SocialQ

Project Documentation

This is the document explaining SocialQ.

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Course

Information Management (CC 105)
T/TH (10:00–11:00) • Lec
T/TH (13:00–14:30) • Lab

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3. Introduction

Project Background

This is a simple social media system through which users can post content among a community. The system is intended to support user generated content and discovery of content in the form of a feed. The system intends to build a simple yet interactive platform for users to see each another's activity without the complexity of messaging features.

Objectives

- Provide a platform where users can create accounts.
- Allow users to post content.
- Offer feed of all posts and all posts of a specific user.

Scope

Included Features:

- User registration and login system.
- Post creation.
- Post deletion.
- All posts feed and all posts of a specific user feed.

Excluded Features:

- Private messaging or chat system.
- Image and video uploads or multimedia stories.
- Likes and comments.
- Advanced post analytics or insights.

4. System Overview

System Architecture

The system follows a client-server architecture using a XAMPP stack (cross-platform, Apache, MariaDB, PHP). The development environment is hosted locally using XAMPP, which provides an integrated server stack for running PHP scripts and managing MariaDB (MySQL) databases. The backend uses object-oriented PHP with PDO to interact with the MariaDB database.

Components:

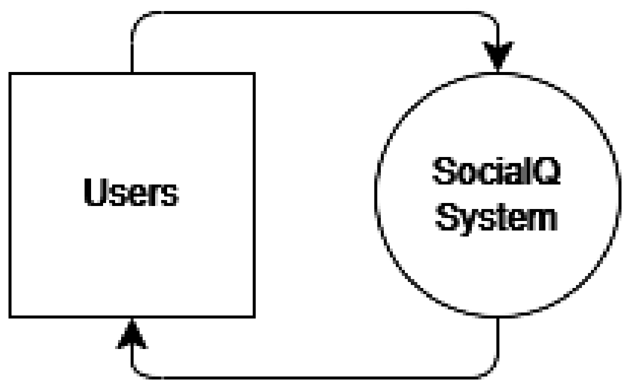
Backend (Web Server with PHP): Processes requests, interacts with the database, manages sessions, and serves content.
Database (MariaDB): Stores user information, posts, likes, comments, and follower relationships.
Make requests: We make requests in Postman directly.

Target Users

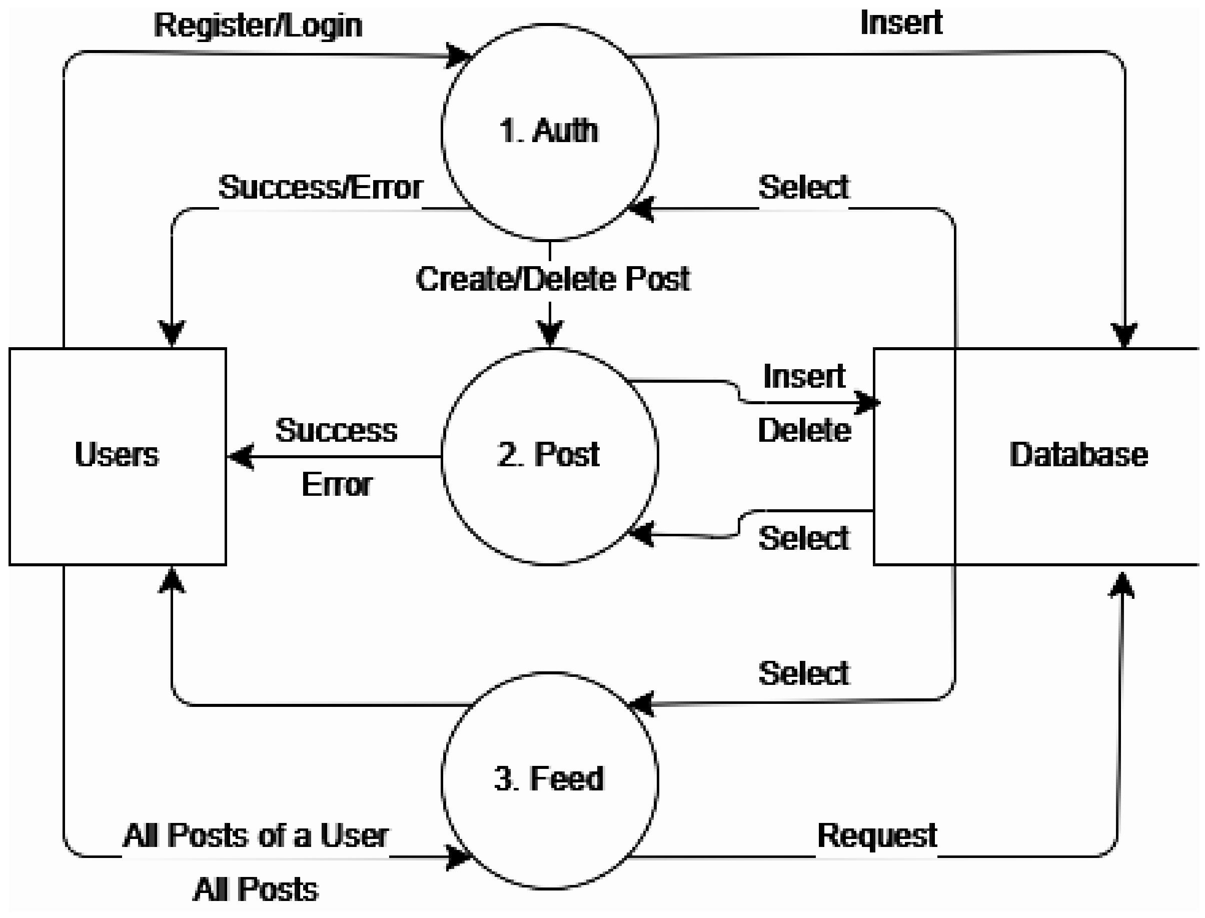
General Users
They can register, log in, post content, delete posts, view posts, etc.

5. Data Modeling

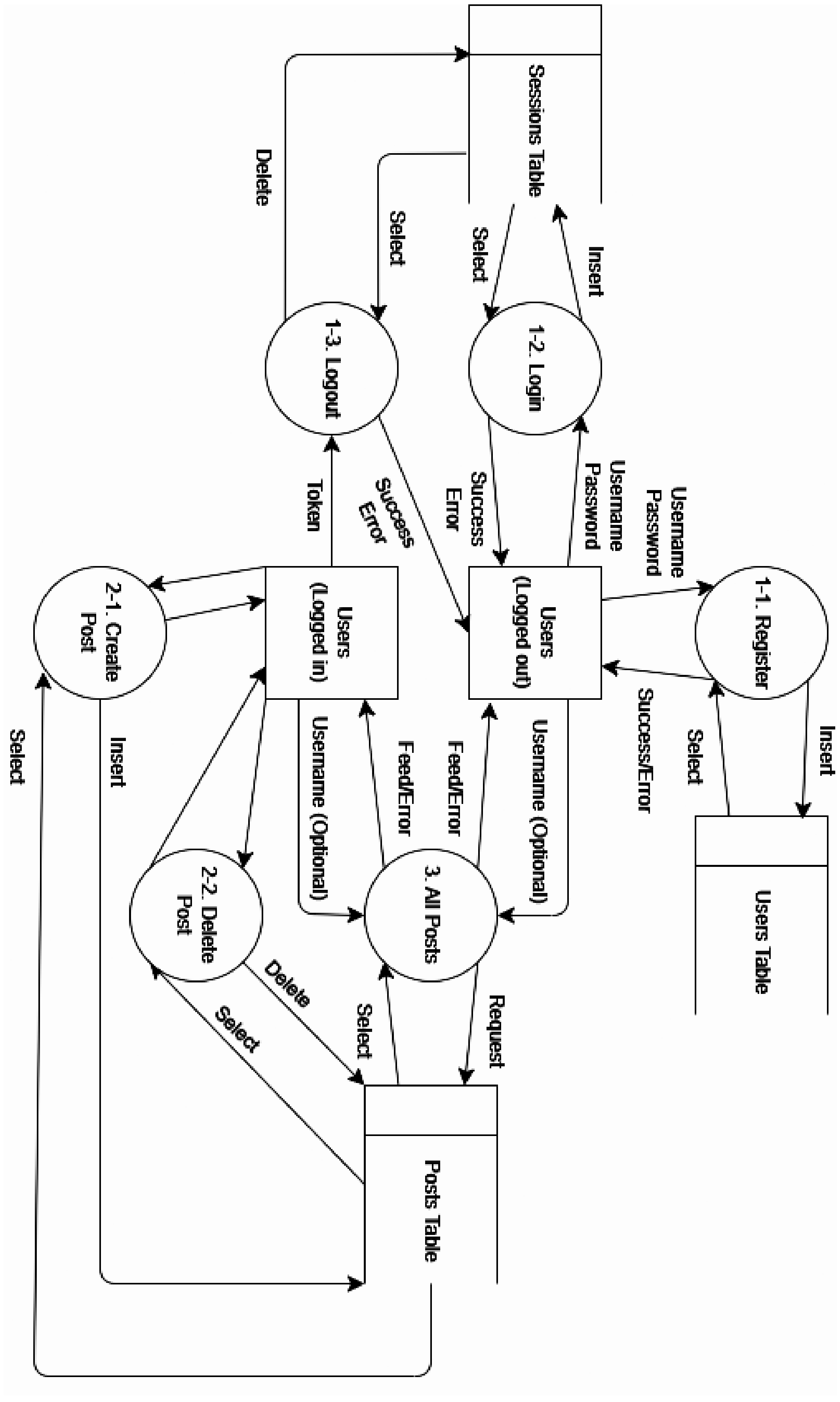
Context Diagram



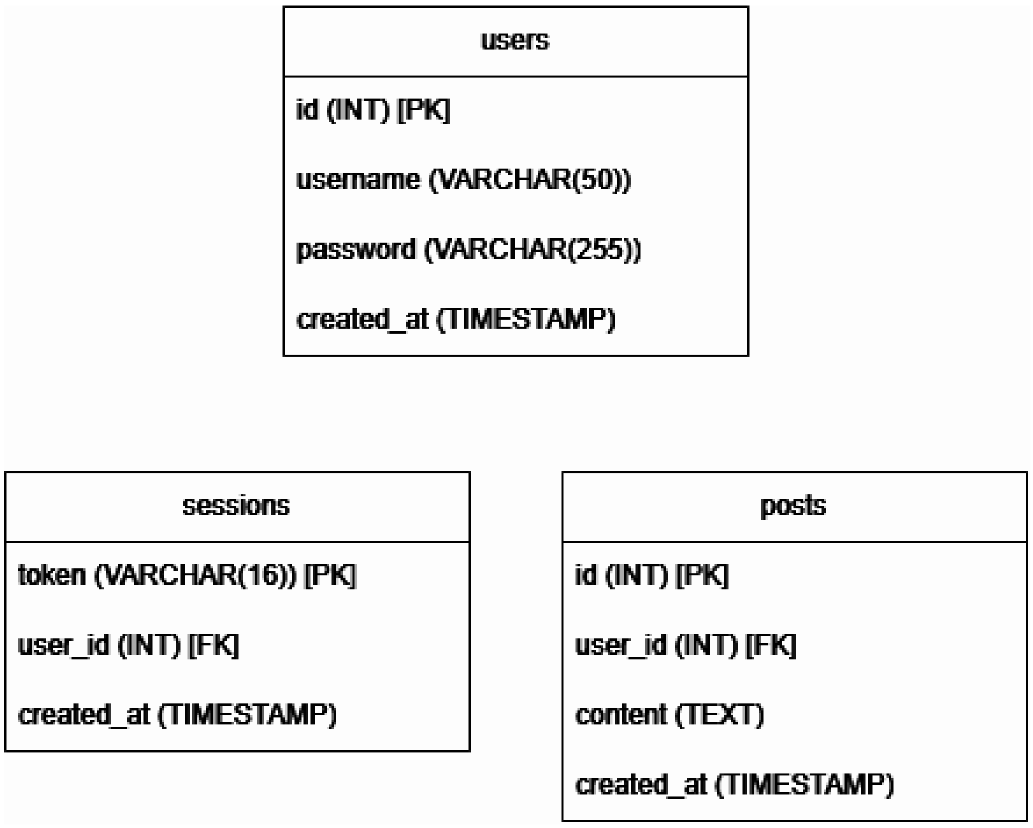
Level 0 Diagram



Level 1 Diagram



Entity Relational Diagram



Data Dictionary

Users Table

Table	Field	Type	Description
users	id	INT, PK	Unique identifier for each user
	username	VARCHAR(50)	Unique username
	password_hash	VARCHAR(255)	Hashed password
	created_at	TIMESTAMP	Account creation time

Posts Table

Table	Field	Type	Description
posts	id	INT, PK	Unique post ID
	user_id	INT, FK → users.id	Author of the post
	content	TEXT	Post content
	created_at	TIMESTAMP	Time of posting

Sessions Table

Table	Field	Type	Description
sessions	token	VARCHAR(16), PK	Unique session token
	user_id	INT, FK → users.id	User to whom the session belongs
	created_at	TIMESTAMP	When the session was created

6. Modules

Module List:

Auth Module, Post Module, Feed Module

Module Details:

Module Name: Auth (Canturias)
Description: Handles user registration, login, and logout

Functionality:

1. Register users

User_Register procedure:

```
BEGIN
  DECLARE user_count INT DEFAULT 0;

  SELECT COUNT(*) INTO user_count FROM users WHERE username = p_username;

  IF user_count > 0 THEN
    SELECT 'Error: Username already exists' AS Record_Status;
  ELSE
    INSERT INTO users (username, password, joined_date)
    VALUES (p_username, p_password, NOW());
    SELECT 'Success' AS Record_Status;
  END IF;
END
```

Prevent duplicate usernames

RegisterUser function in model

```
public static function RegisterUser($username, $password) {
    if(empty($username) || empty($password)) {
      echo json_encode(["Status" => "Error: Username and Password are
required."]);
      return;
    }
    $hashedPassword = password_hash($password, PASSWORD_DEFAULT);
    $params = [$username, $hashedPassword];

    $result = PdoMySQL::ExecuteDML_Query(
      Application::$DBase,
      "CALL User_Register(?, ?)",
      $params
    );
    echo $result;
}
```

2. Login users

User_Login procedure

```
BEGIN
    SELECT id, username, password FROM users WHERE username = p_username
LIMIT 1;
END
```

Select user’s info where usernames match

User_CreateSession procedure

```
BEGIN
    INSERT INTO sessions (user_id, token, login_date)
    VALUES (p_user_id, p_token, NOW())
    ON DUPLICATE KEY UPDATE
      token = VALUES(token),
      login_date = VALUES(login_date);
    SELECT 'Success' AS Record_Status;
END
```

Creates new session for current user

LoginUser function in model

```
public static function LoginUser($username, $password) {
    if(empty($username) || empty($password)) {
      echo json_encode(["Status" => "Error: Username and Password are
required."]);
      return;
    }
    $params = [$username];

    $userDataRaw = PdoMySQL::ExecuteDML_Query(
      Application::$DBase,
      "CALL User_Login(?)",
      $params
    );
    $userData = json_decode($userDataRaw);

    if(empty($userData)) {
      echo json_encode(["Status" => "Error: Invalid username or
password."]);
      return;
    }
    // Verify login
    $storedHash = $userData[0]->password ?? null;
    if(!$storedHash || !password_verify($password, $storedHash)) {
      echo json_encode(["Status" => "Error: Invalid username or
password."]);
      return;
    }
    // If login verified
    $token = bin2hex(random_bytes(8));
    $userId = $userData[0]->id;
    $params = [$userId, $token];

    $sessionResult = PdoMySQL::ExecuteDML_Query(
      Application::$DBase,
      "CALL User_CreateSession(?, ?)",
      $params
    );
    $sessionResultDecoded = json_decode($sessionResult);

    if(isset($sessionResultDecoded[0]->Record_Status) &&
$sessionResultDecoded[0]->Record_Status == "Success") {
      echo json_encode(["Status" => "Login successful.", "Token" =>
$token]);
    }
    else {
      echo json_encode(["Status" => "Error: Failed to create session."]);
    }
  }
```

3. Logout user

User_Logout procedure

```
User_Logout:
BEGIN
    DELETE FROM sessions WHERE token = p_token;
    SELECT 'Success' AS Record_Status;
END
```

Deletes the current session token

LogoutUser function in model

```
public static function LogoutUser($token) {
    if(empty($token)) {
      echo json_encode(["Status" => "Error: Token is required."]);
      return;
    }
    $params = [$token];

    $result = PdoMySQL::ExecuteDML_Query(
      Application::$DBase,
      "CALL User_Logout(?)",
      $params
    );
    echo $result;
  }
```

Module Name: Post (Ajero)
Description: Enables users to create and delete posts

Functionality:

1. Create posts

Post_Create procedure

```
BEGIN
    DECLARE v_user_id INT;

    SELECT user_id INTO v_user_id FROM sessions WHERE token = p_token
LIMIT 1;

    IF v_user_id IS NULL THEN
        SELECT 'Error: Invalid or expired token' AS Record_Status;
    ELSE
        INSERT INTO posts (user_id, post_content, posted_date)
        VALUES (v_user_id, p_post_content, NOW());

        SELECT 'Success: Post created' AS Record_Status;
    END IF;
END
```

Inserts the new post into the posts table with current timestamp using NOW() function.

CreatePost function in model

```
public static function CreatePost($token, $post_content)
  {
    if (empty($token) || empty($post_content))
    {
      echo json_encode(["Status" => "Error: Token and post content are
required."]);
      return;
    }

    try
    {
      $params = [$token, $post_content];
      $result = PdoMySQL::ExecuteDML_Query(Application::$DBase, "CALL
Post_Create(?, ?)", $params);

      if (!empty(trim($result)))
      {
        echo $result;
      }
      else
      {
        echo json_encode(["Status" => "Error: Failed to create post."]);
      }
    }
    catch (Exception $error)
    {
      echo json_encode(["Status" => "Error: " . $error->getMessage()]);
    }
}
```

---

2. Delete posts

Post_Delete procedure

```
BEGIN
    DECLARE v_user_id INT;
    DECLARE v_user_post_id INT;

    SELECT user_id INTO v_user_id FROM sessions WHERE token = p_token
LIMIT 1;
    SELECT user_id INTO v_user_post_id FROM posts WHERE id = p_post_id AND
user_id = v_user_id LIMIT 1;

    IF v_user_id IS NULL THEN
        SELECT 'Error: Invalid or expired token' AS Record_Status;
    ELSEIF v_user_post_id IS NULL THEN
        SELECT 'Error: This is not your post' AS Record_Status;
    ELSE
        DELETE FROM posts WHERE id = p_post_id;
        SELECT 'Success: Post deleted' AS Record_Status;
    END IF;
END
```

Deletes a post in the posts table if the user owns it.

CreatePost function in model

```
public static function DeletePost($token, $post_id)
  {
    if (empty($token) || empty($post_id))
    {
      echo json_encode(["Status" => "Error: Token and post ID are
required."]);
      return;
    }

    try
    {
      $params = [$token, $post_id];
      $result = PdoMySQL::ExecuteDML_Query(Application::$DBase, "CALL
Post_Delete(?, ?)", $params);

      $decodedResult = json_decode($result, true);
      if (!empty($decodedResult) && is_array($decodedResult))
      {
        $record = $decodedResult[0]['Record_Status'] ?? null;

        if (!empty($record))
        {
          echo json_encode(["Status" => $record]);
        }
        else
        {
          echo json_encode(["Status" => "Error: Unexpected response
format."]);
        }
      }
      else
      {
        echo json_encode(["Status" => "Error: Failed to delete post."]);
      }
    }
    catch (Exception $error)
    {
      echo json_encode(["Status" => "Error: " . $error->getMessage()]);
    }
}
```

Module Name: Feed (Guido)
Description: Enables users to create posts

Functionality:

1. View all posts of specific user

User_Post procedure

```
BEGIN
  SELECT
    p.id AS post_id,
    u.username,
    p.post_content,
    p.posted_date
  FROM posts p
  JOIN users u ON p.user_id = u.id
  WHERE u.username = in_username
  ORDER BY p.posted_date DESC;
END
```

UserPosts function in model

```
public static function UserPosts($username) {
    if(empty($username)) {
      echo json_encode(["Status" => "Error: Username parameter is
required."], JSON_UNESCAPED_UNICODE);
      return;
    }

    try {
      $result = PdoMySQL::ExecuteDML_Query(Application::$DBase, "CALL
User_Posts(?)", [$username]);

      if (!empty(trim($result))) {
        echo $result;
      }
      else {
        echo json_encode(["Status" => "Error: No posts found for this
user."], JSON_UNESCAPED_UNICODE);
      }
    }
    catch(Exception $e) {
      echo json_encode(["Status" => "Error: " . $e->getMessage()],
JSON_UNESCAPED_UNICODE);
    }
}
```

---

2. View all posts of all users

All_Posts procedure

```
BEGIN
  SELECT
    p.id AS post_id,
    u.username,
    p.post_content,
    p.posted_date
  FROM posts p
  JOIN users u ON p.user_id = u.id
  ORDER BY p.posted_date DESC;
END
```

AllPosts function in model

```
public static function AllPosts() {
    try {
      $result = PdoMySQL::ExecuteDML_Query(Application::$DBase, "CALL
All_Posts()");

      if(!empty(trim($result))) {
        echo $result;
      }
      else {
        echo json_encode(["Status" => "Error: No posts found."],
JSON_UNESCAPED_UNICODE);
      }
    }
    catch(Exception $e) {
      echo json_encode(["Status" => "Error: " . $e->getMessage()],
JSON_UNESCAPED_UNICODE);
    }
}
```

7. Transaction Entries

Transaction Entry List

- User Registration
- User Login
- Create Post
- View All Posts
- View All of a User’s Posts
- Logout

Transaction Entry Details

Transaction Name: User Registration
Description: Registers a new user
Input Data: Username, Password
Process: User_Register procedure checks for availability, then inserts
Output: Success or Username already exists status

Transaction Name: User Login
Description: Authenticates user
Input Data: Username, Password
Process: User_Login selects user info, LoginUser function verifies, User_CreateSession creates a session or Invalid username or password
Output: Success or incorrect username/password, session token

Transaction Name: Create Post
Description: Creates a new post
Input Data: Session Token, Content
Process: Post_Create inserts record into posts
Output: Success post created or invalid token

Transaction Name: Delete Post
Description: Deletes a post
Input Data: Session Token, Post ID
Process: Post_Delete checks if you own the post before deleting
Output: Success post deleted or invalid token or not allowed

Transaction Name: View All Posts
Description: Retrieves all posts from database
Input Data: None
Process: All_posts
Output: List of all posts

Transaction Name: View All of a User’s Posts
Description: Retrieves all posts of a specific user from database
Input Data: Username
Process: User_posts
Output: List of all posts from a specific user or invalid username

Transaction Name: Logout
Description: Ends session
Input Data: Token
Process: User_Login deletes session from sessions tab;e
Output: Session removed or invalid token

8. Reports

Transaction Reports:

All Posts Report

Report Details:

Report Name: All Posts Report
Description: Lists all posts made on the platform from newest to oldest
Data Sources: posts, users
Report Format: JSON
Frequency: On-demand, can be generated by users

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9. GUI and API Manuals

Refer to the API Documentation