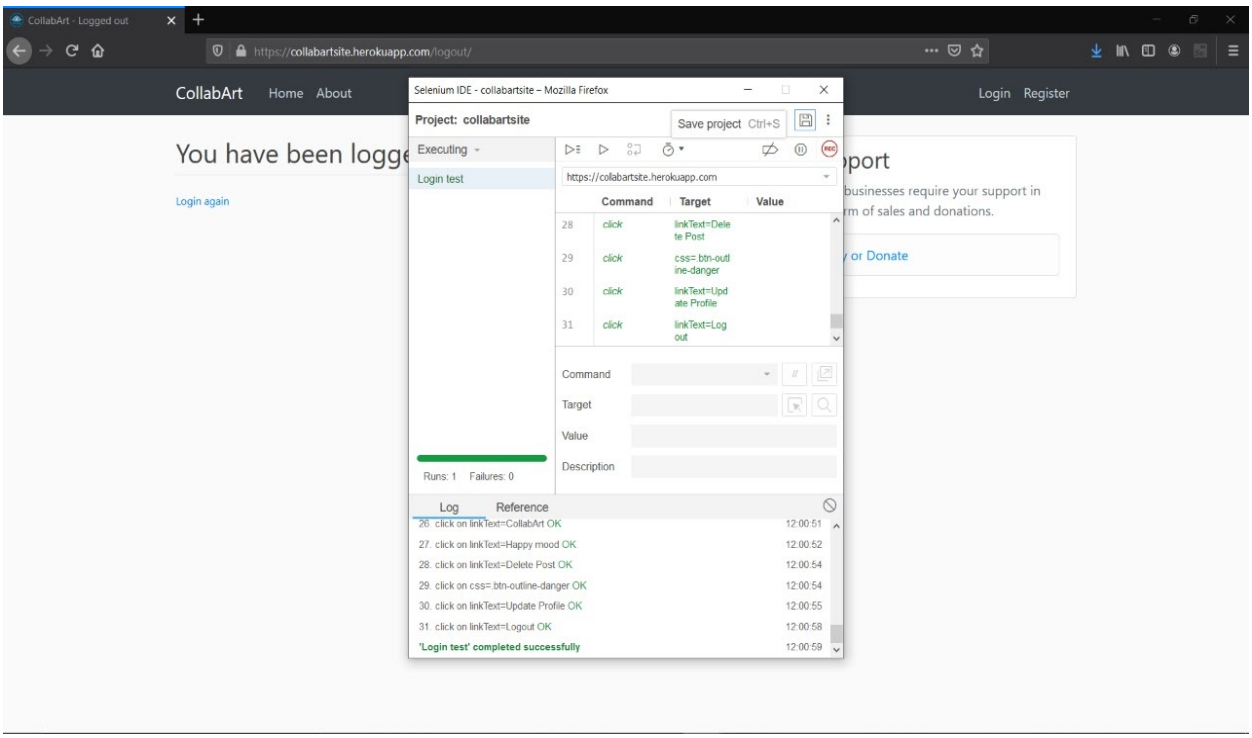
```
collabartsite::DATABASE=> # \dt
                    List of relations
 Schema |            Name            | Type  |     Owner
--------+----------------------------+-------+----------------
 public | auth_group                 | table | kmqocijhhgsoyk
 public | auth_group_permissions     | table | kmqocijhhgsoyk
 public | auth_permission            | table | kmqocijhhgsoyk
 public | auth_user                  | table | kmqocijhhgsoyk
 public | auth_user_groups           | table | kmqocijhhgsoyk
 public | auth_user_user_permissions | table | kmqocijhhgsoyk
 public | blog_blogcomment           | table | kmqocijhhgsoyk
 public | blog_post                  | table | kmqocijhhgsoyk
 public | blog_post_likes            | table | kmqocijhhgsoyk
 public | django_admin_log           | table | kmqocijhhgsoyk
 public | django_content_type        | table | kmqocijhhgsoyk
 public | django_migrations          | table | kmqocijhhgsoyk
 public | django_session             | table | kmqocijhhgsoyk
 public | users_profile              | table | kmqocijhhgsoyk
(14 rows)
```

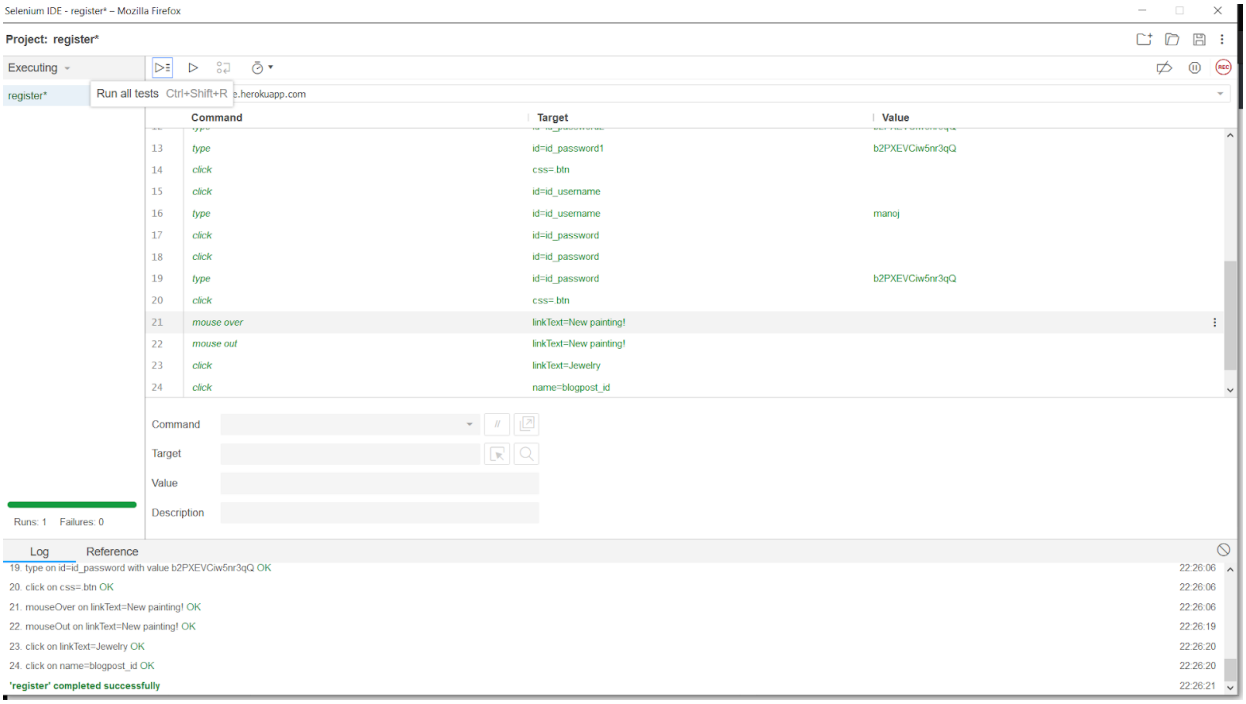
The database can be accessed using basic DDL and DML commands.

```
collabartsite::DATABASE=> select * from blog_post;
 id |        title        |                                        content                                                                        |         date_posted          | author_id |
               image
----+---------------------+-----------------------------------------------------------------------------------------------------------------------+-------------------------------+-----------+
--------------------------------------
  1 | Handloom            | Handloom Cloth making\r                                                                                              +| 2021-03-08 02:27:33.951959+00 |         2 |
post_images/threads_Br4n6Gq.jpg
    |                     | Made using traditional techniques and hand-dyed thread                                                                |                               |           |
  2 | Tribal Jewelry      | traditional tribal jewelry made with locally-sourced beads, stones, and crystals                                      | 2021-03-08 02:29:44.73576+00  |         2 |
post_images/jewellery_UCoFb2S.jpg
  3 | Pot Painting        | Pots sculpted and painted using organic colors.\r                                                                    +| 2021-03-08 02:57:20.547242+00 |         1 |
post_images/pot_UBl0aTO.jpg
    |                     | Ready for sale.\r                                                                                                    +|                               |           |
    |                     | 50 Rs./piece\r                                                                                                       +|                               |           |
    |                     | Submit a Buy or Donate request and put post_title in the message to buy this product                                  |                               |           |
  5 | Tribal Art Warli    | The themes choosen are from the nature.Harvesting is one of the major theme.Paintings are mainly created on mud walls of tribal houses. | 2021-03-08 03:49:29.252477+00 |         3 |
post_images/Tribal-Folk-Art-Warli.jpg
  4 | Newly made dolls    | traditional dolls made of wood                                                                                        | 2021-03-08 03:43:59+00        |         4 |
post_images/doll_PelkuC8.jpg
  7 | dolls               | for sale                                                                                                              | 2021-03-08 15:25:32.801914+00 |         1 |
post_images/dolls.jpg
  6 | COLOURFUL           | Traditional painting done by using organic paints on canvas \r                                                       +| 2021-03-08 15:00:13.687868+00 |         5 |
post_images/painting2.jpg
    |                     | Enjoyed a lot \r                                                                                                     +|                               |           |
    |                     | Rs. 150                                                                                                               |                               |           |
 10 | Traditional Handloom | Blue fabric hand-loomed for use in bedsheets, cushion covers, etc.\r                                                +| 2021-03-10 04:34:25.979535+00 |         9 |
post_images/handloom.jpg
    |                     | Submit a request to the right to customize your order.                                                                |                               |           |
 11 | Cloth painting      | the cloth is hand-painted                                                                                             | 2021-03-12 18:56:47.208871+00 |        14 |
post_images/images.jpg
 12 | Jewelry             | Necklace up for sale!\r                                                                                              +| 2021-03-12 19:41:44.080542+00 |        12 |
post_images/jewelry.jpg
    |                     | Send a Buy or Donate request from the link on the right to personalize and buy it.                                    |                               |           |
 13 | New painting!       | Made on hand-made paper\r                                                                                            +| 2021-03-12 19:44:53.509763+00 |         5 |
post_images/paint.jpg
    |                     | Depicts a tribal scene                                                                                                |                               |           |
(11 rows)
```

6. TESTING

The site has been tested using the Selenium software.
A few test cases are shown below:





7. CONCLUSION

The website currently has the following restrictions:

- Limited data storage
  Limited number of users with less access time
- No advertising of the website itself

As the website is not scaled for commercial use, it has not yet reached its actual end-users, the artisans.

We would also like to implement the following features

- Send/Accept/Decline friend requests
- Chat interface
- Payment gateway for sales or donations

With the website being commercially deployed and with the above proposed features, we hope that our website aids in growth of the country's artisans and promotes this major and diverse sector's work across the limitations of physical borders through the Internet.

8. REFERENCES

The following websites were referred to in the course of learning of the technologies, development and deployment of the project:

- https://docs.djangoproject.com/en/3.1/
- https://www.youtube.com/watch?v=UmljXZIypDc&list=PL-osiE80TeTtoQCKZ03TU5fNfx2UY6U4p
- https://django-storages.readthedocs.io/en/latest/backends/amazon-S3.html
- https://devcenter.heroku.com/articles/deploying-python

The stades article referred to in the Abstract:

- https://30stades.com/2020/10/26/covid-19-indias-handicrafts-exports-nosedive-40-percent-artisans-turn-daily-wagers-to-make-ends-meet/

9. APPENDIX

Complete Source Code available at the GitHub repository:
https://github.com/RithikaAkula/collabart