



Bilkent University

Department of Computer Engineering

Database Systems Project

Project: Collaborative Hypertext Dictionary

Weblink: <https://github.com/gunduzhuseyn/CS353Bilkent>

Final Report

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Table Of Contents

Table Of Contents	2
Description	3
E/R Diagram	4
List Of Tables	5
Implementation Details	6
Advance DB Features	7
Secondary Indices	7
Advance Features	7
Views	7
Entry Combined View	7
Definition:	7
Usage:	7
Topic Combined View	8
Definition:	8
Usage:	8
Triggers	8
Definition:	8
Reports	9
User Stats	9
Query:	9
Output:	9
Topic Stats	9
Query:	9
Output:	9
User's Manual	10

Description

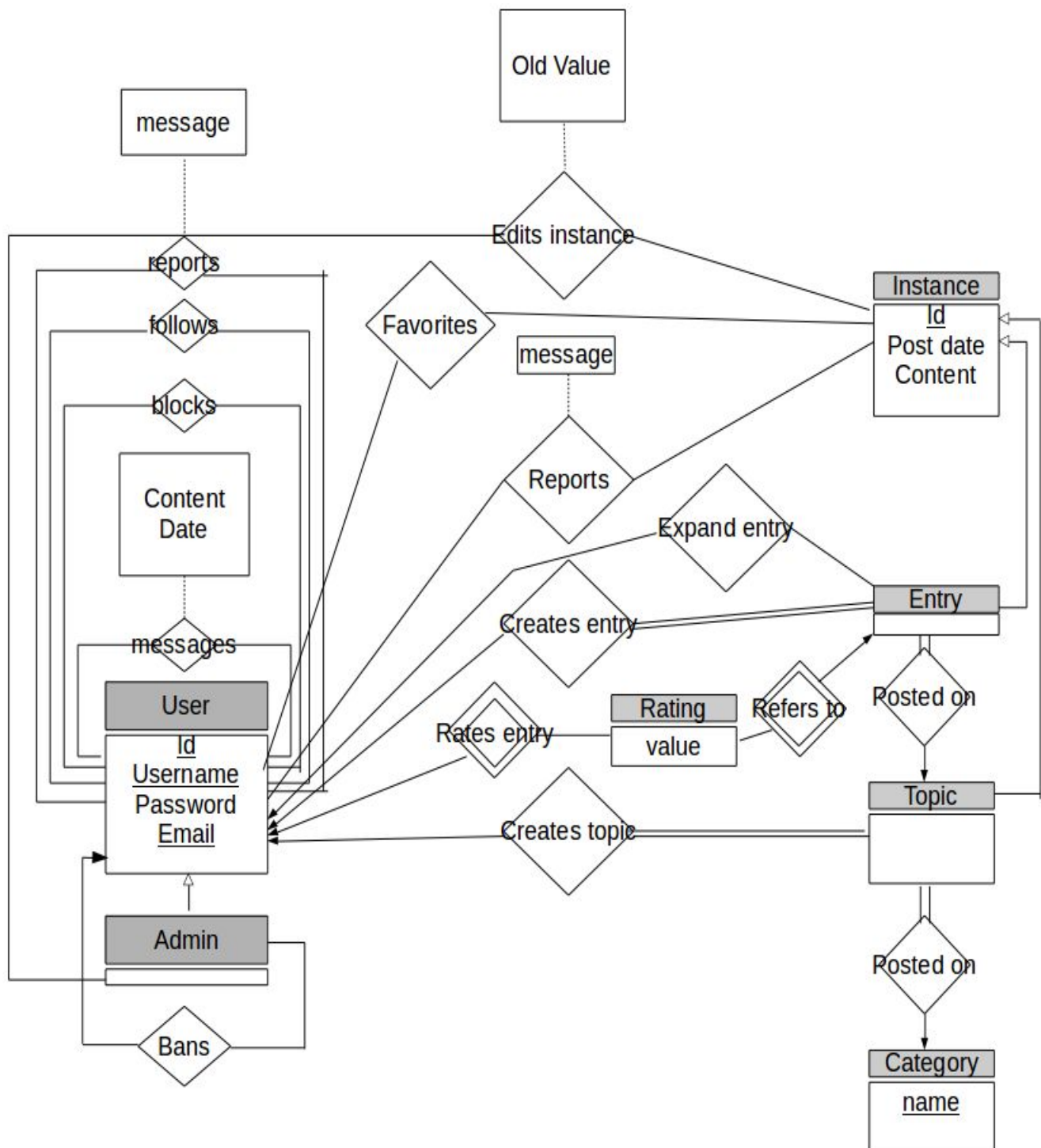
Servo is an online platform for its users to serve as an online platform where they can easily create, define and rate topics, and engage with each other. By using our platform, our users will be able to come up with creative and fun descriptions for any topic, follow their favorite writers, and brighten up their days.

We are allowing our users to interact with Servo in three different groups. First being simple guest users that have not registered or logged in to the platform. They will simply be able to search and view the topics on the homepage, visit each topic page and see the entries. They will be also able to visit the users' profiles and see their details. However, they are only limited to these interactions, as they are required to register and log in to the system to be able to interact with Servo further.

As a second type of users, our registered and logged in users are entitled to create new topics, and write entries to the already existing topics. They are also able to edit their own entries by extending them. However, they are not allowed to delete any entry or topic. They can rate other entries by giving +1 or -1 points, and report them if they think the entries should not be in the Servo. Additionally, they can favorite the topics, to easily access them, and also interact with other users by following/unfollowing them, messaging, and blocking/unblocking other them.

As the last type of users, admins are able to operate as a registered user, and have additional access to the Servo platform. To start with, they are responsible for creating categories for the topics. Also they are responsible for viewing the reports of posts, and delete the according posts. They finally have the right to ban misbehaving users, and delete their accounts.

E/R Diagram



List Of Tables

User(ID, username, email, password, isAdmin, isBanned)

UserMessage(messageContent, messageDate, senderID, receiverID)
FOREIGN KEY (`receiverID`) REFERENCES `User`(`ID`)
ON DELETE CASCADE,
FOREIGN KEY (`senderID`) REFERENCES `User`(`ID`)
ON DELETE CASCADE);

UserBlock(blockerID, blockedID)
FOREIGN KEY (`blockerID`) REFERENCES `User`(`ID`)
ON DELETE CASCADE,
FOREIGN KEY (`blockedID`) REFERENCES `User`(`ID`)
ON DELETE CASCADE);

UserFollow(followerID, followedID)
FOREIGN KEY (`followerID`) REFERENCES `User`(`ID`)
ON DELETE CASCADE,
FOREIGN KEY (`followedID`) REFERENCES `User`(`ID`)
ON DELETE CASCADE);

AdminBan(adminID, bannedID, date)
FOREIGN KEY (`adminID`) REFERENCES `User`(`ID`)
ON DELETE CASCADE,
FOREIGN KEY (`bannedID`) REFERENCES `User`(`ID`)
ON DELETE CASCADE);

AdminHistory(adminID, instanceID, oldValue, date, isInstanceTopic)
FOREIGN KEY (`adminID`) REFERENCES `User`(`ID`)
ON DELETE CASCADE);

Report(userID, message, reportedID, date, reportType)
FOREIGN KEY (`userID`) REFERENCES `User`(`ID`)
ON DELETE CASCADE);

Entry(ID, date, content, userID, topicsID, rating)
FOREIGN KEY (`userID`) REFERENCES `User`(`ID`),
FOREIGN KEY (`topicsID`) REFERENCES `Topic`(`ID`);

Topic(ID, date, content, userID, categoryName)

```
FOREIGN KEY (`userID`) REFERENCES `User`(`ID`),  
FOREIGN KEY (`categoryName`) REFERENCES `Category`(`name`) );
```

Category(name)

Rating(userID, entryID, value)

```
FOREIGN KEY (`userID`) REFERENCES `User`(`ID`),  
FOREIGN KEY (`entryID`) REFERENCES `Entry`(`ID`) );
```

Favorite(userID, instanceID, isInstanceTopic)

```
FOREIGN KEY (`userID`) REFERENCES `User`(`ID`));
```

Implementation Details

Our system consists of two parts: the database and the website. For managing the database we used MySQL and we are running it in a localhost using PhpMyadmin as an interface. In the database the tables are well specified and we tried to keep them as small as possible. Also to make our work easier we use views.

To implement the website we used PHP, HTML, CSS, Bootstrap and a little bit of JavaScript.

For a better user interface we use HTML and CSS with the help of Bootstrap. HTML is all the time used together with PHP to make the back-end front-end connection. The back-end of the system is implemented on PHP as almost all the functions are in PHP and also the connection to the database and the queries are all done with the help of PHP integrating MySQL.

First we had a hard time with the user interface as none of us was very good in HTML and CSS so we decided to leave it to one of the group members. Then we were suggested Bootstrap and we had just a few days of time left. Thankfully we managed to configure our system with it on time.

Advance DB Features

Secondary Indices

We are using the following secondary indices in our database for most frequently used entries:

```
CREATE INDEX report_username_index USING BTREE ON Report(userID);
CREATE INDEX entry_username_index USING BTREE ON Entry(userID);
CREATE INDEX topic_username_index USING BTREE ON Topic(userID);
```

Advance Features

Views

Entry Combined View

Definition:

Combines, owners names, and entry rankings with entries.

```
CREATE VIEW `Servo`.`Entry_Combined_View` AS
  SELECT
    Entry.rating,
    Entry.content,
    Entry.ID,
    User.ID AS userID,
    User.username,
    Entry.date,
    Topic.ID AS topicsID,
    Topic.content AS topicName
  FROM User, Topic, Entry
  WHERE (Entry.userID = User.ID) && (Entry.topicsID = Topic.ID)
  GROUP BY Entry.ID
```

Usage:

```
In topic.php: $sql = "SELECT content, userID, username FROM Entry_Combined_View WHERE topicsID
= '$topicsID'";
```

Topic Combined View

Definition:

Combines topics with owner names.

```
CREATE VIEW `Servo`.`Topic_Combined_View` AS
  SELECT
    User.username,
    Topic.ID,
    Topic.content,
    Topic.categoryName,
    Topic.userID,
    Topic.date
  FROM User, Topic
  WHERE (Topic.userID = User.ID)
```

Usage:

```
In home.php: $lastftopicsql = "SELECT * FROM Topic_Combined_View WHERE userID IN (SELECT ID
AS UName FROM User JOIN UserFollow ON (UserFollow.followedID = User.ID && followerID =
'$userID')) ORDER BY date DESC";
```

Triggers

Definition:

The rating value should be updated when a user gives a new rating to an entry

```
CREATE trigger userrating after insert on Rating
referencing new row as newrow
FOR each row
WHEN exists (SELECT R.value
              FROM Rating R
              WHERE newrow.userId = R.userId )
BEGIN atomic
  update Entry
  set rating = (select rating
                from Rating R
                group by R.entryID)
  where Entry.ID = newrow.ID;
end;
```


Reports

The admins of the site will be able to access all of the reports from their respective settings pages.

User Stats

This report will show a table of users with their total number of topics and entries posted. Topic Stats

Query:

```
SELECT username, COUNT(ID) as TopicNum
FROM Topic_Combined_View
GROUP BY username ORDER BY TopicNum DESC;
```

```
SELECT username, COUNT(ID) as EntryNum
FROM Entry_Combined_View
GROUP BY username ORDER BY EntryNum DESC;
```

Output:

#	Username	Total Topics	Total Entries
1	Ali	10	5
2	Veli	15	50

Topic Stats

This report will show all of the topics in the website along with their total number of entries.

Query:

```
SELECT topicName, COUNT(ID) as EntryNum
FROM Topic_Combined_View
GROUP BY topicName ORDER BY EntryNum DESC;
```

Output:

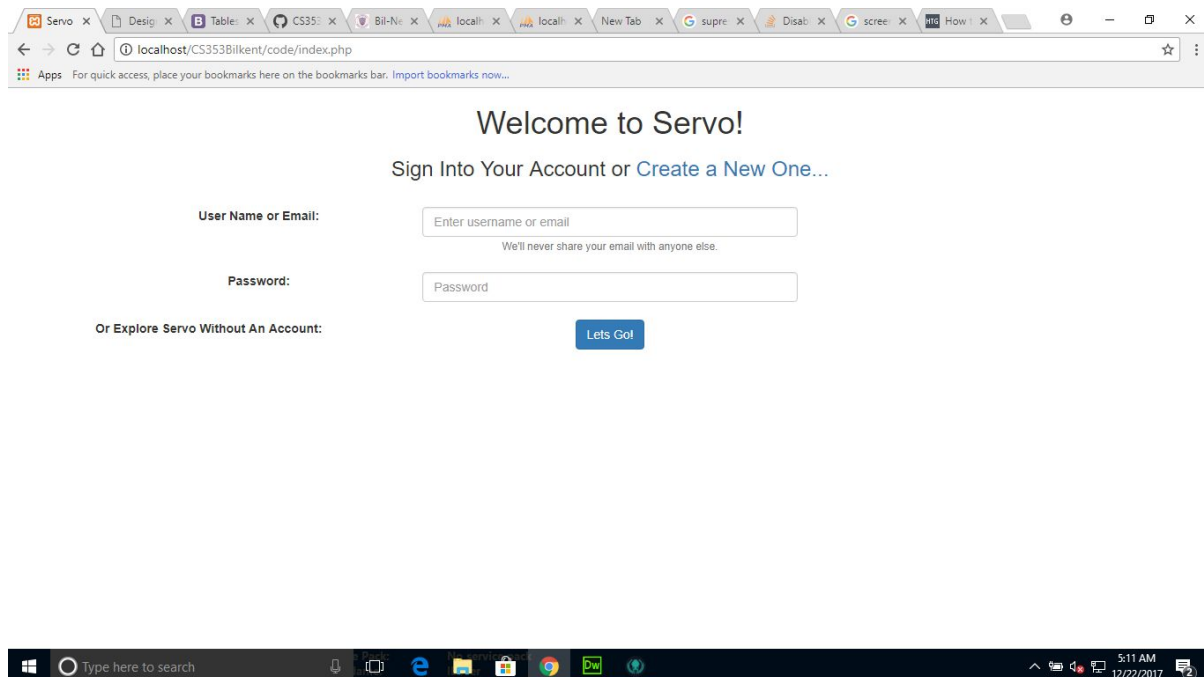
#	Topic Name	Total Entries
---	------------	---------------

1	Cars	20
2	Moon	50

User's Manual

Index Page

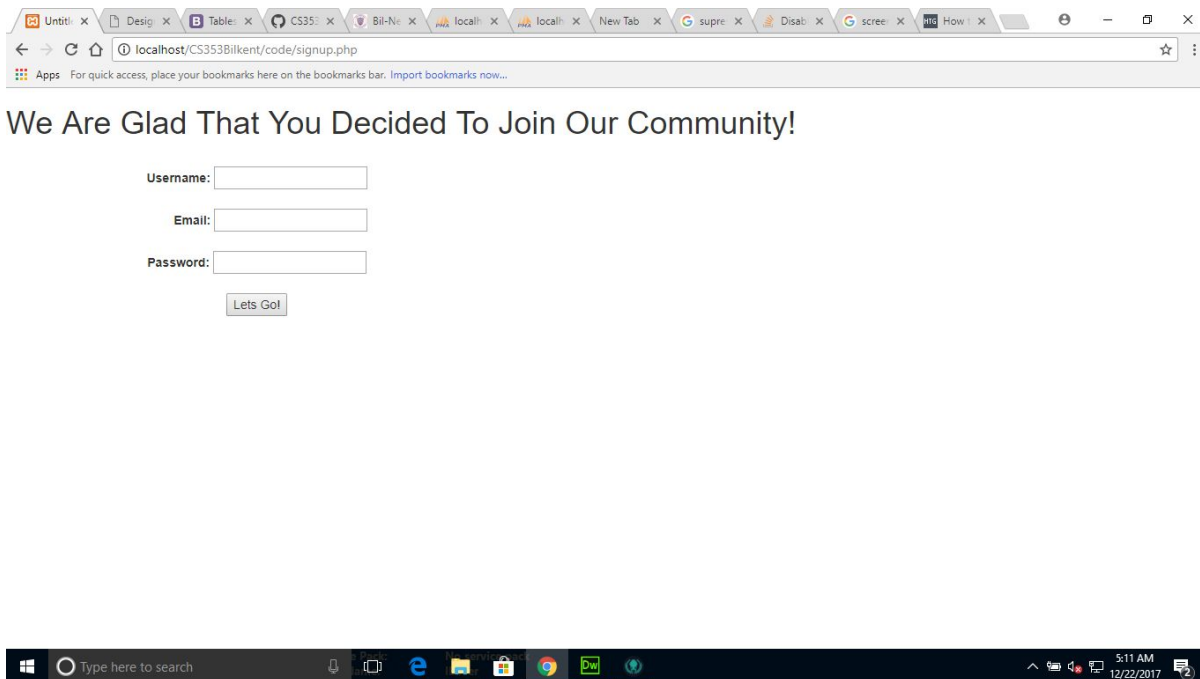
The following picture shows the index page for our application. This is the first page where you land when you access our webpage. You can go to signup page, by clicking on “Create A New One”, if you want to register as a user. If you have already registered, you can write your email/username, and password, then go to home page by clicking on “Let’s Go”. The credentials should only include characters from English alphabet and numbers. If you have forgotten your password, you can go to reset page by clicking on the “Reset Password?” button. You can simply continue to the home page by not providing any credentials, and clicking on “Let’s Go”.



The screenshot shows a web browser window with the URL `localhost/CS353Bilkent/code/index.php`. The page has a white background and a blue header. The main content area is titled "Welcome to Servo!" and includes a link to "Sign Into Your Account or Create a New One...". Below this, there are two input fields: "User Name or Email:" and "Password:". The "User Name or Email:" field has a placeholder text "Enter username or email" and a small note below it: "We'll never share your email with anyone else." The "Password:" field has a placeholder text "Password". Below these fields, there is a link "Or Explore Servo Without An Account:" and a blue button labeled "Lets Go!". The browser's taskbar at the bottom shows the Windows logo, a search bar, and several open applications including Chrome, Firefox, and a file explorer. The system clock in the bottom right corner shows "5:11 AM 12/22/2017".

Signup Page

This is the page for registering as a user. You can register by providing username, email, and password. All should include only characters from the English alphabet and numbers. Email should be in correct format, and include @ character. Also you are not allowed to use an already registered username or email. When you click “Let’s Go”, if registration was successful, you will taken to home page and be logged in.



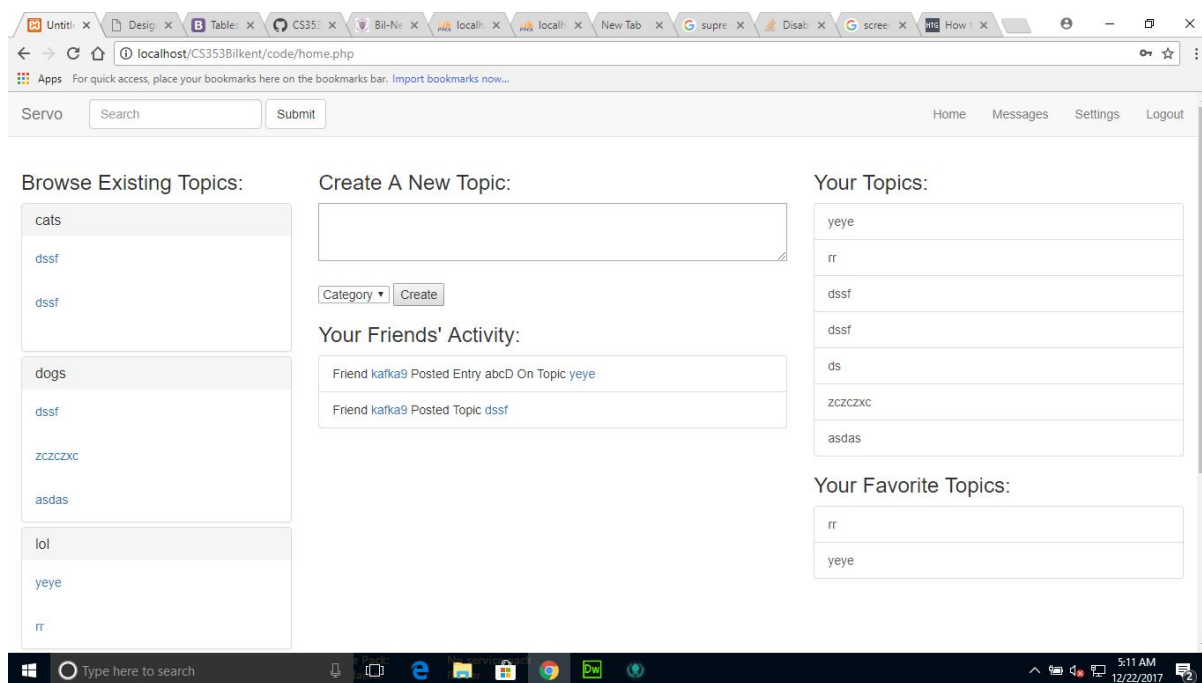
Username:

Email:

Password:

Home Page

This is the home page where our users will be able to mainly interact with. On this page users will be able to browse through different categories and topics under those categories, using the explorer on the left side of the page, and search for a specific Topic, Entry, or other Users using the search bar in the middle-top of the page. The middle of the page will act like a feed showing topics and entries. If they are logged in, these entries will first belong to the users they are following and/or their favorite topics. At the top of the page there will be a navigation bar that will help the user to easily navigate through the platform. At the right side, the list of topics posted by the user will be displayed in chronological order. This will be empty if the user has not logged in, or have no posts to show. And on the bottom right corner of the page, the list of favorite topics of the user will be posted, again in chronological order, again provided that user has logged in. Finally user will be able to create a new topic, by using the form in the top middle part of the page, if he is logged in. Otherwise, this field, will not be visible to the guest user.



Topics Page

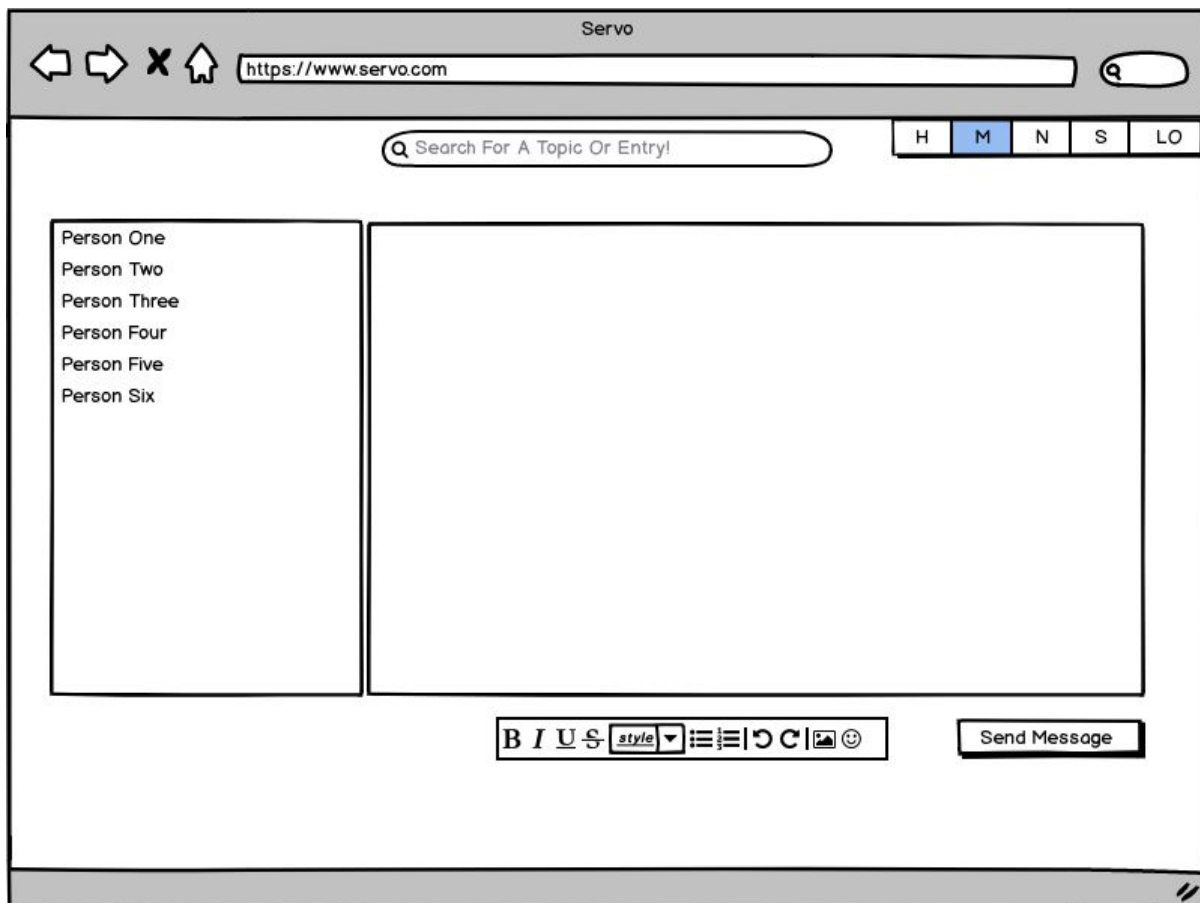
This page is to view/interact with the topics. The middle column of the page includes the Topic under discussion. On the top of this column, the name of the topic is written, along with the buttons to report or favorite it. Below that, there are entries posted on the following topic. The entries have points associated with it. Each logged in user can either add 1 to the points or subtract 1 from them. An option to add a new entry is also be displayed for logged in users. A logged in user may add as many entries as many he/she wants to. However, previous entries or topics can not be deleted. New content might be added to them by clicking on the Expand button. The usernames of the users who post the topics/entries will also be displayed.

The wireframe illustrates a web browser window titled "Servo" with the address "https://www.servo.com". The page is divided into three main sections:

- Left Sidebar:** Contains a list of categories: "Category One" (highlighted), "Category Two", "Category Three", and "Category Four". Under "Category One", there are links for "Topic One", "Topic Two", and "Topic Three".
- Central Content Area:** Features a search bar labeled "Q Search For A Topic Or Entry!". Below it, a topic entry is shown: "User: Topic is do fish ever get thirsty?" with a heart icon and a "Report!" button. A second entry follows: "User: Entry is no, they don't" with a heart icon, "Expand", and "Report!" buttons. Below these are "+1" and "-1" buttons, followed by "Points: 10". A text prompt "Have something to add???" is above a large text input field, with an "Add" button below it.
- Right Sidebar:** Contains two lists. The top list, under tabs "H", "M", "N", "S", and "LO", is titled "Your Topic One", "Your Topic Two", and "Your Topic Three". The bottom list is titled "Favorite Topic One", "Favorite Topic Two", and "Favorite Topic Three".

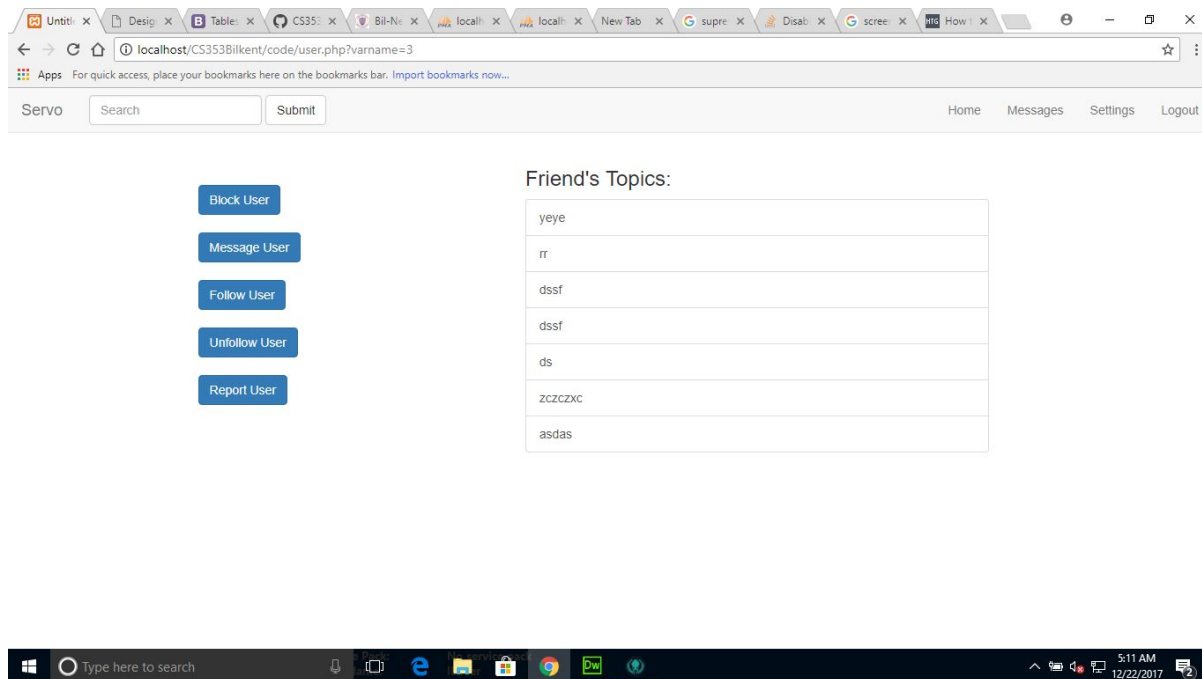
Messages Page

The message page allows our logged in users to chat with other users. On the left of the page, there will be names of users with whom the user can interacted with. This list excludes the name of users blocked by our user. The user can either open up a previous chat or go to the profile of another user to start a new chat with that user. To simply send a new message, user needs to write a message to the message field at the bottom, and click send message.



User Profile Page

This is the page that our user will land, when clicking on other users' names. The profile page includes the username of the clicked user along with the buttons to either Follow, Unfollow, Report, Message, or Block them. On the right side of the page, the topics posted by that user are also be displayed. Upon clicking on one of the topics, user will be directed to the Topic page of that specific page.



User Settings Page

This is the page for our user to control his/her account settings. From here they can change their password, email. They can also block other users, by typing their username, and clicking on the block button. Additionally they will see the list of users they have blocked, and they are following currently. From here they can select one of the users, and block or unfollow them accordingly by clicking on the relative button.

localhost/CS353Bilkent/code/settingsuser.php

Servo Search Submit Home Messages Settings Logout

New Password Change Password New Email Change Email

Username Block User Username Unblock User

Username Unfollow User

Your Block List:

mehmer
ali

Following:

You Are Not Following Anyone

Admin Settings Page

This settings page is only for admins, and will be only visible to users who are admins.

From this page, an Admin can:

- Change his personal password or email.
- Block other users from messaging or following him.
- Ban other users from using the site.
- Add a new category to the website.
- View reports submitted by other users.
- Look at the list of users, he is following, and be able to unfollow any of them.
- Look at the list of users which are banned from the website and be able to unban any of them.
- View all of the users blocked by the admin and be able to unblock any of them.

The screenshot shows a web browser window with the URL `localhost/CS353Bilkent/code/settingsadmin.php`. The page has a navigation bar with links for Home, Messages, Settings, and Logout. The main content area is divided into two columns. The left column contains forms for 'Change Password', 'Block User', 'Unblock User', 'Add Category', and 'Remove Report'. The right column contains forms for 'Change Email', 'Ban User', 'Unban User', 'Remove Category', and 'Unfollow'. Below these forms, there are two sections: 'Your Block List' and 'System Ban List'. The 'Your Block List' section shows a list of users: 'mehmer' and 'ali'. The 'System Ban List' section shows a message: 'No Users Have Been Banned From The Site'. At the bottom, there are two sections: 'Reports' and 'Following'. The 'Reports' section shows a list of reports, and the 'Following' section shows a message: 'You Are Not Following Anyone'.

Servo Search Submit Home Messages Settings Logout

New Password Change Password New Email Change Email

Username Block User Username Ban User

Username Unblock User Username Unban User

Category Name Add Category Category Name Remove Category

Report ID Remove Report Username Unfollow

Your Block List:

mehmer

ali

System Ban List:

No Users Have Been Banned From The Site

Reports:

Following:

You Are Not Following Anyone