Database Management System Project: Realtime Document Collaborator

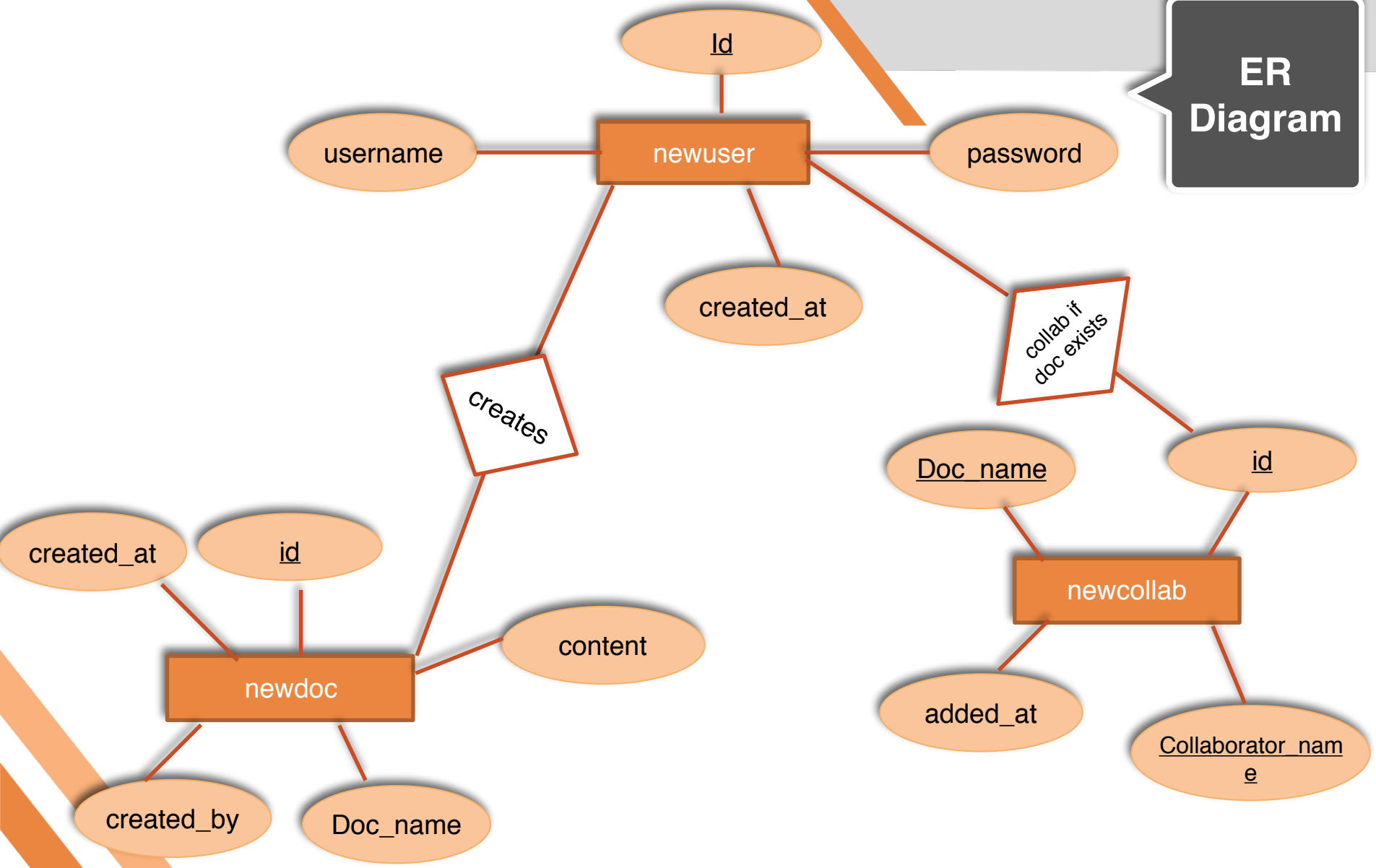
Introduction & Central Idea-

- The project we have created focuses on resolving a practical problem, rather than a hypothetical one. We decided not to address a obsolesce or a common issue which has been taken care of in numerous ways, instead we preferred to go for something new.
- We as students have to collaborate on many different occasions to complete a task. These tasks many a times require us to share our portion of the task with each other and hence work accordingly, as a team. ‘CollabX’ allows all the team members to work simultaneously in a coordinated manner, as if they are present next to eachother physically. At this platform all authorized team members can view the progress of work done by other members and co-ordinate effectively to increase productivity.

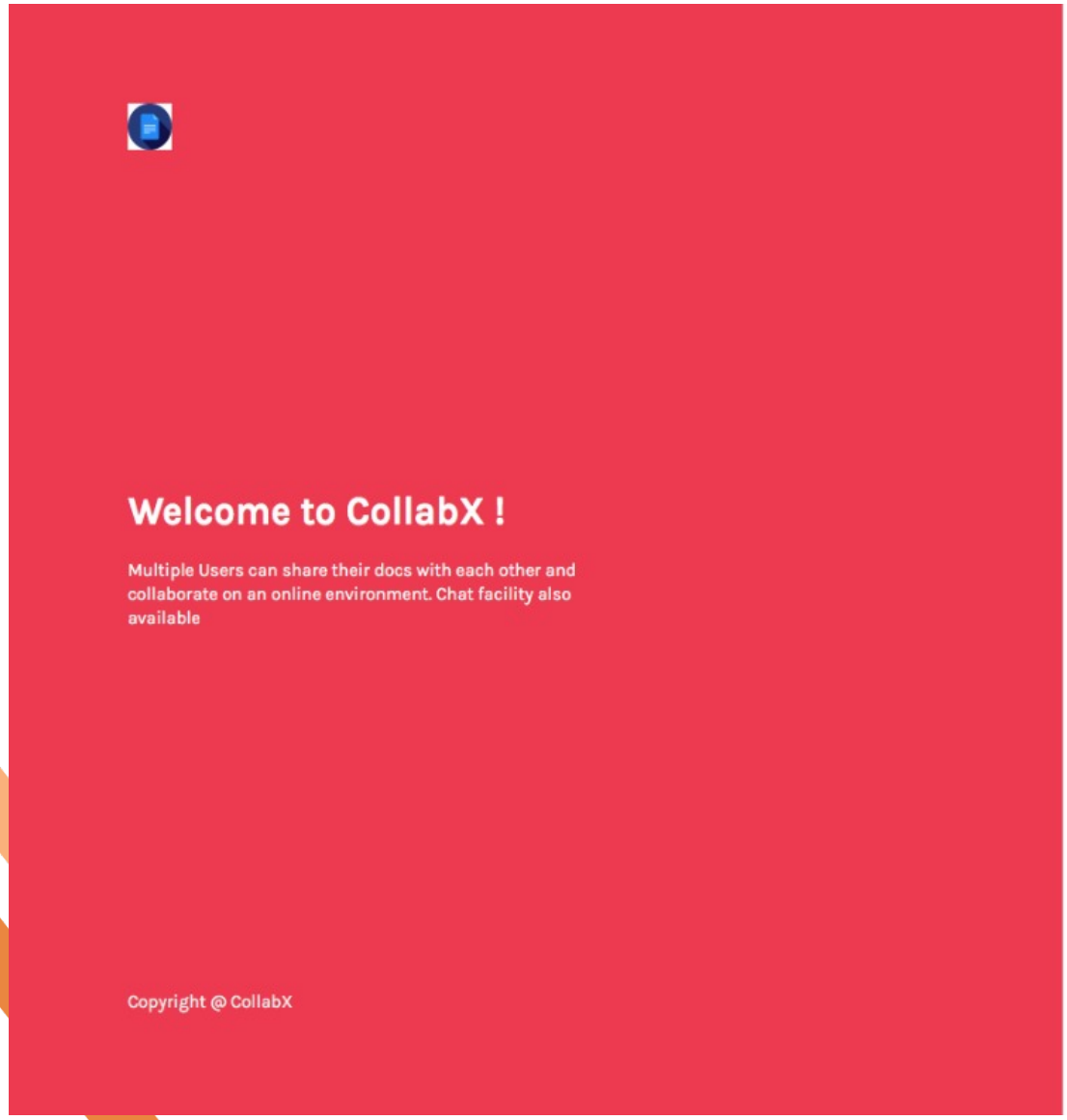
Execution

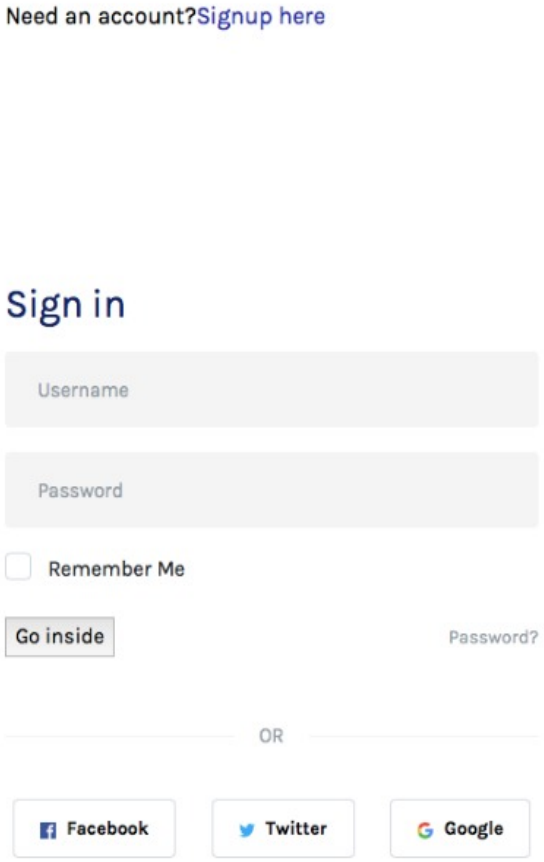
- The project had to work on both the ends: front and back. The front end would provide a simple user interface for the functionalities. The back end would comprise of the actual database and all the user data stored.
- The data is stored in a cloud server, allowing remote accessibility to all authorized team members, on any platform. We plan to make the project platform technology agnostic hence it would be hosted on a cloud server. The relevant code is written in SQL.

ER Diagram

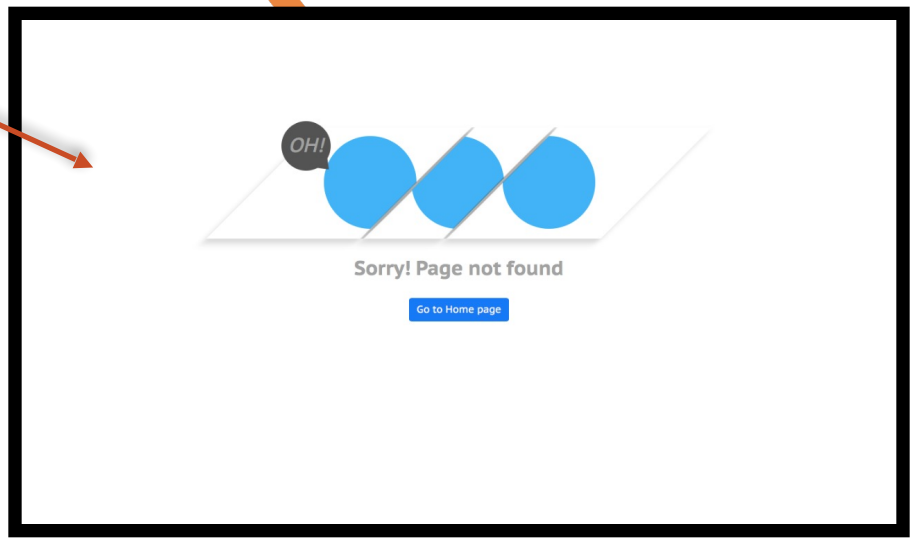

Id
username
newuser
password
created_at
collab if doc exists
creates
Doc_name
id
created_at
id
newcollab
content
newdoc
added_at
Collaborator_name
created_by
Doc_name

Front End

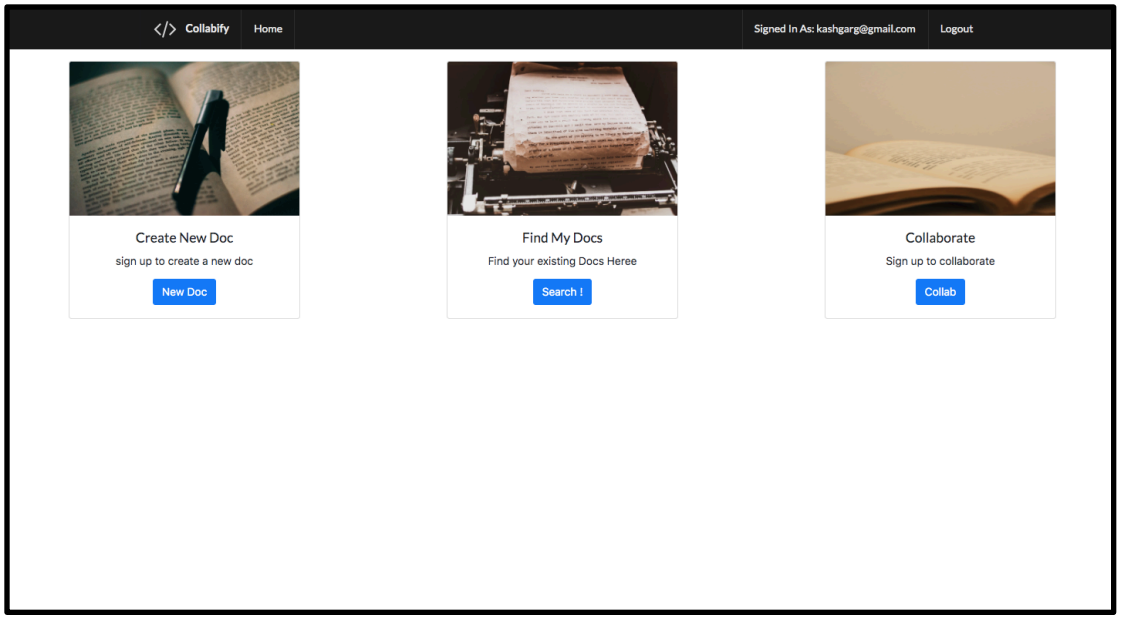

Welcome to CollabX !
Multiple Users can share their docs with each other and collaborate on an online environment. Chat facility also available
Copyright @ CollabX


Need an account?Signup here
Sign in
Username
Password
Remember Me
Go inside
Password?
OR
Facebook
Twitter
Google

If Wrong credentials are provided then the users is directed to the error page



If the User exist in our database then user is directed into the website introductory page



The Site

- This is the first page encountered upon opening the site. The valid login credentials maybe entered to login, otherwise new users can signup.
- In the following slides one can see the home page or dashboard. Here are the 3 major functionalities listed in the page.
  1. ‘Create New Doc’
  2. ‘Go to a document’
  3. ‘Collaborate’

Home Page

Create a New Doc

- Upon selecting this option, the user is prompted to enter the name and project of the document.
- The user when authorized can then type in the newly created document.

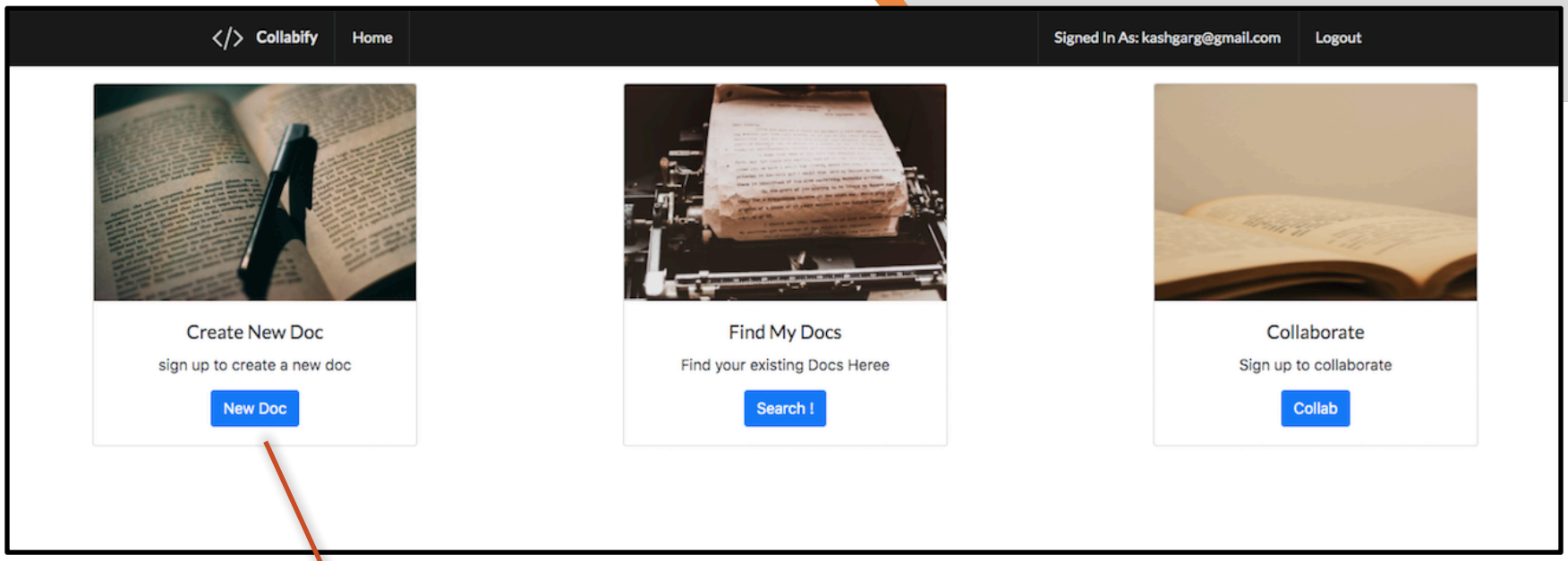
Go to a Document

•For an existing user this allows one to access an already existing document. The user can enter the required details to navigate to the document.

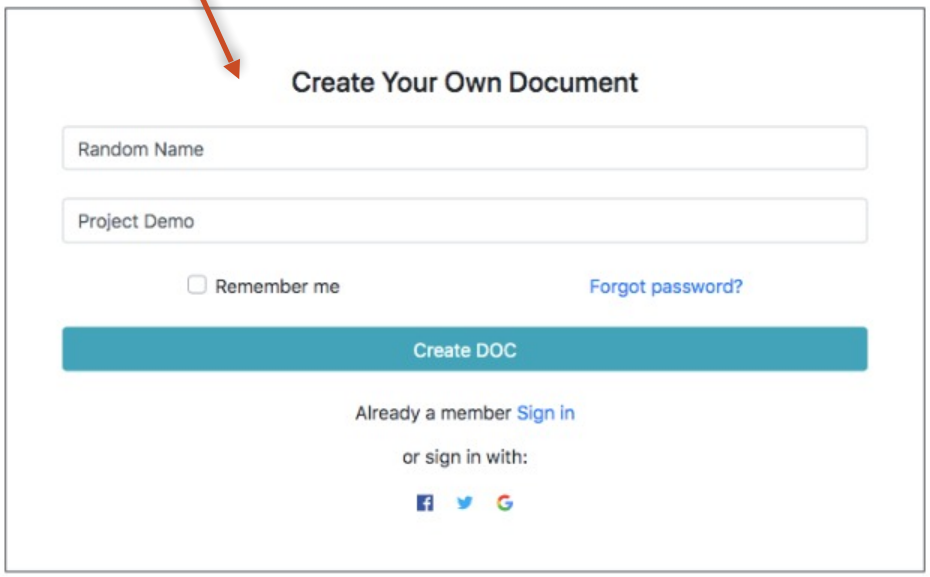
•The window then shows the list of documents created and collaborated by the logged in user.

Collaborate

- The user enters the exact document name for collaboration. If the document exists then the user is added to the list of collaborators. He can now view and work with the document.

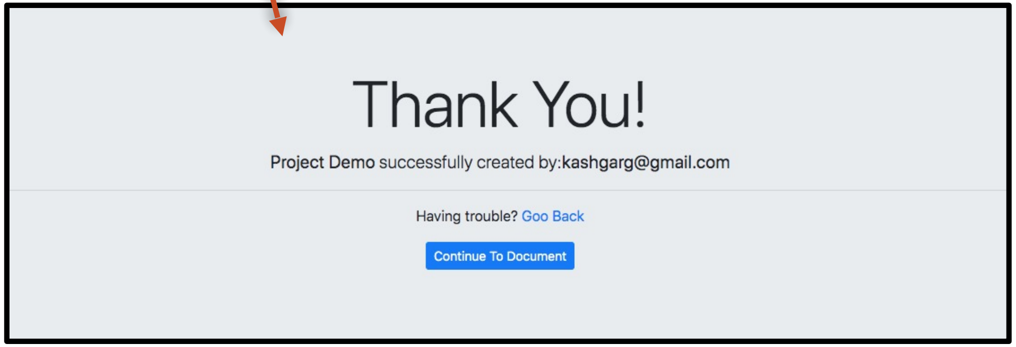


Home Page

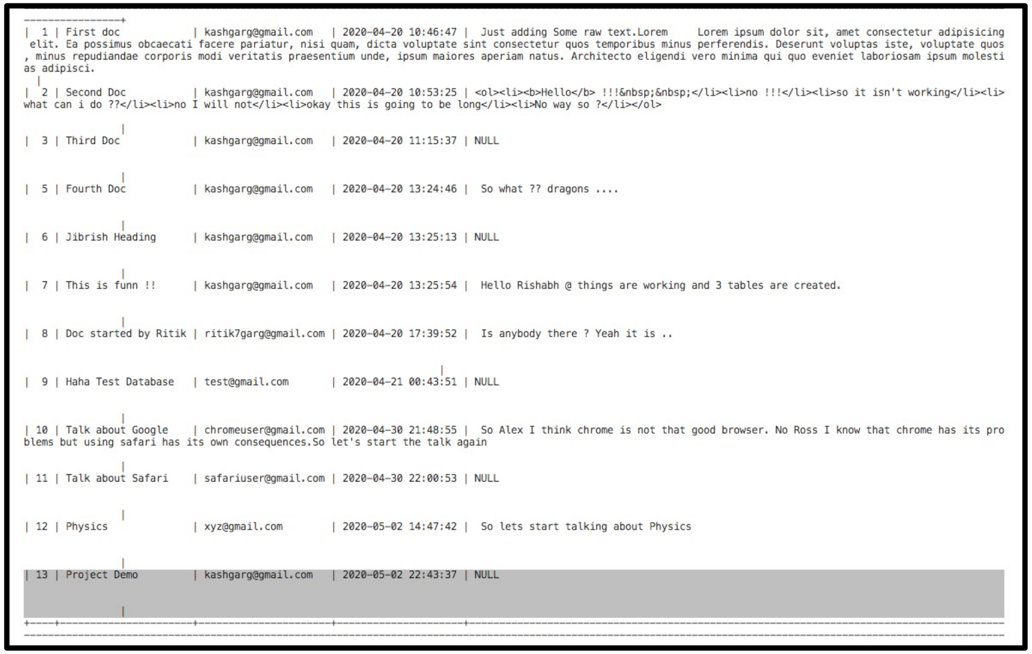


Create New Doc page

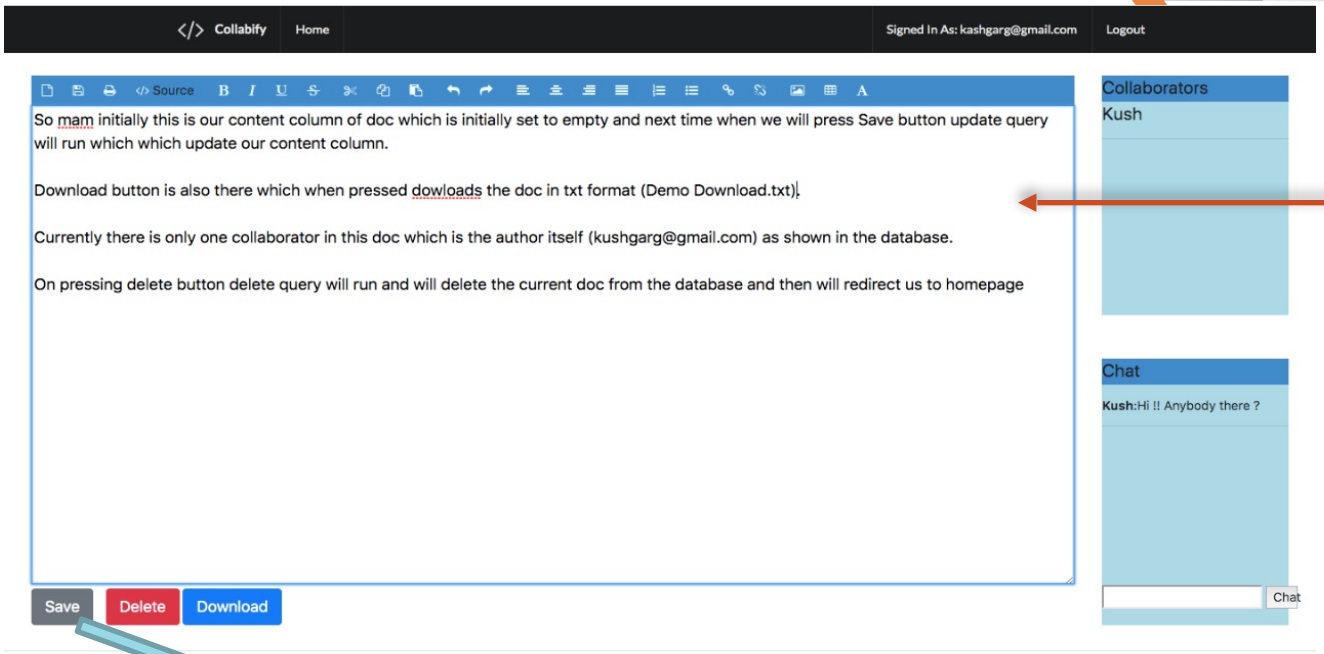
After creating a document successfully it will be added to the database and we will be redirected to a thank you page.



Initially the content of doc Project Demo is set to null which can be seen from the sql table.

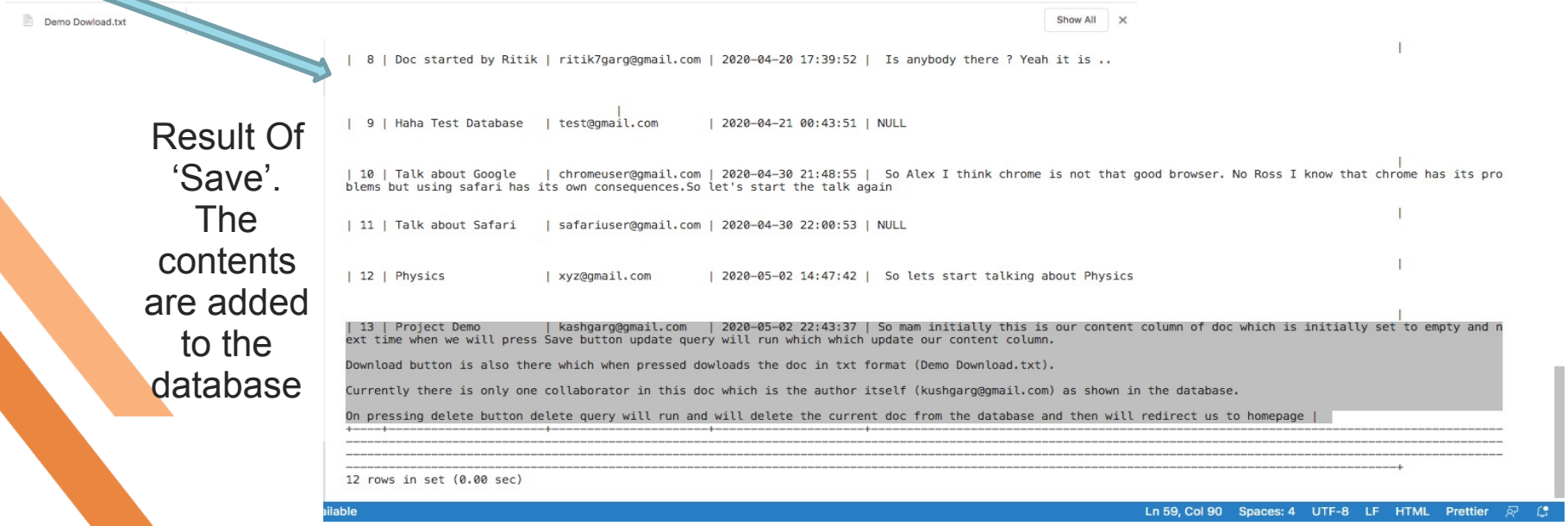


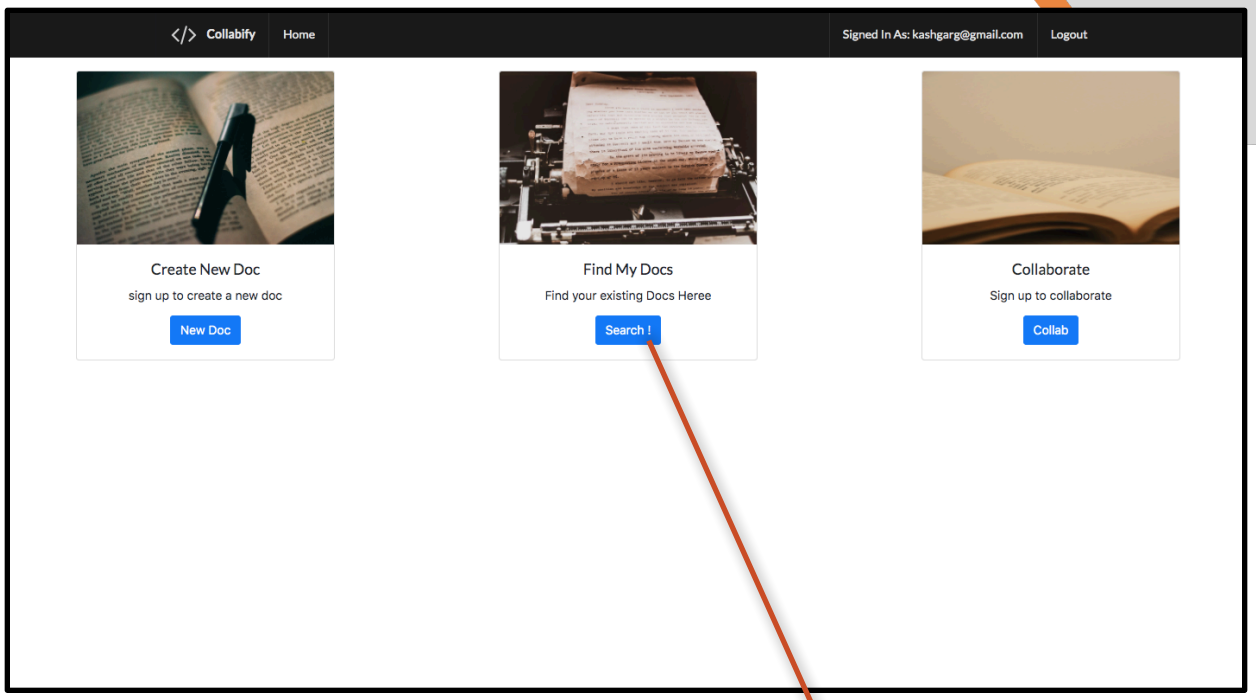
1	First doc	kashgarg@gmail.com	2020-04-20 10:46:47	Just adding Some raw text.Lorem Lorem ipsum dolor sit, amet consectetur adipisicing elit. Ea possimus obcaecati facere pariatur, nisi quam, dicta voluptate sint consectetur quos temporibus minus perferendis. Deserunt voluptas iste, voluptate quos , minus repudiandae corporis modi veritatis praesentium unde, ipsum maiores aperiam natus. Architecto eligendi vero minima qui quo eveniet laboriosam ipsum molestias adipisci.
2	Second Doc	kashgarg@gmail.com	2020-04-20 10:53:25	- Hello !!! - no !!! - so it isn't working - what can i do ?? - no I will not - okay this is going to be long - No way so ?
3	Third Doc	kashgarg@gmail.com	2020-04-20 11:15:37	NULL
5	Fourth Doc	kashgarg@gmail.com	2020-04-20 13:24:46	So what ?? dragons ....
6	Jibrish Heading	kashgarg@gmail.com	2020-04-20 13:25:13	NULL
7	This is funn !!	kashgarg@gmail.com	2020-04-20 13:25:54	Hello Rishabh @ things are working and 3 tables are created.
8	Doc started by Ritik	ritik7garg@gmail.com	2020-04-20 17:39:52	Is anybody there ? Yeah it is ..
9	Haha Test Database	test@gmail.com	2020-04-21 00:43:51	NULL
10	Talk about Google	chromeuser@gmail.com	2020-04-30 21:48:55	So Alex I think chrome is not that good browser. No Ross I know that chrome has its problems but using safari has its own consequences.So let's start the talk again
11	Talk about Safari	safariuser@gmail.com	2020-04-30 22:00:53	NULL
12	Physics	xyz@gmail.com	2020-05-02 14:47:42	So lets start talking about Physics
13	Project Demo	kashgarg@gmail.com	2020-05-02 22:43:37	NULL



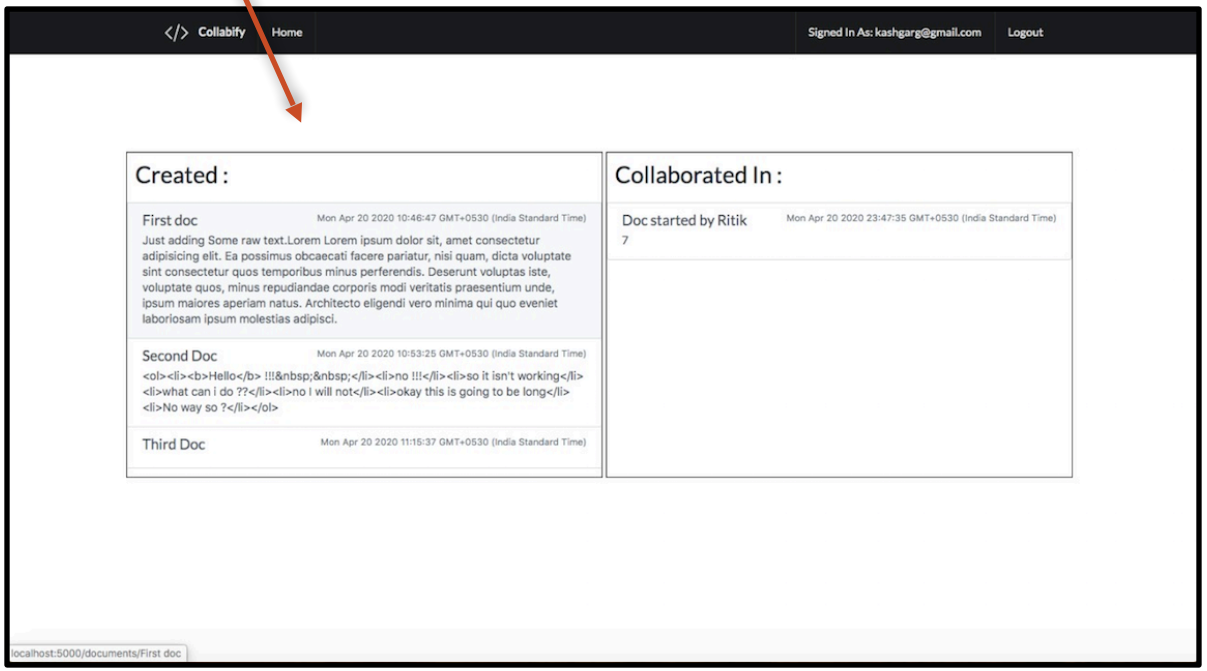
If the user enters the doc and writes some content and update query is used to enter data in content column which was initially set to null.

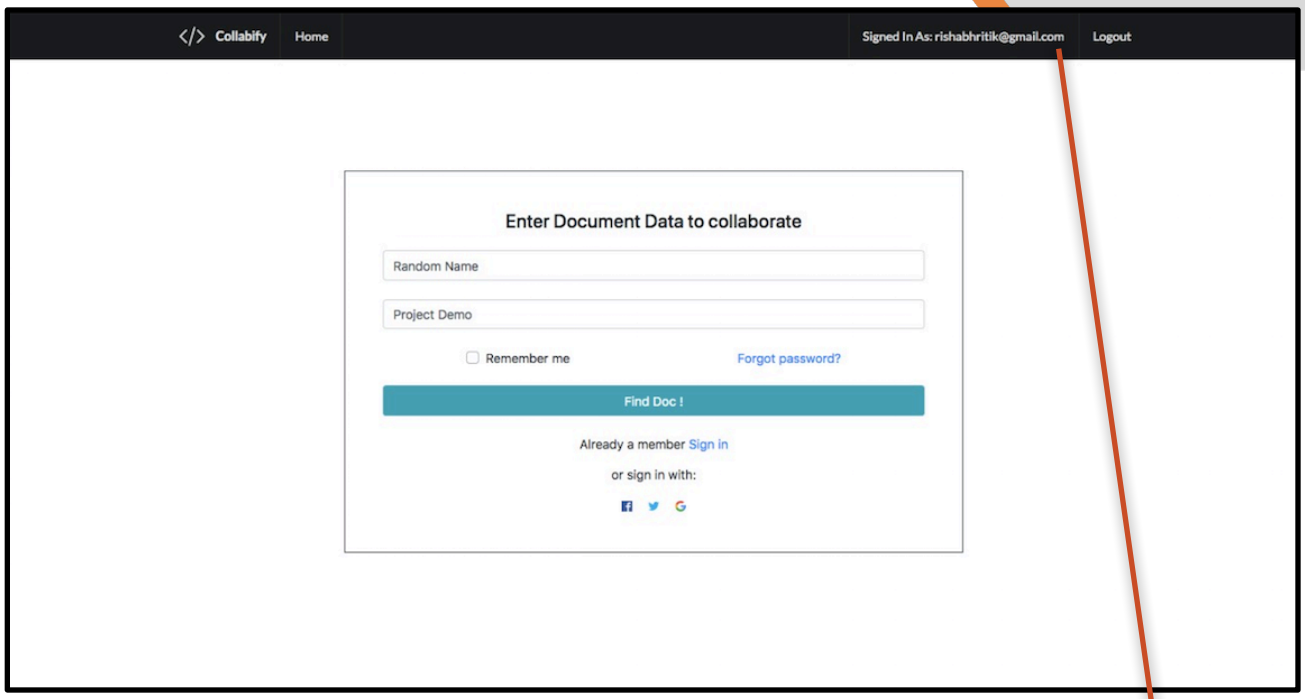
Result Of 'Save'. The contents are added to the database



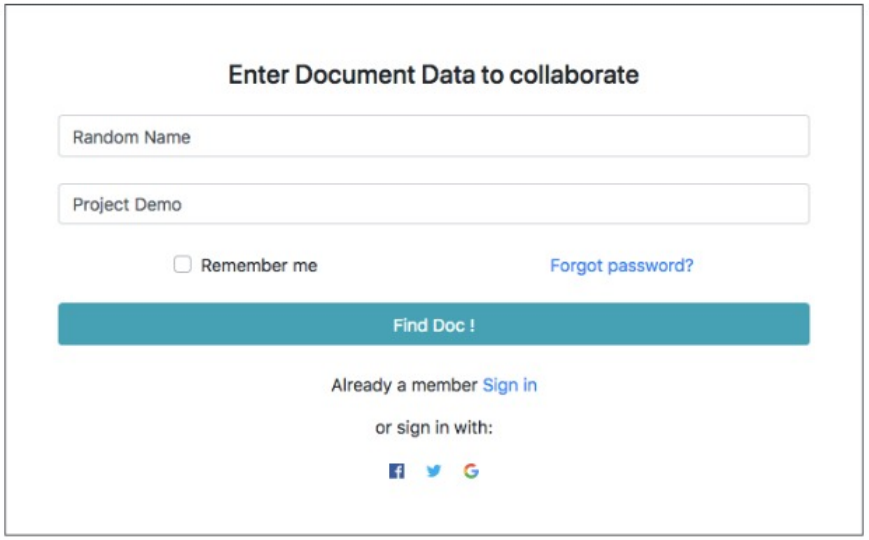


The list of documents created and collaborated by the logged in user.

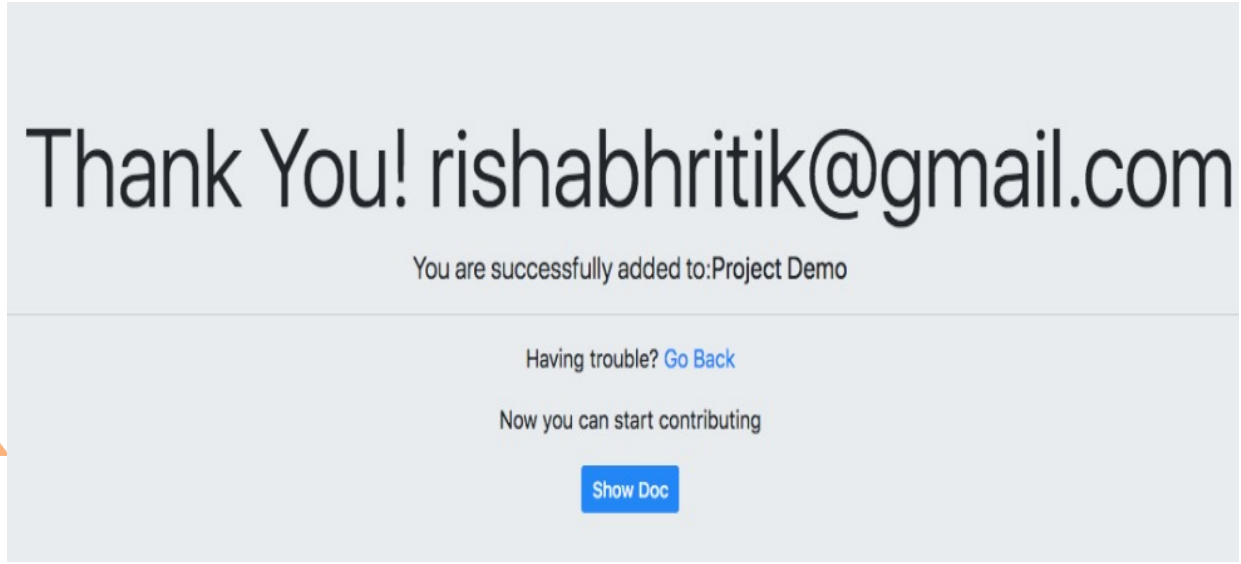




Now other user has logged in so this user will now collaborate in the doc Project Demo



The user enters the credentials for Collaboration



If the credentials are correct, then the user is added to the collaborators.

Salient Points in the Front end

1. The interface provided for writing a document is very much similar to the Microsoft Word application, thus making it user friendly and easy to use.
2. A side bar allows the collaborators to chat in real time during the session. One can view the existing list of collaborators for the present document.
3. ‘Save’, ‘Delete’ & ‘Download’ options are included in the document interface to allow the user to perform these options conveniently.
4. It takes care of data sanctity and security as only the authorized users are allowed to access and manipulate the documents.
5. A ‘Remember me’ check box is also added to see that the user does not have to enter the credentials every time he visits the site.

Back End

- The entire data is stored within 3 tables:
  1. Newuser- stores data concerning the users who are registered with the site. The details from the ‘Sign up ’ page is reflected here.
  2. Newdoc- stores data mainly the contents of document. The details regarding the document is stored in this table.
  3. Newcollab- stores data about the collaborators of a document.
- Every time the user modifies or creates a document, using the relevant commands of SQL, these changes are reflected in database.

The 3 Tables

newuser

- The table contains 4 columns: ‘id’, ‘username’, ‘password’, ‘created_at’.
- The username and password columns ensure security. The id field acts as the primary key. While the created_at column helps to identify an additional detail about the document.

newdoc

- The table contains 5 columns: ‘id’, ‘doc_name’, ‘created_by’, ‘created_at’, ’content’.
- The id column acts as the primary key for table. The content field contains all the contents of a document. The other 3 columns are for reference to the documents.

newcollab

- The table contains 4 columns: ‘id’, ‘doc_name’, ’collaboratoe_name’, ‘added_at’.
- For this table the first three columns act as a primary composite key. The table is crucial as it enables us to cross-reference with the ‘newdoc’ table, for allowing a user to collaborate.

```
mysql> select * from newuser;
+----+----------------------+----------------+---------------------+
| id | Username             | password       | created_at          |
+----+----------------------+----------------+---------------------+
|  1 | ritik7garg@gmail.com | noneofbusiness | 2020-03-26 19:37:44 |
|  2 | kashgarg@gmail.com   | wpa21234       | 2020-03-26 19:37:48 |
|  3 | rohit@gmail.com      | rohit123       | 2020-03-26 21:03:31 |
|  4 | iitian@gmail.com     | iitiansachin   | 2020-03-26 21:03:59 |
|  5 | test@gmail.com       | test123        | 2020-03-26 21:14:24 |
|  6 | test2@yahoo.com      | test12345      | 2020-03-26 23:11:21 |
|  7 | rishabh@gmail.com    | rishabh123     | 2020-03-27 01:31:57 |
|  8 | rohan@gmail.com      | rohan          | 2020-04-12 14:51:59 |
|  9 | chromeuser@gmail.com | chrome         | 2020-04-30 21:46:13 |
| 10 | safariuser@gmail.com | safari         | 2020-04-30 21:46:33 |
| 11 | xyz@gmail.com        | xyz            | 2020-05-02 14:44:39 |
+----+----------------------+----------------+---------------------+
11 rows in set (0.00 sec)
```

The newuser table

```
mysql> select * from newcollab;
+----+---------------------+---------------------+---------------------+
| id | Doc_name            | collaborator_name   | added_at            |
+----+---------------------+---------------------+---------------------+
|  4 | Third Doc           | ritik7garg@gmail.com | 2020-04-20 17:25:56 |
|  5 | Third Doc           | ritik7garg@gmail.com | 2020-04-20 17:32:15 |
|  7 | Doc started by Ritik | kashgarg@gmail.com  | 2020-04-20 23:47:35 |
|  8 | Doc started by Ritik | test@gmail.com      | 2020-04-21 00:44:34 |
|  9 | Talk about Google   | safariuser@gmail.com | 2020-04-30 21:59:57 |
| 10 | Second Doc          | ritik7garg@gmail.com | 2020-05-01 14:46:57 |
| 11 | Project Demo        | rishabhritik@gmail.com | 2020-05-02 23:17:01 |
+----+---------------------+---------------------+---------------------+
7 rows in set (0.00 sec)
```

The newcollab table

```
|  8 | Doc started by Ritik | ritik7garg@gmail.com | 2020-04-20 17:39:52 |  Is anybody there ? Yeah it is ..                                         |

|  9 | Haha Test Database   | test@gmail.com       | 2020-04-21 00:43:51 | NULL

| 10 | Talk about Google    | chromeuser@gmail.com | 2020-04-30 21:48:55 |  So Alex I think chrome is not that good browser. No Ross I know that chrome has its pro
blems but using safari has its own consequences.So let's start the talk again

| 11 | Talk about Safari    | safariuser@gmail.com | 2020-04-30 22:00:53 | NULL                                                                            |

| 12 | Physics              | xyz@gmail.com        | 2020-05-02 14:47:42 |  So lets start talking about Physics                                      |

| 13 | Project Demo         | kashgarg@gmail.com   | 2020-05-02 22:43:37 | So mam initially this is our content column of doc which is initially set to empty and n
ext time when we will press Save button update query will run which which update our content column.

Download button is also there which when pressed dowloads the doc in txt format (Demo Download.txt).

Currently there is only one collaborator in this doc which is the author itself (kushgarg@gmail.com) as shown in the database.

On pressing delete button delete query will run and will delete the current doc from the database and then will redirect us to homepage |
+----+----------------------+----------------------+---------------------+----------------------------------------------------------------------------------

12 rows in set (0.00 sec)
ilable                                                    Ln 59, Col 90   Spaces: 4   UTF-8   LF   HTML   Prettier
```

The newdoc table

Concepts Used

1. Various Data Definition language commands like ‘create’, ‘alter’ were used.
2. Data Manipulation Language commands comprising of ‘insert’ ,’update’, ‘delete’ were used for creating records. Initially the ‘content’ column of ‘newdoc’ table is set to null, but as the content is saved, the update command is used to add the content to the record. The ‘insert into’ command was used to create records.Concept of Foreign and Primary keys are also used.
3. Data Query language command ‘Select’ was used for all queries. Nested queries with ‘where’ clause were also used to produce refined results.
4. In various columns of the tables auto increment and time stamp feature of SQL was used.
5. Check and other constraints were applied in the project, especially in designing the login pages.

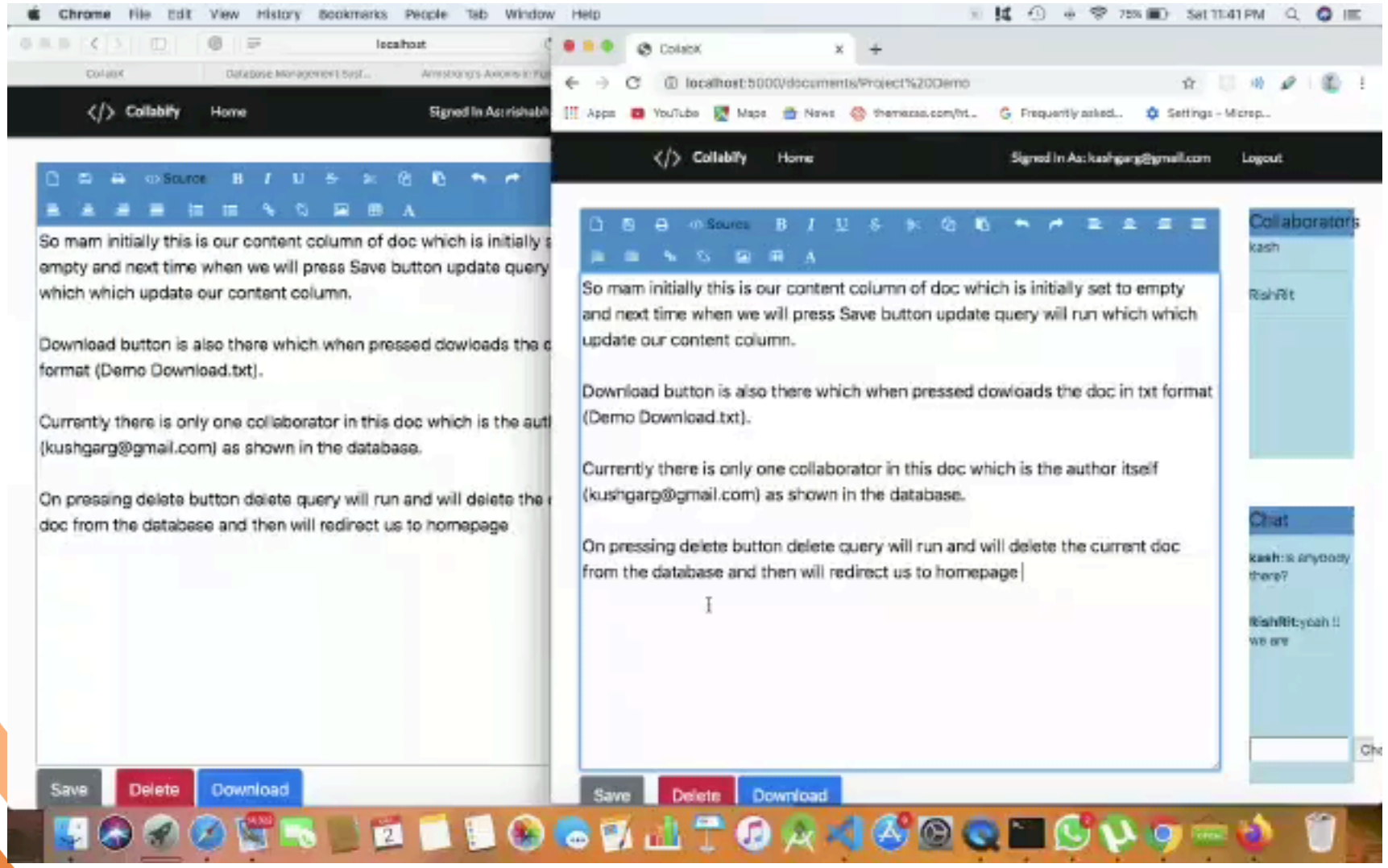
Web Technologies used :-

- Nodejs ,javascript, html, css, express,ejs,bootstrap etc for front-end part.
- Socket IO (JavaScript library for realtime web applications).
- Mysql for back-end part

Further improvement which can be done to make it a complete end product-

- Passwords in the newuser table can be converted into hash like popular hashing algorithms like SHA-256 , MD5 etc to maintain user privacy.
- Rather than database hosted on a local machine it should be deployed onto a cloud server so that users located far off from each other can contribute and save their docs on the cloud.

A virtual tour



Thank You !!!