Project Report

Web Engineering

Course Code: CSE415

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Introduction

The Skill Showcase System is an interactive web-based platform designed to help users share their talents and skills with a broader audience. Users can create posts featuring images, videos, and descriptions of their work, allowing others to view, like, and interact with the content. This creates a dynamic and engaging environment for talent discovery and peer appreciation.

The system is particularly useful for students, freelancers, and professionals who want to maintain an online portfolio, build a personal brand, or gain recognition for their abilities. With features like secure login, personalized profiles, content categorization, and responsive design, the platform ensures a seamless user experience across devices.

By combining multimedia skill presentation with social interaction, the Skill Showcase System encourages learning, creativity, and community-driven growth.

Objective

The primary objective of the Skill Showcase System is to provide a user-friendly and interactive platform where individuals can publicly share their talents and creative work. The system is designed to facilitate content sharing, user engagement, and profile management while maintaining performance, security, and scalability.

Key Objectives:

- **Enable skill sharing:** Allow users to create posts with images, videos, and descriptions to showcase their skills effectively.
- **Support user interaction:** Let other users like and comment on posts, encouraging feedback and recognition.
- **Ensure profile customization:** Provide features to edit profile details such as name, profile picture, and bio to personalize user experience.
- **Prevent duplicate actions:** Restrict users from liking the same post more than once to ensure fairness.
- **Improve discoverability:** Allow posts to be categorized by tags/domains (e.g., Web Development, AI, Design) and support keyword-based search.
- **Promote secure and efficient use:** Ensure user data is stored securely, and media files are optimized for performance.
- **Offer a responsive interface:** Provide a seamless experience across desktop and mobile devices through responsive design.

Methodology

The development of the **Skill Showcase System** followed an iterative and user-centered approach to ensure that the system meets user needs effectively. The process consisted of the following phases:

1. **Requirement Gathering**
    - Conducted a user survey using Google Forms to understand user expectations and preferred features.
    - Collected input from several potential users including students and skill-based learners.
    - Identified core functional and non-functional requirements based on feedback.

2. **System Design**
    - Designed UML diagrams such as Use Case Diagram, Activity Diagram, and Sequence Diagram to visualize system behavior.
    - Created the database schema to define relationships between users, posts, likes, and other relevant data.
    - Designed a responsive UI layout for different devices.

3. **Frontend Development**
    - Built the user interface using HTML, Tailwind CSS, and JavaScript.
    - Developed responsive pages such as home.php, skillPost.php, profile.php, and postDetails.php.

4. **Backend Development**
    - Used PHP for server-side scripting and MySQL for database management.
    - Implemented user authentication, session management, and secure media uploads.
    - Ensured actions like "like once only" through SQL checks.

5. **Testing & Iteration**
    - Performed manual testing after each module to fix bugs and refine the UI/UX.
    - Optimized loading performance, media handling, and database queries.
    - Validated user inputs and ensured feedback messages for all actions.

User Requirement Analysis

To ensure that the Skill Showcase System effectively meets the needs and expectations of its users, a thorough user requirement analysis was conducted. This process involved collecting real-world user insights through Google Form surveys and informal interviews with students and potential users. The gathered feedback was used to identify both functional and non-functional requirements of the system.

Functional & Non-Functional Requirements Table

Functional		**Non-Functional**	
Requirement Description	**Type**	**Requirement Description**	**Type**
The system must allow users to register for an account and securely log in.	Functional	The web application must be fully responsive and accessible on both desktop and mobile devices.	Non-Functional
Users should be able to post skill content with a combination of media (images/videos) and descriptions.	Functional	The system should load within 3 seconds on a standard internet connection.	Non-Functional
Only the owner of a post should have the authority to edit or delete it.	Functional	All user data, including login credentials and profile information, must be securely stored and transmitted.	Non-Functional
Other users should be able to view, like, and comment on skill posts.	Functional	Uploaded media files (images/videos) should be stored and retrieved efficiently.	Non-Functional
Users must have the ability to edit their profile details, including name and profile picture.	Functional	The application should support at least 100 users accessing it concurrently without performance issues.	Non-Functional
Each skill post should have a dedicated page displaying detailed information.	Functional	All system actions (like login, post submission, profile update) must generate appropriate user feedback (success, error, etc.).	Non-Functional
Users should be able to browse profiles of other users and view their posted skills.	Functional	All skill post media must be optimized to ensure fast loading without compromising quality.	Non-Functional

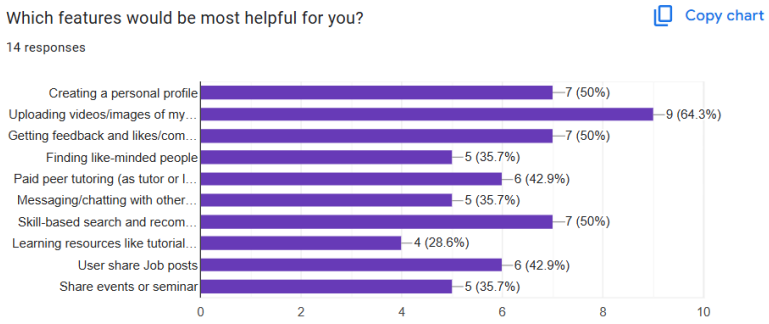
Google Form Feedback Summary

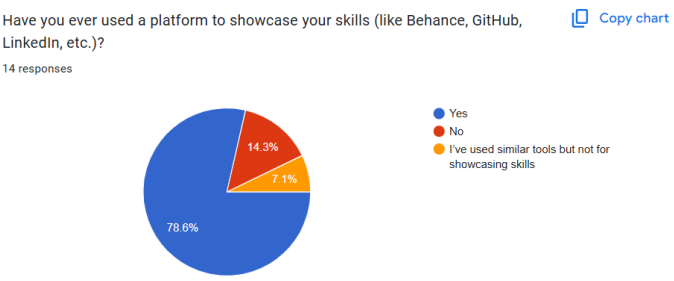
To better understand user needs and expectations, a Google Form was shared with students and potential users. The form collected several responses, and the feedback helped shape the core features of the Skill Showcase System.

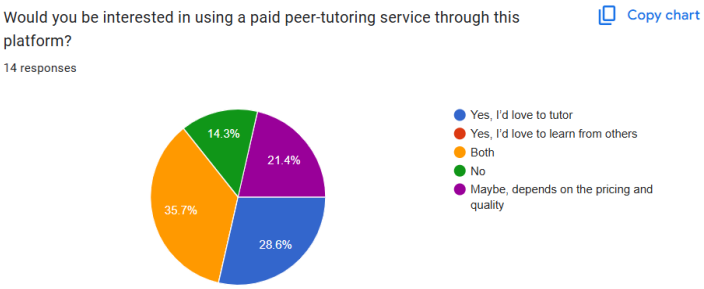
Key Findings from User Responses:

Feature/Feedback	User Interest (%)	Notes
Skill posting with image/video	93%	Users prefer multimedia content to express their skills.
Clean and organized profile view	80%	Simplicity and aesthetics matter for user experience.
Like system with restrictions (no duplicate likes)	70%	Users requested a fair interaction system.
Secure login and data privacy	High	Security is a major concern among all users.

Some Snippet of Google Form Feedback





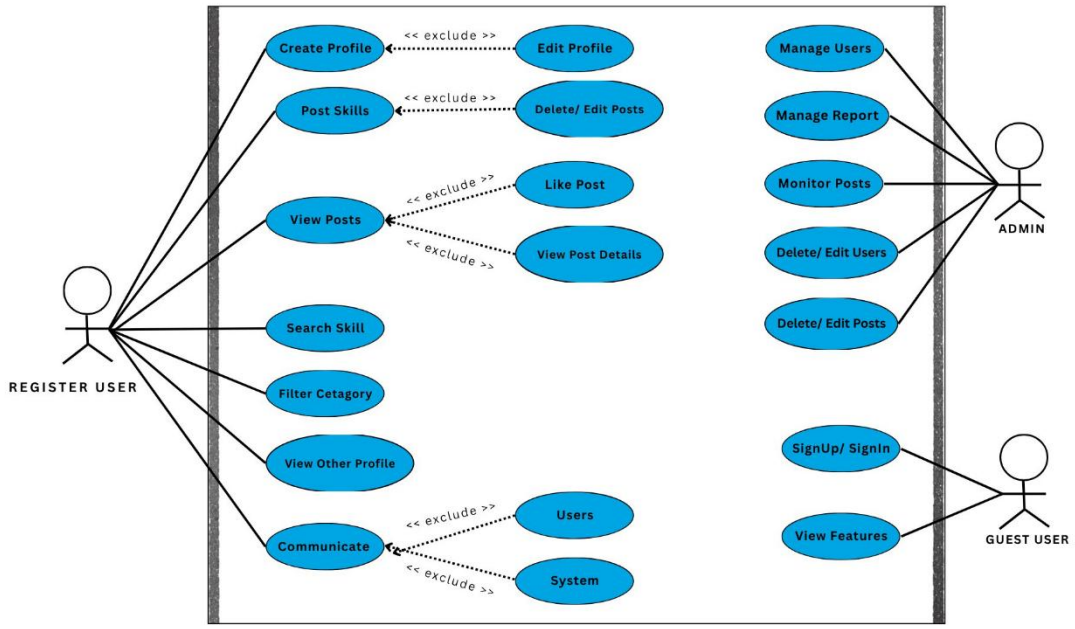


Additional Feature Suggestions (from feedback and project scope):

Additional Feature	Description
Skill-Based Search and Recommendation	Users can search posts by skills or tags, and get suggestions based on their interest or past activity.
Messaging/Chatting	Enables direct communication between users to discuss ideas or collaborate.
Job Posting and Sharing	Users can share job opportunities or freelance gigs within the platform.
Community Building / Like-minded Connections	Helps users find others with similar interests or expertise.

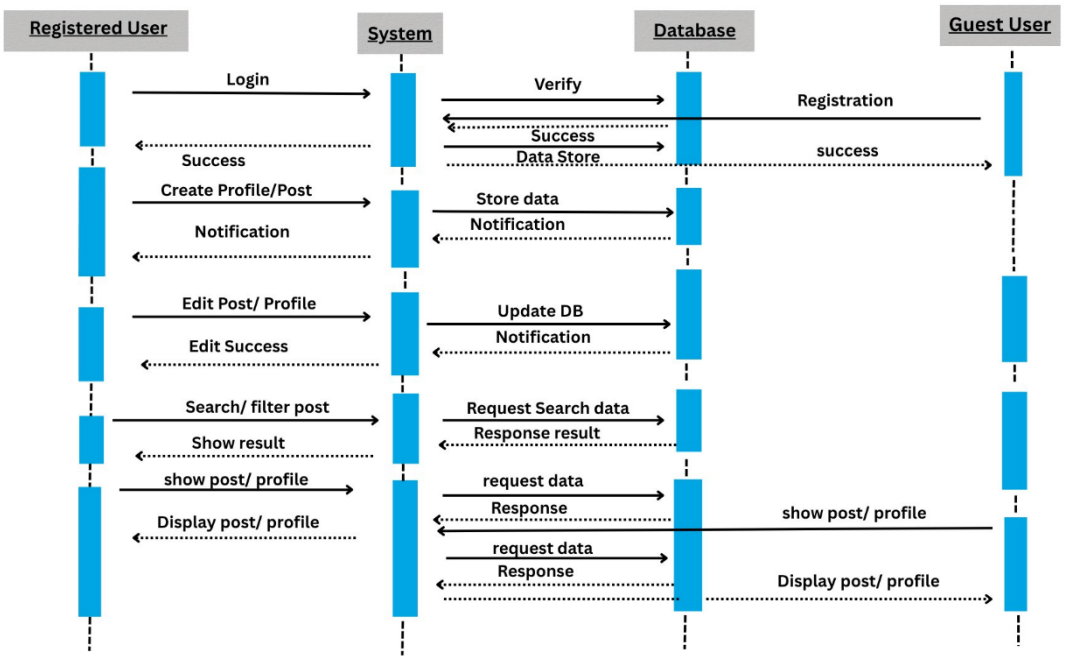
Use Case Diagram

The Use Case Diagram represents the major functionalities of the Skill Showcase System from the user's perspective. It identifies the interactions between various actors (e.g., user, admin) and the core features of the system.



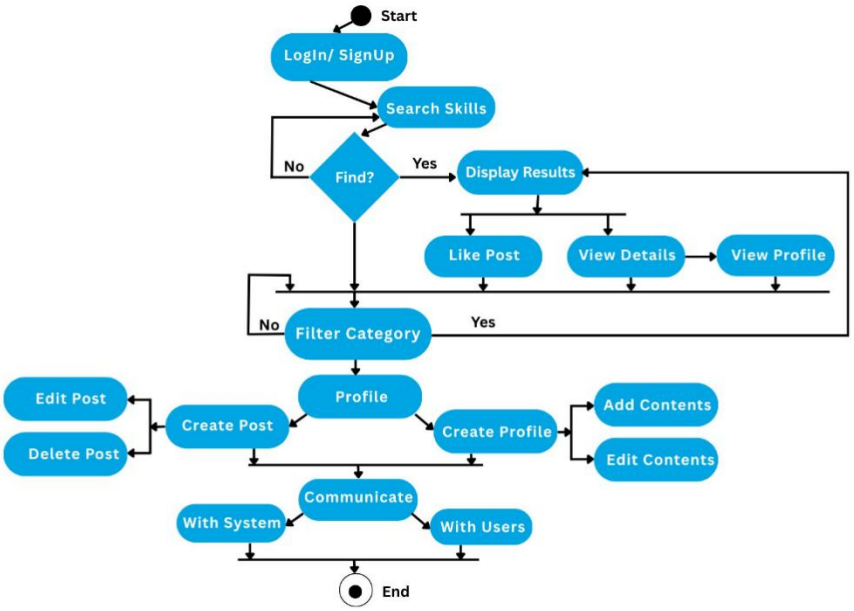
Sequence Diagram

The Sequence Diagram illustrates the interaction flow between different components (user, frontend, backend, and database) during key operations — such as user login, posting a skill, or liking a post. It visually explains the order of messages and actions performed in each process.



Activity Diagram

The Activity Diagram captures the step-by-step workflow of a specific use case in the system. For this project, the diagram can represent processes like posting a skill, liking a post, or editing a profile. It helps visualize the decisions, parallel tasks, and user interactions clearly.



System Architecture (3-Tier)

The Skill Showcase System follows a 3-tier architecture model, which ensures separation of concerns, scalability, and easier maintenance. The system is divided into three distinct layers: Presentation Layer, Logic Layer, and Data Layer.

Tier 1: Presentation Layer (Frontend)

This is the user interface of the application through which users interact directly. It includes web pages for home, profile, skill posting, and post details.

- **Technologies Used**: HTML, Tailwind CSS, JavaScript
- **Pages:** home.php, skillPost.php, profile.php, postDetails.php
- **Features:**
  - Responsive design (desktop and mobile)
  - Display posts and profiles
  - Collect input from users (text/media uploads)

Tier 2: Logic Layer (Business Logic / Server-Side)

This layer handles the core processing and logic of the application. It manages user sessions, validates data, and processes server-side operations.

- **Technologies Used**: PHP
- **Features:**
  - User authentication
  - Session management
  - File upload handling
  - Duplicate like prevention
  - Communication with the database via queries

Tier 3: Data Layer (Database Server)

This layer is responsible for storing and retrieving data. It includes all necessary tables to support user and post management.

- **Technologies Used**: MySQL
- **Main Tables:**
  - Users: Stores user profile information
  - skill_posts: Stores skill post data
  - skill_post_likes: Tracks user likes

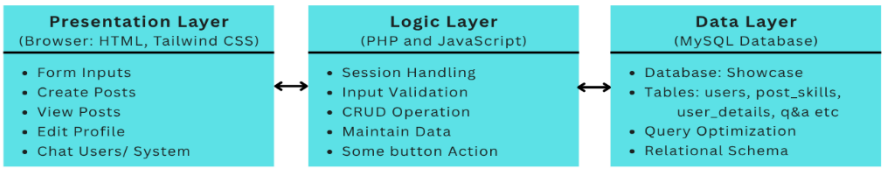


Fig: 3-Tier System Architecture of the Skill Showcase System

Features Overview

The Skill Showcase System offers the following core and extended features to ensure a smooth, interactive, and community-driven user experience.

Feature	Description
Skill Posting	Users can upload a post containing text, images, or videos under specific categories.
Like System	Logged-in users can like posts. Duplicate likes by the same user are prevented.
Profile View	Users can view their own and others' profiles, showcasing posted skills and media.
Post Details Page	Clicking on a post opens a detailed view with full content, media, and user info.
Profile Editing	Users can update their profile picture, name, cover image, and short bio.
Skill-Based Search	Users can search skill posts using keywords, categories, or tags.
Recommendation System	Based on user activity or interests, suggested posts may be shown.
Messaging/Chatting	Enables direct communication between users for collaboration or feedback.
Job Sharing	Users can post or share job opportunities relevant to skill domains.
Find Like-Minded Users	System helps connect users with similar interests or expertise areas.
Admin Management	Admins can manage reported or inappropriate content to maintain platform quality.

Code Snippet (Sample)

This section highlights key backend functionalities of the system using PHP and MySQLi. The following snippets demonstrate how the application manages user data, posts, likes, and file uploads.

1. **Fetching User Profile Picture**
   This snippet retrieves the logged-in user's profile picture from the database.

```
$stmt = $conn->prepare("SELECT profile_picture FROM users WHERE id = ?");
$stmt->bind_param("i", $_SESSION['user_id']);
$stmt->execute();
$stmt->bind_result($profile_picture);
$stmt->fetch();
$stmt->close();
```

2. **Like a Post (Prevent Duplicate Likes)**
   Allows a user to like a post only once using a conditional SQL insert.

```
$stmt = $conn->prepare("INSERT INTO skill_post_likes (user_id, post_id)
SELECT ?, ? FROM DUAL WHERE NOT EXISTS (
  SELECT 1 FROM skill_post_likes WHERE user_id = ? AND post_id = ?
)");
$stmt->bind_param("iiii", $user_id, $post_id, $user_id, $post_id);
$stmt->execute();
```

3. **Posting a Skill (With Media Upload)**
   Handles form data and file upload for creating a new skill post.

```
if ($_SERVER["REQUEST_METHOD"] == "POST") {
    $user_id = $_SESSION['user_id'];
    $title = $_POST['title'];
    $description = $_POST['description'];
    $category = $_POST['category'];
    $mode = $_POST['mode'];
    $duration = $_POST['duration'];
    $tools = $_POST['tools'];
```

```
    $file = $_FILES['media'];
    $filename = uniqid() . "_" . basename($file['name']);
    move_uploaded_file($file['tmp_name'], "../uploads/" . $filename);

    $media_type = explode('/', $file['type'])[0];

    $stmt = $conn->prepare("INSERT INTO skill_posts
    (user_id, title, description, category, mode, duration, tools, media_path, media_type)
    VALUES (?, ?, ?, ?, ?, ?, ?, ?, ?)");

    $stmt->bind_param("issssssss", $user_id, $title, $description, $category, $mode,
$duration, $tools, $filename, $media_type);
    $stmt->execute();
    $stmt->close();
}
```

4. **Update Profile (With or Without New Picture)**

```
if ($_SERVER['REQUEST_METHOD'] == 'POST') {
    $user_id = $_SESSION['user_id'];
    $name = $_POST['name'];
    $bio = $_POST['bio'];

    if (isset($_FILES['profile_picture']) && $_FILES['profile_picture']['error'] === 0) {
        $filename = uniqid() . "_" . $_FILES['profile_picture']['name'];
        move_uploaded_file($_FILES['profile_picture']['tmp_name'], "../uploads/" .
$filename);

        $stmt = $conn->prepare("UPDATE users SET name = ?, bio = ?, profile_picture = ?
WHERE id = ?");
        $stmt->bind_param("sssi", $name, $bio, $filename, $user_id);
    } else {
        $stmt = $conn->prepare("UPDATE users SET name = ?, bio = ? WHERE id = ?");
        $stmt->bind_param("ssi", $name, $bio, $user_id);
    }

    $stmt->execute();
    $stmt->close();
}
```

Conclusion

The Skill Showcase System successfully delivers a web-based platform for users to share their skills through multimedia posts, interact via likes, and explore others' profiles. Designed with a responsive UI and secure backend, it ensures smooth user experience and reliable data handling.

By incorporating real-user feedback and following a structured development process, the system meets both functional and non-functional requirements. Its three-tier architecture and modular design make it scalable for future features like content filtering or notifications.

Overall, the project provides a strong foundation for a community-driven talent-sharing platform with room for future enhancements.

References:

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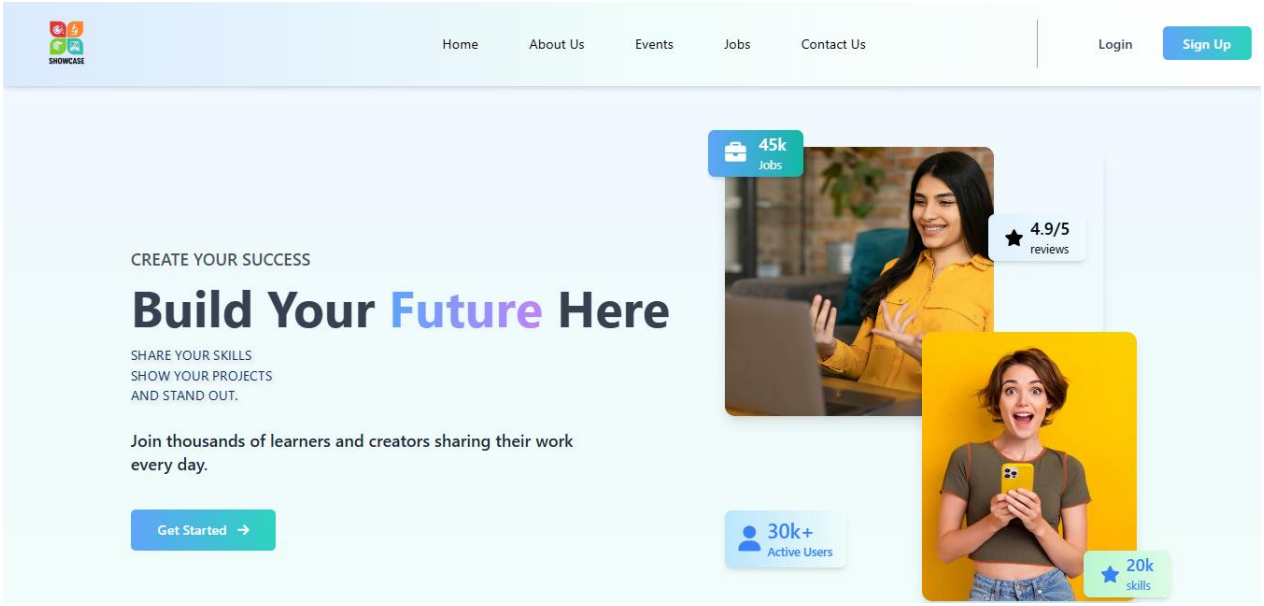
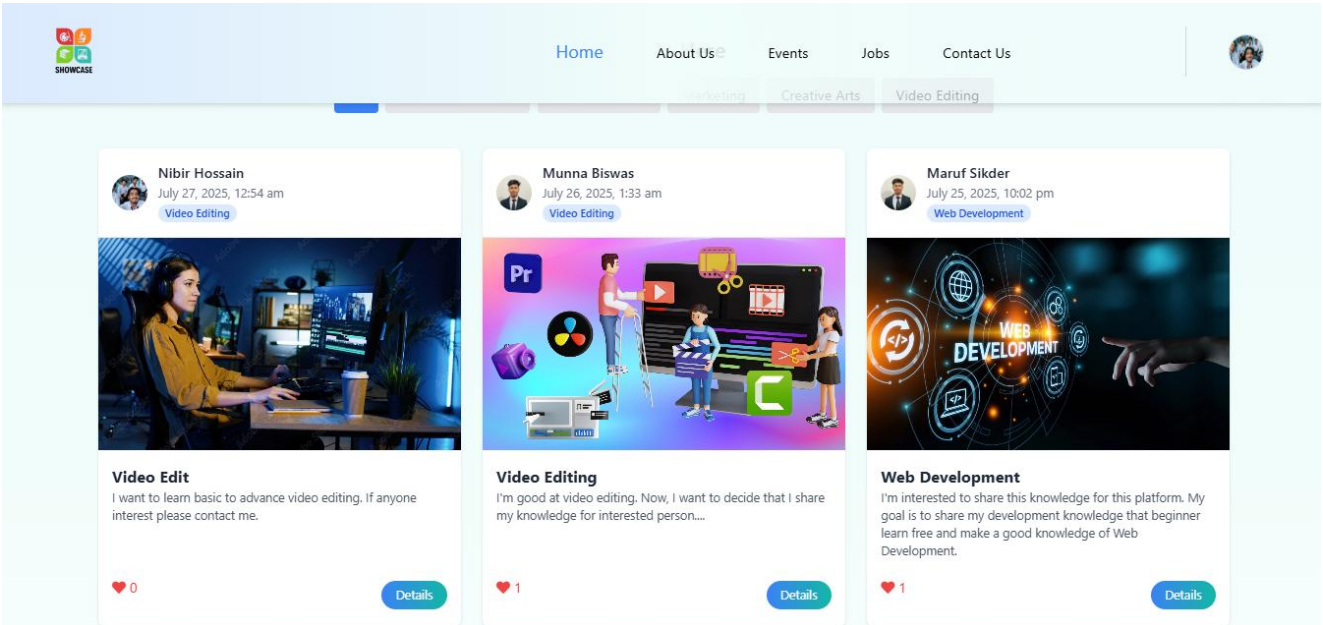
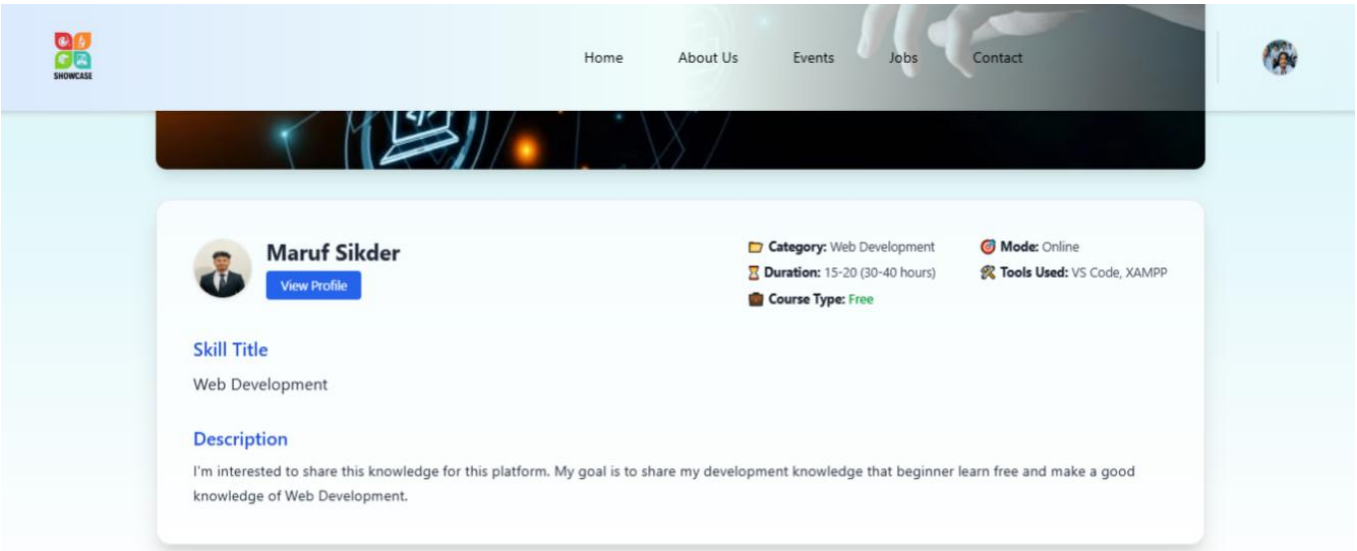
UI/UX Design:

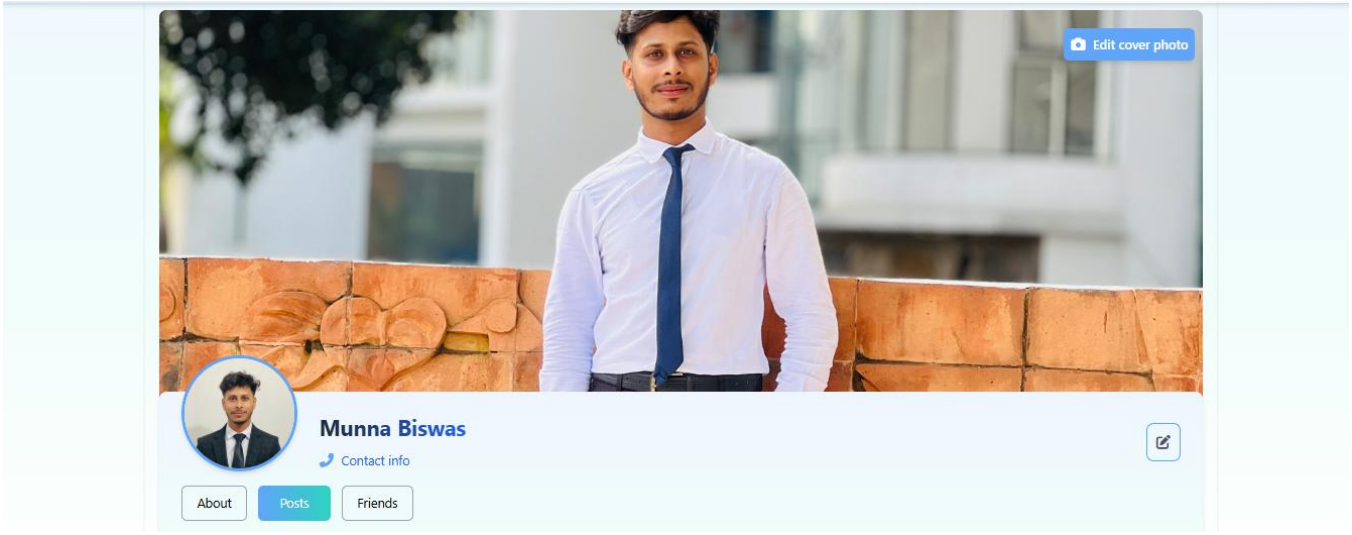
1. Front-End Screenshots



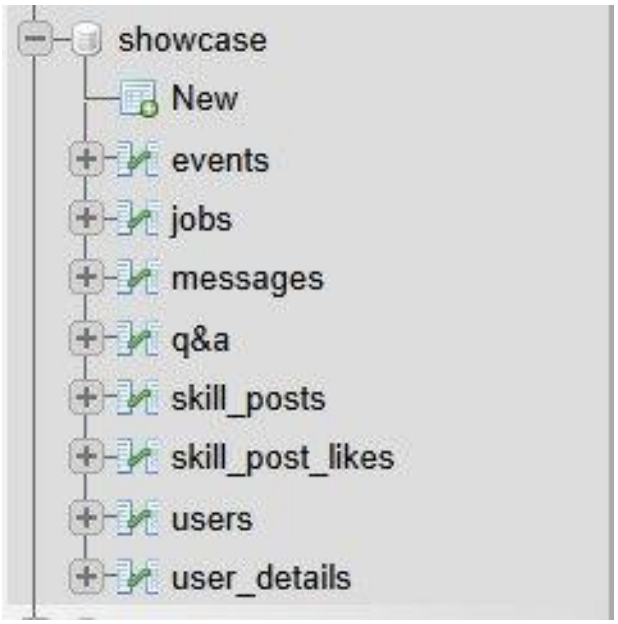




Related Posts



2. **Back-End Screenshots (Database)**



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☐	messages	Browse Structure Search Insert Empty Drop	16	InnoDB	utf8mb4_general_ci	48.0 KiB	-
☐	q&a	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_general_ci	16.0 KiB	-
☐	skill_posts	Browse Structure Search Insert Empty Drop	4	InnoDB	utf8mb4_general_ci	32.0 KiB	-
☐	skill_post_likes	Browse Structure Search Insert Empty Drop	6	InnoDB	utf8mb4_general_ci	32.0 KiB	-
☐	users	Browse Structure Search Insert Empty Drop	3	InnoDB	utf8mb4_general_ci	48.0 KiB	-
☐	user_details	Browse Structure Search Insert Empty Drop	14	InnoDB	utf8mb4_general_ci	16.0 KiB	-
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Check all With selected:

Extra options

	id	name	email	password	cover_photo
Edit Copy Delete	1	Maruf Sikder	marufsikder5051@gmail.com	$2y$10$//VIRSt/edYaaxmLj8wlMeEPJbfDrPMLNCemT2/Gphq...	uploads/1754330197_IMG_3323.JF
Edit Copy Delete	2	Munna Biswas	munna@gmail.com	$2y$10$3/aCE.GowF1aOQ1ELL852e.8N4zkMvNfVZipGdvCBcg...	uploads/1754494351_munna.jpg
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Check all *With selected:* Edit Copy Delete Export

Extra options

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