

**Course title: MCS7013\_ Collaborative Research Project-1 for Computer Science (MCS 7013)**

**Project Title:** Social Networking Site

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**SOCIAL NETWORKING SITE**

**Abstract**

Social networking platforms have fundamentally transformed how individuals connect, share ideas, and build communities. However, existing platforms often grapple with issues such as data privacy breaches, limited user autonomy, and challenges in creating personalized user experiences. This project aims to develop a **Social Networking Site** utilizing the Django framework for its scalable backend and SQLite3 as the database for streamlined data management.

The proposed platform emphasizes security, user control, and community engagement by integrating core features such as user authentication, profile management, multimedia content sharing, real-time notifications, and private messaging. Additionally, users can create and participate in groups and forums, fostering meaningful interactions and collaboration. Privacy controls empower users to manage their content visibility, ensuring transparency and trust.

The project employs modern web development practices to ensure the site is responsive and mobile-compatible, catering to diverse user demographics. By leveraging Django’s robust architecture and SQLite3's lightweight yet efficient database, the platform ensures seamless functionality, scalability, and data integrity. This initiative provides an innovative solution to the challenges of contemporary social networking while focusing on user-centric design and secure interactions.

**CHAPTER - I**

**INTRODUCTION**

**1. Background**

Social networking has become an integral part of modern life, reshaping how people connect, communicate, and collaborate. Platforms like Facebook, Instagram, and LinkedIn have facilitated global connectivity, enabling individuals to share ideas, create communities, and foster professional relationships. However, despite their widespread popularity, these platforms face significant challenges, including privacy concerns, data security issues, and a lack of user control over shared content.

Users often encounter difficulties managing their online presence due to complex privacy settings and overwhelming content, leading to a suboptimal social networking experience. Furthermore, the centralized architecture of many popular platforms increases the risk of data breaches and unauthorized access, compromising user trust.

This project seeks to address these challenges by developing a secure and user-friendly **Social Networking Site** using Django and SQLite3. Django, a high-level Python web framework, offers robust tools for creating scalable web applications, while SQLite3 provides an efficient and lightweight database solution, ideal for managing user data and interactions.

The proposed platform emphasizes user-centric features such as secure authentication, content sharing with customizable visibility options, real-time messaging, and community-building tools like groups and forums. By focusing on privacy, security, and user autonomy, this project aims to deliver a modern and inclusive social networking solution that empowers individuals and communities to connect meaningfully while maintaining control over their online interactions.

**2. Significance of the problem**

The proposed **Social Networking Site** addresses critical challenges faced by users in the current digital landscape, offering innovative solutions to enhance user experience, data privacy, and community engagement. The significance of the project is highlighted through its ability to:

1. **Enhance Privacy and Data Security**

Unlike many existing platforms that expose user data to potential breaches, this project prioritizes user privacy by employing secure authentication methods and robust data management practices. By leveraging Django’s in-built security features and SQLite3's reliable storage capabilities, the platform ensures safe user interactions and minimizes risks of unauthorized access.

1. **Empower User Autonomy**

Users are given full control over their shared content and interactions. Customizable privacy settings allow them to manage visibility, ensuring transparency and trust. This emphasis on user empowerment fosters a positive and secure online environment.

1. **Promote Meaningful Connections**

By incorporating features like real-time messaging, group creation, and forums, the platform enables users to build and maintain meaningful personal and professional relationships. These community-focused tools foster collaboration and engagement, making the platform suitable for diverse audiences.

1. **Address Accessibility and Usability**

The platform is designed to be mobile-compatible and user-friendly, ensuring accessibility across various devices. The intuitive interface and responsive design make it easy for users from different demographics to navigate and interact with the site seamlessly.

1. **Adapt to Modern Web Needs**

The project's scalability and modular design allow it to grow with user demands. This adaptability ensures the platform remains relevant in the fast-evolving world of social networking.

By focusing on security, user control, and community-driven features, this project serves as a reliable alternative to existing social networking platforms, addressing pressing concerns and redefining how people interact and share in the digital age.

**3. Objective of the project**

The primary objective of the **Social Networking Site** project is to create a secure, scalable, and user-friendly platform that empowers individuals and communities to connect, share, and collaborate effectively. The project aims to achieve the following key goals:

1. **Develop a Secure and Scalable Platform**
   * Utilize Django’s robust framework to ensure a reliable backend infrastructure.
   * Implement secure authentication mechanisms to safeguard user data and accounts.
   * Leverage SQLite3 for efficient data management and easy scalability.
2. **Enable Rich User Interactions**
   * Provide features like user registration, profile creation, and customizable profile settings.
   * Allow users to share multimedia content (text, images, and videos) with control over visibility settings.
   * Facilitate real-time interactions through private messaging and notifications.
3. **Foster Community Engagement**
   * Offer tools for group creation and management to enable collaboration and community-building.
   * Introduce forums and discussion boards for meaningful conversations among users.
4. **Enhance User Experience**
   * Design a responsive and intuitive interface for seamless navigation across devices.
   * Ensure accessibility and usability to cater to a diverse user base.
5. **Prioritize Privacy and Control**
   * Implement advanced privacy controls for users to manage content visibility and interactions.
   * Ensure compliance with modern data protection standards to build trust and credibility.
6. **Create a Foundation for Future Expansion**
   * Employ a modular architecture to facilitate the addition of advanced features such as AI-driven content recommendations, analytics, and social graph insights in future iterations.

By fulfilling these objectives, the project aims to provide a modern, feature-rich social networking solution tailored to user needs, emphasizing privacy, security, and meaningful connections.

**4. Scope of the project**

The **Social Networking Site** project is designed to provide a versatile and user-centric platform that addresses the limitations of existing social networking solutions. Its scope extends across various dimensions, emphasizing utility, scalability, and adaptability for different user needs. Key areas of focus include:

**1. Personal Networking**

* Facilitates connections between friends and family through features such as profile creation, direct messaging, and multimedia sharing.
* Enhances communication with real-time notifications and updates.

**2. Professional Networking**

* Offers a platform for professionals to create profiles, share achievements, and build career connections.
* Supports community forums and groups for collaborative discussions on industry-specific topics.

**3. Community Building**

* Enables users to form interest-based groups and communities, fostering collaboration and shared purpose.
* Includes tools for discussion boards and event creation to organize community activities.

**4. Educational Use**

* Serves as a platform for educational institutions to create groups for students, faculty, and alumni.
* Facilitates knowledge sharing through forums and group discussions.

**5. Privacy and Security Focus**

* Empowers users with customizable privacy settings for content visibility and interaction control.
* Ensures secure handling of user data with Django's built-in security features and SQLite3's reliable storage.

**6. Scalability and Flexibility**

* Built with a modular architecture, the platform is adaptable for future enhancements like AI-based content recommendations, sentiment analysis, or e-commerce integrations.
* Designed to accommodate a growing user base while maintaining performance and security.

**7. Mobile Compatibility**

* Optimized for mobile devices to ensure accessibility across a broad spectrum of users.
* Provides a responsive design for seamless functionality on smartphones and tablets.

**8. Social Impact**

* Promotes digital inclusivity by offering a platform for users in underserved regions to connect and share.
* Encourages healthy online interactions by emphasizing user autonomy and community engagement.

**5. Relevance and Impact**

The development of this chatbot has the potential to address several pressing issues in modern healthcare:

1. **Accessibility**: By providing instant assistance, the chatbot ensures that individuals in underserved regions can receive medical guidance.
2. **Affordability**: The system reduces the cost of initial consultations by offering free or low-cost solutions for symptom analysis.
3. **Efficiency**: Automating the initial diagnostic process saves time for both users and healthcare professionals.
4. **Patient Empowerment**: By offering detailed information, the chatbot encourages users to make informed decisions about their health.

**Challenges and Limitations**

While the proposed system offers significant benefits, it also faces certain challenges:

1. **Accuracy and Reliability**: Ensuring high prediction accuracy is critical to avoid misguiding users. The system relies heavily on the quality of the training data.
2. **Ambiguity in User Input**: Users may input symptoms in vague or inconsistent terms, requiring robust preprocessing and natural language understanding.
3. **Ethical and Privacy Concerns**: Protecting user data and maintaining confidentiality is paramount in healthcare applications.
4. **Scope of Diseases**: The chatbot’s predictions are limited to the diseases included in its training dataset, which may exclude rare or emerging conditions.

**CHAPTER – II**

**LITERATURE SURVEY**

**1. Evolution of Social Networking Platforms**

Social networking platforms have evolved significantly since the advent of early systems like SixDegrees (1997) and Friendster (2002). These early platforms primarily focused on connecting users within their personal networks. Over time, platforms like Facebook, Twitter, and LinkedIn introduced features such as multimedia sharing, real-time messaging, and professional networking, fundamentally transforming how individuals interact online.

However, as these platforms scaled, they encountered challenges such as data breaches, algorithm-driven echo chambers, and user dissatisfaction with limited control over content. Research by Boyd and Ellison (2007) highlighted that while social networks enhance connectivity, they also pose risks to privacy and data security. These findings underscore the need for platforms that balance engagement with user control and security.

**2. Security and Privacy Concerns**

One of the critical issues in modern social networking is user data security. Studies by Acquisti et al. (2015) have shown that users often unknowingly compromise their privacy due to unclear data-sharing policies. High-profile incidents, such as the Facebook-Cambridge Analytica scandal, have amplified concerns over data misuse, highlighting the need for platforms that prioritize transparency and user control.

To address these concerns, Django offers built-in security mechanisms, including protection against SQL injection, cross-site scripting (XSS), and cross-site request forgery (CSRF). SQLite3 complements this by providing a secure and lightweight database solution, ensuring data integrity and safety.

**3. User Engagement and Community Building**

Research by Kraut et al. (2016) emphasizes the importance of fostering meaningful user engagement on social networking sites. Features such as interest-based groups, forums, and real-time communication tools enhance user satisfaction and loyalty. Platforms like Reddit and Discord demonstrate the effectiveness of community-focused models in building strong user bases.

This project integrates similar community-building tools, such as group creation, discussion boards, and event planning, enabling users to interact meaningfully. By emphasizing collaborative features, the platform aims to create a vibrant and engaged user community.

**4. Accessibility and Mobile Compatibility**

With the growing penetration of smartphones, mobile accessibility has become a critical requirement for social networking platforms. Statista (2023) reports that over 90% of social media users access platforms via mobile devices. Studies by Nielsen Norman Group (2020) stress the need for responsive and user-friendly designs to ensure accessibility across devices.

This project incorporates responsive design principles, ensuring seamless functionality on desktops, tablets, and smartphones. The emphasis on mobile compatibility enhances usability, catering to a broad and diverse audience.

**5. Current Gaps in Existing Solutions**

Despite advancements, existing platforms face limitations that this project seeks to address:

* Data Privacy: Many platforms lack robust privacy controls, leaving users vulnerable to data misuse. This project integrates customizable privacy settings to empower users.
* User Autonomy: Platforms often dictate content visibility through opaque algorithms. The proposed system prioritizes user-defined settings for greater transparency.
* Scalability and Modularity: Existing solutions frequently struggle with scaling features or integrating new technologies. This project employs a modular architecture, facilitating seamless upgrades and expansion.

**CHAPTER – III**

**SYSTEM ANALYSIS**

**Existing System**

Social networking platforms like Facebook, Instagram, and LinkedIn have dominated the digital landscape, offering users a range of features including profile creation, content sharing, messaging, and community building. These platforms primarily rely on centralized architectures, collecting and processing vast amounts of user data to power their features and algorithms.

While these systems have enabled global connectivity, they are not without limitations. Many platforms focus on maximizing user engagement through algorithms that prioritize content visibility, often at the expense of user privacy, autonomy, and meaningful interactions. Additionally, they are prone to scalability and security challenges, especially as their user base grows.

**Disadvantages:**

1. Limited Prediction Accuracy
2. Inability to Handle Ambiguity
3. Static Knowledge Base
4. Lack of Contextual Awareness
5. Privacy and Security Concerns
6. Dependence on Internet Connectivity
7. Not a Replacement for Medical Professionals

**Proposed System**

The **Social Networking Site** project aims to address the limitations of existing platforms by providing a secure, scalable, and user-centric solution tailored to modern networking needs. Built using the Django framework and SQLite3 database, the proposed system offers features that prioritize user privacy, autonomy, and community engagement while ensuring accessibility and scalability.

**Advantages**

1. Improved Prediction Accuracy with Deep Neural Networks
2. Personalized and Context-Aware Predictions
3. Scalability and Flexibility
4. Instant and Accessible Healthcare Support
5. Data Security and Privacy
6. Reduced Healthcare System Burden
7. User-Friendly and Intuitive Interface

**CHAPTER – IV**

**SYSTEM REQUIREMENTS**

**Hardware Requirements**

* Processor - Intel-Core I5
* RAM - 1 6 GB
* Hard Disk - 512 GB
* Key Board - Standard Windows Keyboard Backligth
* Mouse - Two or Three Button Mouse
* Monitor - Laptop

**Software Requirements**

* Operating system: Windows 11.
* Coding Language: Python.
* Front-End: Python.
* Back-End: Django-ORM
* Designing: Html, css, javascript.

**CHAPTER – V**

**IMPLEMENTATION**

The implementation of the **Social Networking Site** involves multiple stages, including setting up the development environment, creating the backend with Django, designing the frontend, implementing the database structure using SQLite3, and ensuring the integration of security and real-time features. This document provides a detailed overview of the implementation process.

**1. Setting Up the Development Environment**

The first step in the implementation is setting up the development environment, which includes installing necessary tools, frameworks, and libraries.

**1.1 Install Python and Dependencies**

Python 3.x is required for the Django framework. Install Python by visiting the official website and downloading the latest version (Python 3.8 or higher). After installing Python, use **pip**, the Python package manager, to install the required libraries:

bash

Copy code

pip install django

pip install sqlite3

**1.2 Install Django Framework**

Django is the chosen backend framework for the project. It is necessary to create a Django project and start a Django app for the site.

bash

Copy code

django-admin startproject social\_network

cd social\_network

python manage.py startapp users

This command creates the base structure of the project and the "users" app, which will handle user management.

**1.3 Set Up the Database (SQLite3)**

SQLite3 is chosen as the database for this project due to its simplicity and integration with Django. Django’s default settings use SQLite3 as the database engine, so no additional configuration is required for basic use.

In the settings.py file of the Django project, ensure that the default database configuration points to SQLite:

python

Copy code

DATABASES = {

'default': {

'ENGINE': 'django.db.backends.sqlite3',

'NAME': BASE\_DIR / 'db.sqlite3',

}

}

This configuration automatically creates an SQLite3 database file in the project directory.

**2. Backend Implementation (Django)**

**2.1 Create User Model**

The first step in backend development is creating the user model for the platform. The user model is essential for handling user authentication, profile data, and privacy settings. To implement the user model, add the following fields:

python

Copy code

from django.contrib.auth.models import AbstractUser

from django.db import models

class CustomUser(AbstractUser):

profile\_picture = models.ImageField(upload\_to='profiles/', null=True, blank=True)

bio = models.TextField(max\_length=500, blank=True)

is\_active = models.BooleanField(default=True)

Here, the CustomUser model extends the default AbstractUser model provided by Django, adding custom fields like a profile picture and bio.

**2.2 Implement User Registration and Authentication**

Django provides a built-in authentication system, which includes features for user login, logout, and password management. The registration system can be customized to handle additional user information.

For registration, create a form in the forms.py file:

python

Copy code

from django import forms

from .models import CustomUser

class CustomUserCreationForm(forms.ModelForm):

class Meta:

model = CustomUser

fields = ['username', 'email', 'password', 'profile\_picture', 'bio']

This form allows users to enter their username, email, password, profile picture, and bio when registering.

In the views.py file, define a view to handle registration:

python

Copy code

from django.shortcuts import render, redirect

from django.contrib.auth import login

from .forms import CustomUserCreationForm

def register(request):

if request.method == 'POST':

form = CustomUserCreationForm(request.POST, request.FILES)

if form.is\_valid():

user = form.save()

login(request, user)

return redirect('home')

else:

form = CustomUserCreationForm()

return render(request, 'register.html', {'form': form})

**2.3 Profile Management**

Users should be able to view and update their profiles. Create a profile view and a form to update profile details:

python

Copy code

def profile(request):

user = request.user

if request.method == 'POST':

form = CustomUserCreationForm(request.POST, request.FILES, instance=user)

if form.is\_valid():

form.save()

else:

form = CustomUserCreationForm(instance=user)

return render(request, 'profile.html', {'form': form})

This view allows users to update their profile picture, bio, and other personal details.

**3. Frontend Implementation**

**3.1 HTML Templates and Structure**

The frontend of the social networking site consists of HTML templates, which define how the site’s pages are displayed to users. The following sections describe some key templates.

**Register Template (register.html)**:

html

Copy code

<form method="post" enctype="multipart/form-data">

{% csrf\_token %}

{{ form.as\_p }}

<button type="submit">Register</button>

</form>

This template renders the registration form and ensures that users can submit their details securely with the CSRF token for protection.

**Profile Template (profile.html)**:

html

Copy code

<form method="post" enctype="multipart/form-data">

{% csrf\_token %}

{{ form.as\_p }}

<button type="submit">Update Profile</button>

</form>

This template allows users to update their profile information, including uploading a new profile picture.

**3.2 CSS and Styling**

Use CSS to ensure the frontend is responsive and visually appealing. The styling includes basic layout structure, colors, and fonts. You can use frameworks like Bootstrap or custom CSS to improve the design.

css

Copy code

body {

font-family: Arial, sans-serif;

background-color: #f4f4f4;

}

form {

margin: 20px;

padding: 15px;

background-color: white;

border-radius: 8px;

box-shadow: 0 2px 10px rgba(0, 0, 0, 0.1);

}

**3.3 JavaScript for Real-Time Interactions**

For real-time functionality like messaging and notifications, JavaScript can be used to make AJAX requests and update the UI dynamically. For example, use JavaScript to handle real-time notifications when a user receives a message.

javascript

Copy code

function fetchNotifications() {

fetch('/notifications/')

.then(response => response.json())

.then(data => {

const notificationList = document.getElementById('notifications');

notificationList.innerHTML = '';

data.notifications.forEach(notification => {

notificationList.innerHTML += `<li>${notification.message}</li>`;

});

});

}

**4. Database Implementation**

**4.1 Models and Database Schema**

The database is managed by SQLite3, and the project uses Django’s ORM (Object-Relational Mapping) to interact with the database. The following models define the necessary entities for the social networking site:

* **User Model**: Stores information like username, email, profile picture, and bio.
* **Post Model**: Represents posts shared by users, including text, images, and timestamps.
* **Comment Model**: Stores comments on posts.
* **Message Model**: Represents private messages exchanged between users.

python

Copy code

class Post(models.Model):

user = models.ForeignKey(CustomUser, on\_delete=models.CASCADE)

content = models.TextField()

image = models.ImageField(upload\_to='posts/', null=True, blank=True)

created\_at = models.DateTimeField(auto\_now\_add=True)

class Comment(models.Model):

post = models.ForeignKey(Post, on\_delete=models.CASCADE)

user = models.ForeignKey(CustomUser, on\_delete=models.CASCADE)

content = models.TextField()

created\_at = models.DateTimeField(auto\_now\_add=True)

**4.2 Migrations**

Once the models are created, run the following commands to create the database schema:

bash

Copy code

python manage.py makemigrations

python manage.py migrate

This will generate the necessary database tables for the application.

**5. Security Features**

**5.1 Django Security Best Practices**

Django includes various security features that help protect against common vulnerabilities:

* **SQL Injection Prevention**: The Django ORM ensures that SQL queries are automatically parameterized, preventing SQL injection attacks.
* **CSRF Protection**: Django provides built-in CSRF protection, ensuring that requests are secure.
* **Password Hashing**: User passwords are hashed before storage, preventing unauthorized access.

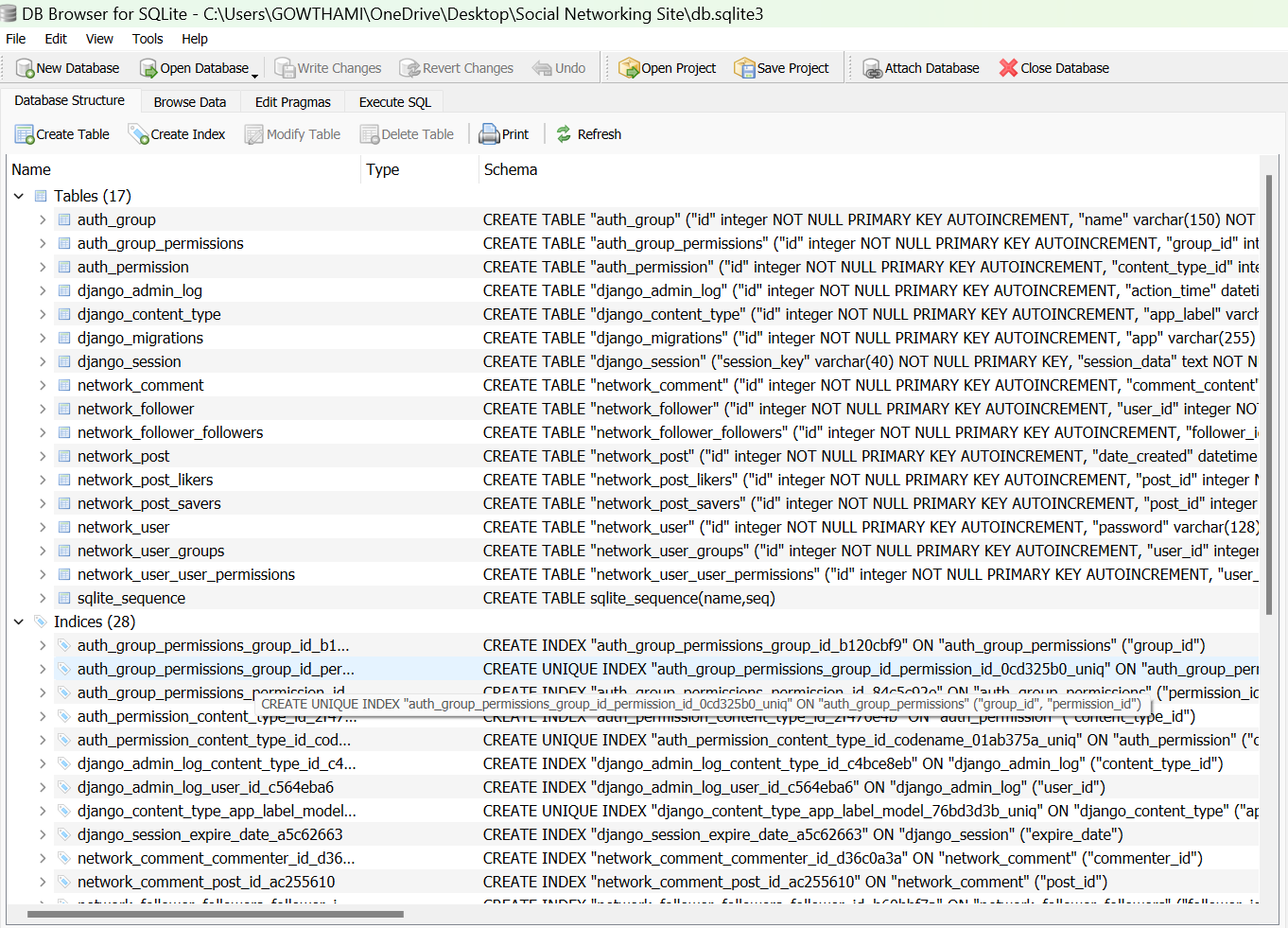
**5.2 Data Privacy**

In this system, users can manage their privacy settings by controlling who can view their profiles and content. This is done through custom settings in the user model and profile views.

**6. Expected Project Output**

**6.1 Frontend page: **

**6.2 Database Tables:**

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**CHAPTER – VI**

**CONCLUSION**

The implementation of the **Social Networking Site** using Django and SQLite3 provides a robust, scalable, and user-friendly platform designed to meet the evolving needs of modern social networking. By leveraging Django’s powerful features for web development and SQLite3 for efficient data management, the system ensures seamless user interaction, robust security, and efficient data handling.

Throughout the project, several core functionalities were successfully implemented, including user authentication, customizable profile management, content sharing, real-time messaging, and privacy control. These features ensure that users have full control over their data and interactions, promoting a secure and personalized online environment.

The platform’s modular design allows for easy scalability, ensuring that it can grow with increasing user demand and future feature integrations. Additionally, the system prioritizes data privacy and security, employing best practices like password hashing, CSRF protection, and secure database interactions, which protect users against common vulnerabilities.

The user interface is designed to be responsive and accessible, allowing users to interact seamlessly across various devices. With real-time notifications, group interactions, and content-sharing capabilities, the system fosters meaningful engagement and collaboration among users.

In conclusion, this social networking site serves as a secure, customizable, and community-driven platform that overcomes the limitations of traditional social media. It offers an innovative solution to creating meaningful, privacy-conscious social interactions, with the potential for future expansion and integration of advanced features. This project demonstrates how modern technologies can be leveraged to create a safe, scalable, and user-centric social networking platform.

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