04 DECEMBER 2017

FINAL PROJECT REPORT

CSE DASHBOARD

TEAM COSMICSOFT

TEXAS A&M UNIVERSITY
CSCE 606 – SOFTWARE ENGINEERING

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SUMMARY

We developed this portal because communication between most of the student organizations and the students are one dimensional; in the sense that one cannot directly interact with the other except through notice boards. The portal allows the student to post a query and an administrator or a student body to post information regarding relevant events. This would provide a common interface for students and Admins to communicate in real time and for these interactions to be viewed by other users who may be facing similar queries. This allows for transparency, we have made an easy to use UI which is intuitive and makes it easy to use the portal even as it grows to many more users. We created this product on Ruby on Rails, Heroku, GitHub, and also including Cucumber, Pivotal Tracker. The final product was demonstrated to and approved by the client.

INTRODUCTION

Our client is Pulakesh Upadhyaya, he represents the CSEGSA (Computer Science and Engineering Graduate Student Association). His requirement was an online portal to connect the admins of various organizations with the students in a more effective way. One of the major issues is the large number of emails that are sent to every student, this portal would serve as a common location for relevant information being spread by the users and admins to the students of the CSE department. The product is now complete and have the following features; students can post queries, administrators can post events, students and administrators can stay in constant interaction through comments. Additional features requested by the client, like posting anonymously and tagging an administrator make the product more usable especially as the number of posts and users grow. The product is currently hosted on Heroku and is ready for hand over, equipped with a super user to even extend the number of admins in the future. We have managed to fully satisfy every requirement the client had in mind for the basic functionality of the product to make it usable and scalable.

STAKEHOLDERS

Client: Pulakesh Upadhyaya, CSEGSA at Texas A&M University.

Advising Faculty: Dr. Jeff Huang

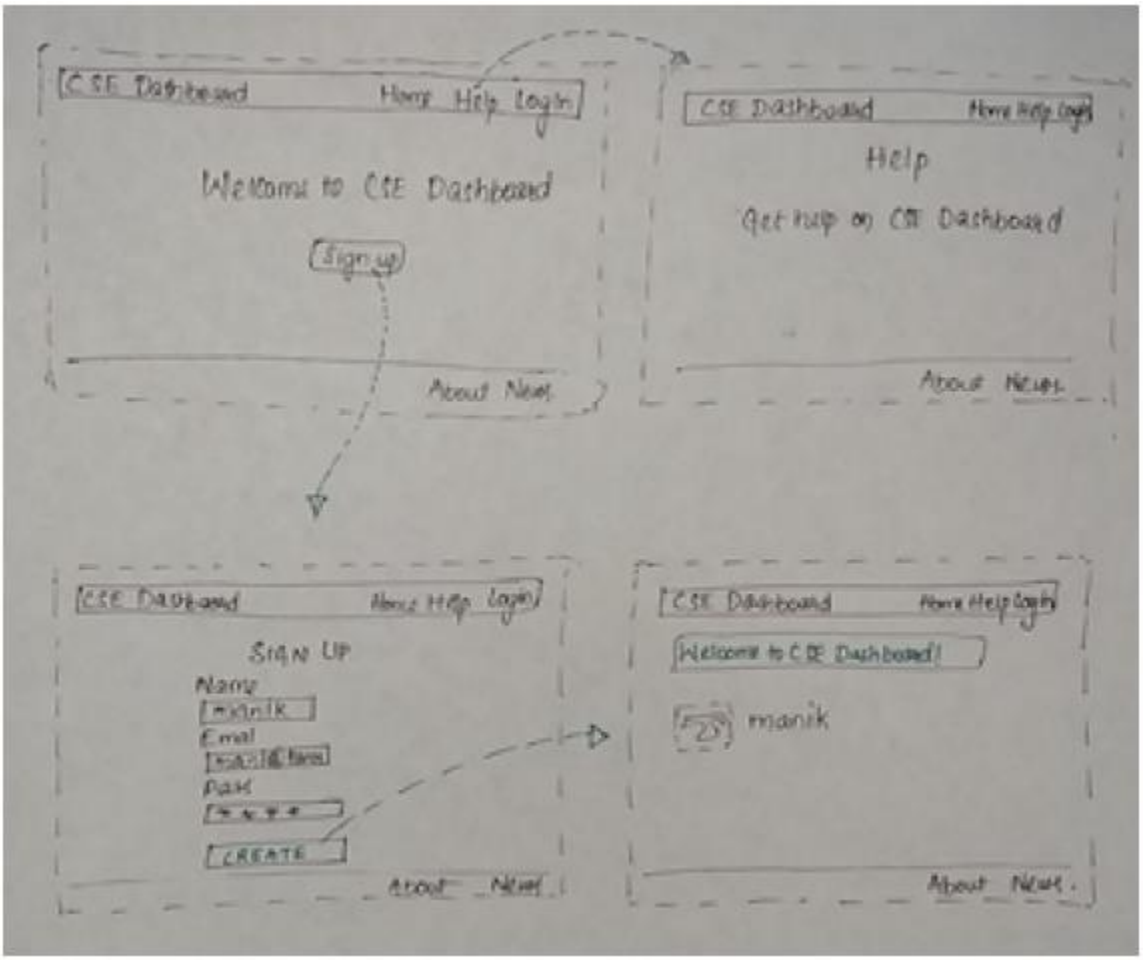
Team Members: Kevin Thomas Mathew, Sandeep Gottimukkala, Satya Kesav, Pranoy Kovuri, Krit Gupta

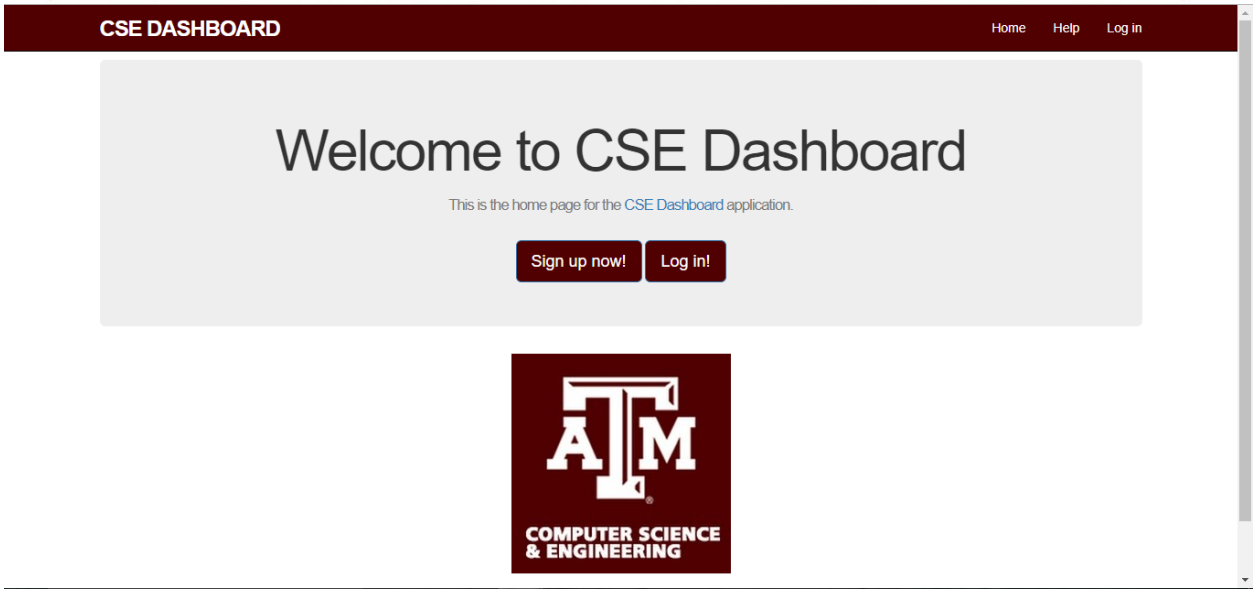
Admins: Representatives of various student bodies in CSE department at TAMU

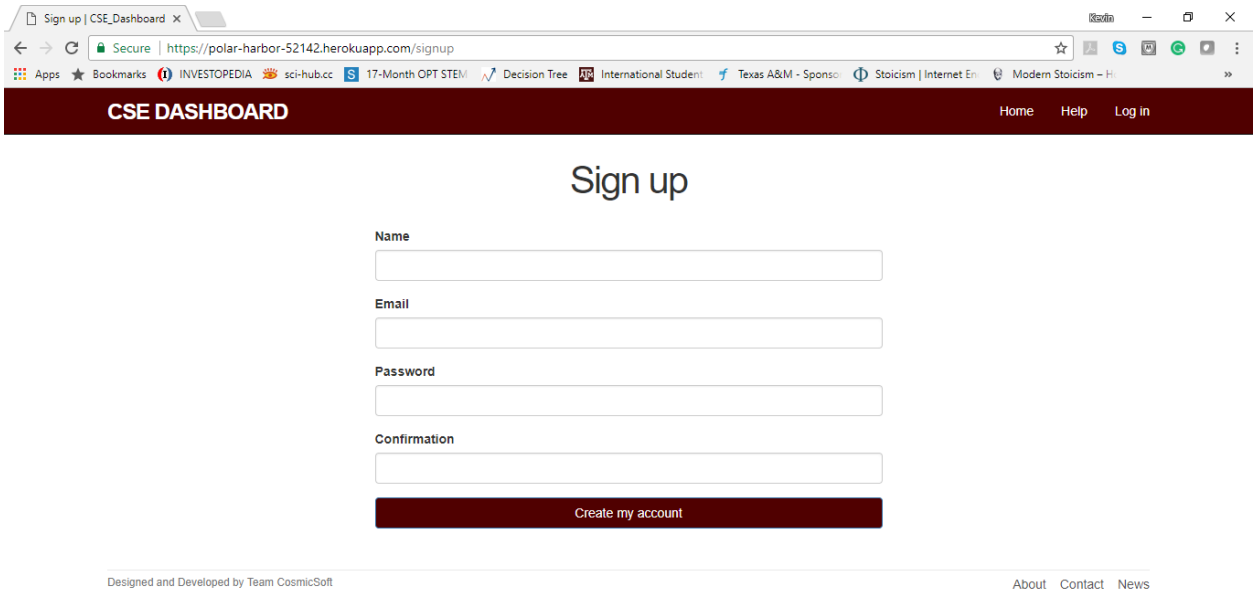
Users: Students who are in the CSE department at TAMU

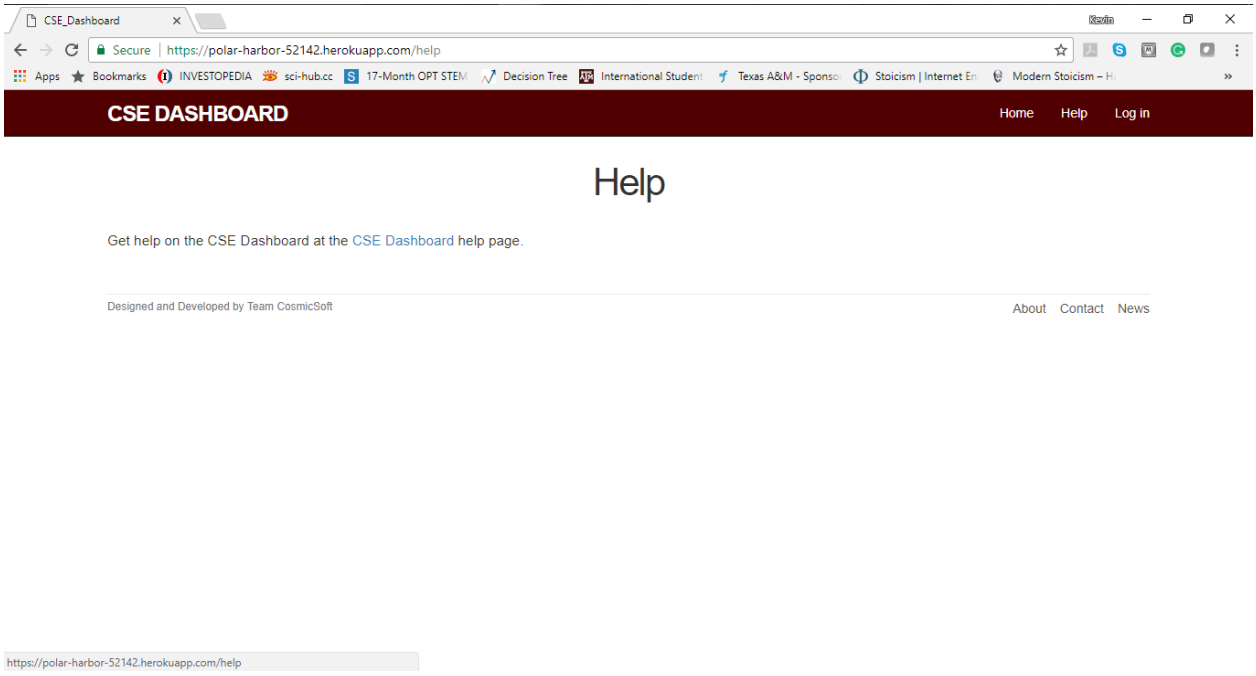
LO-FI MOCKUPS AND SCREENSHOTS

Landing Page and Static Pages









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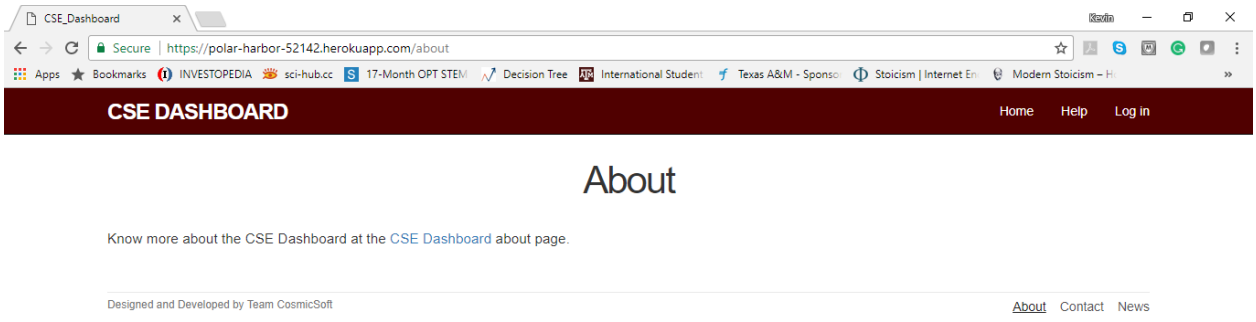

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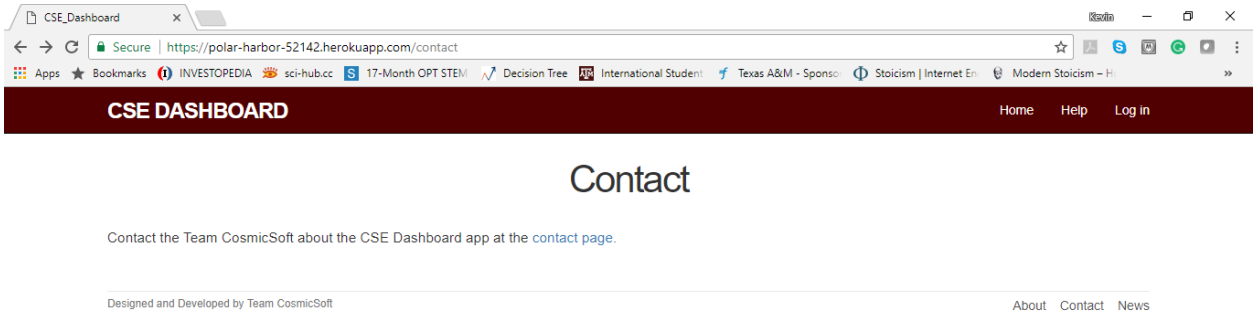
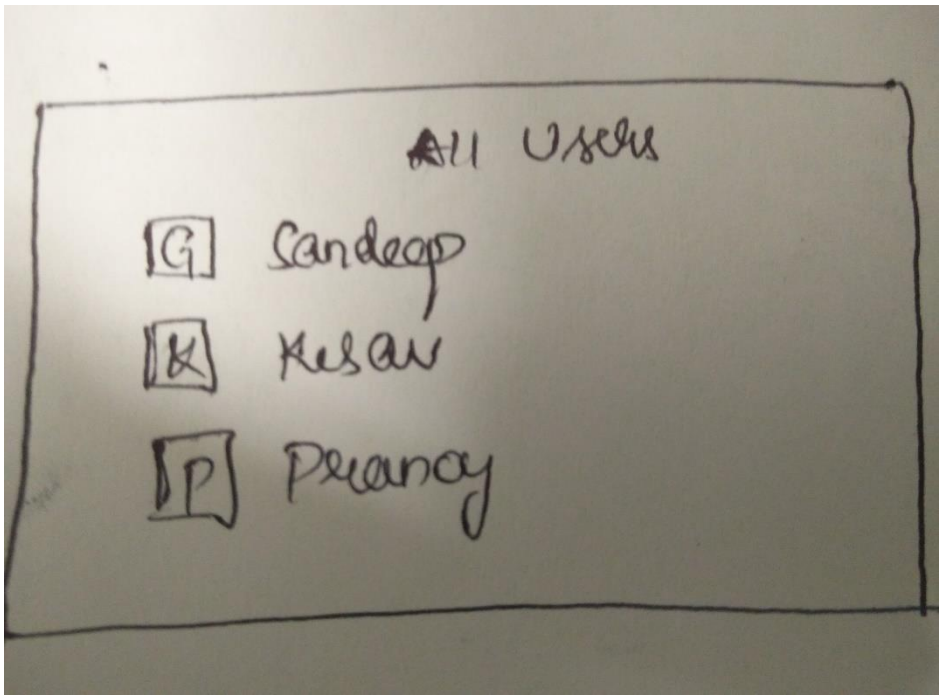
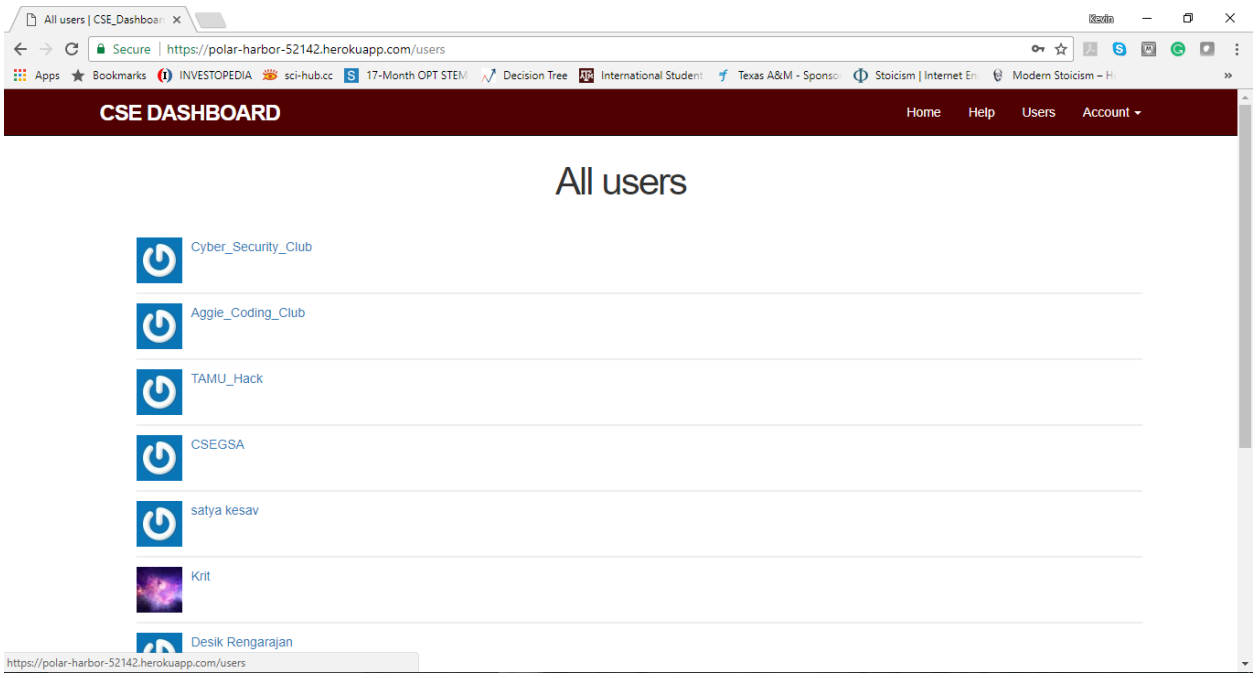


All Users


All Users
G Sandeep
K Kesav
P Pranay


All users | CSE_Dashboard
Secure | https://polar-harbor-52142.herokuapp.com/users
CSE DASHBOARD
Home
Help
Users
Account
All users
Cyber_Security_Club
Aggie_Coding_Club
TAMU_Hack
CSEGSA
satya kesav
Krit
Desik Rengarajan
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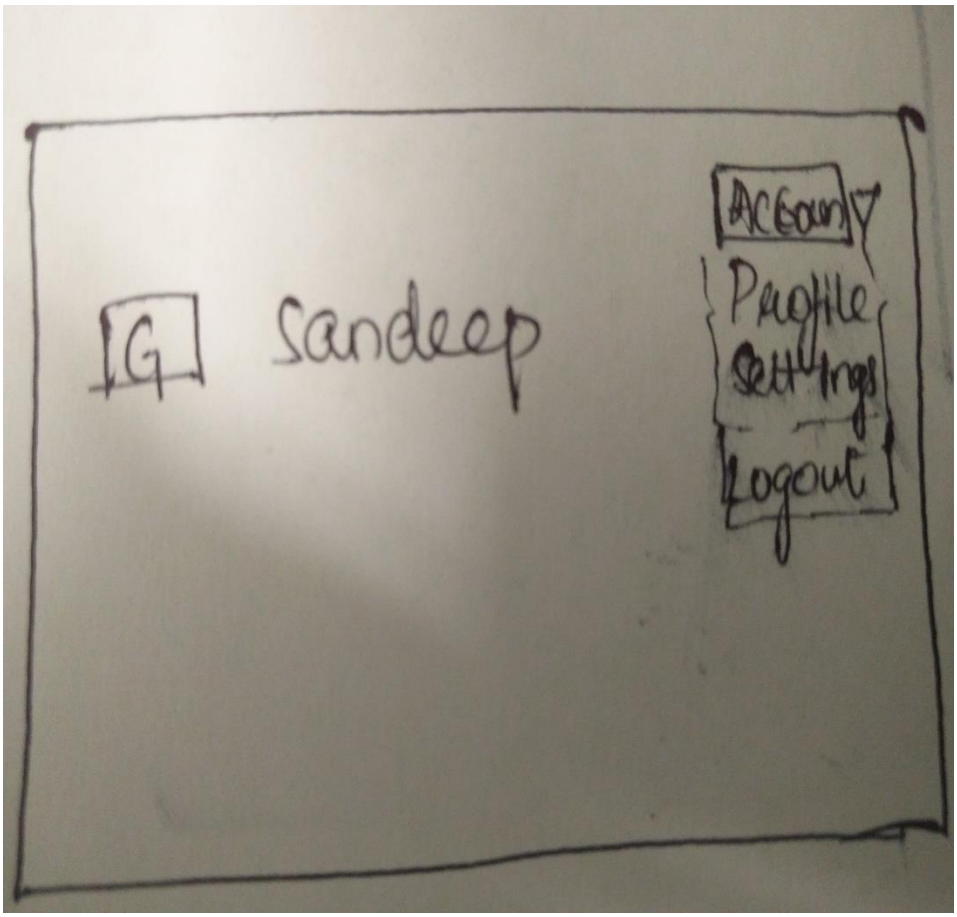
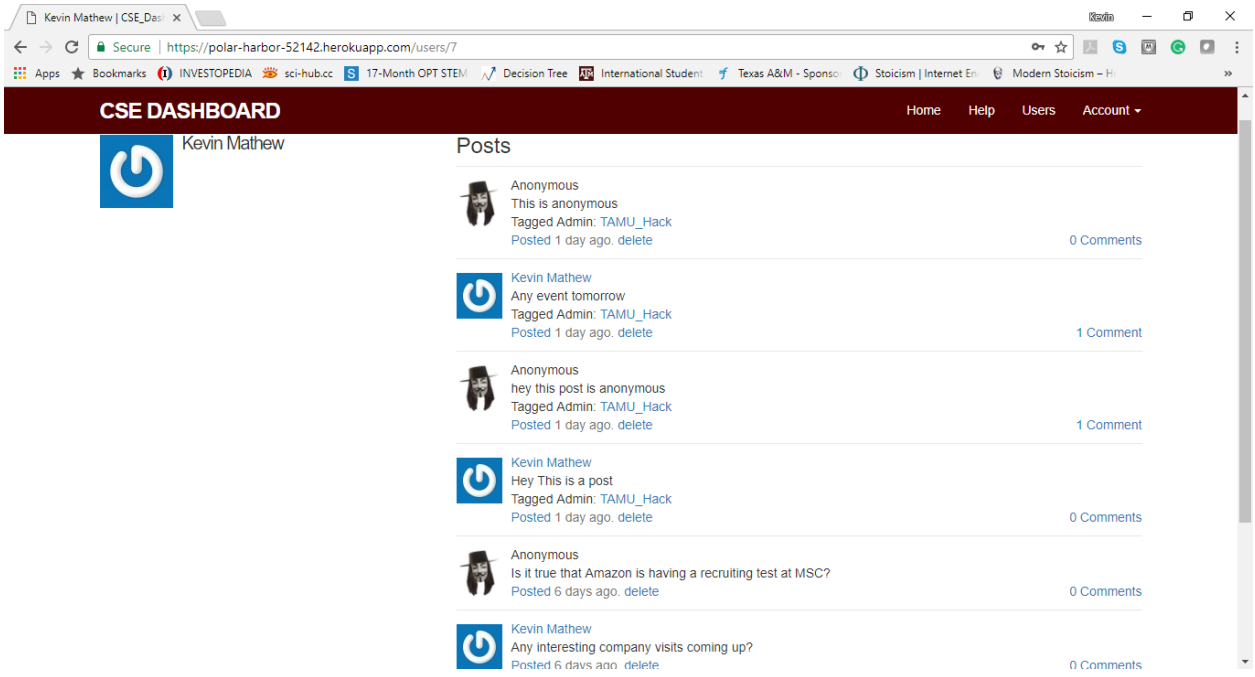
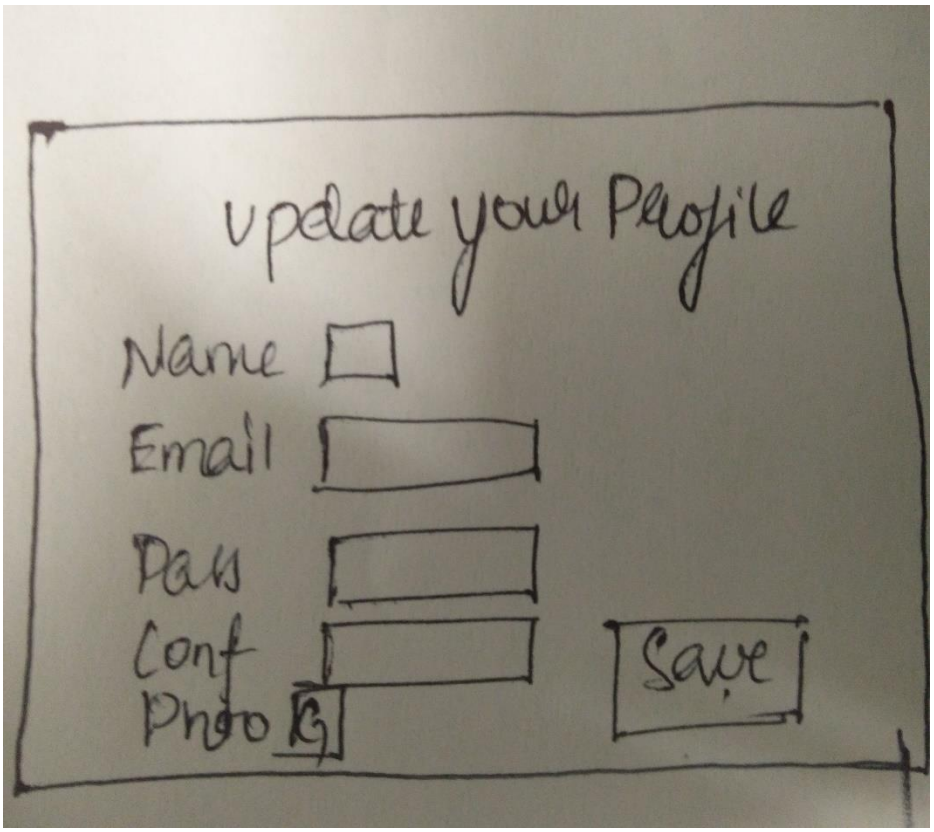
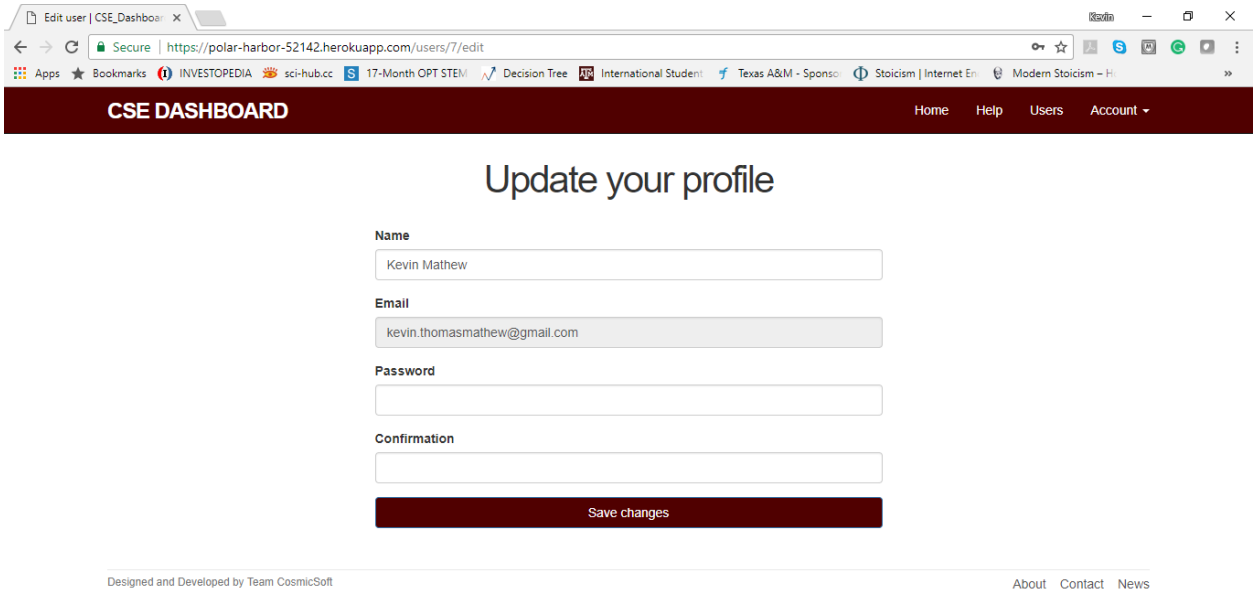
User Profile



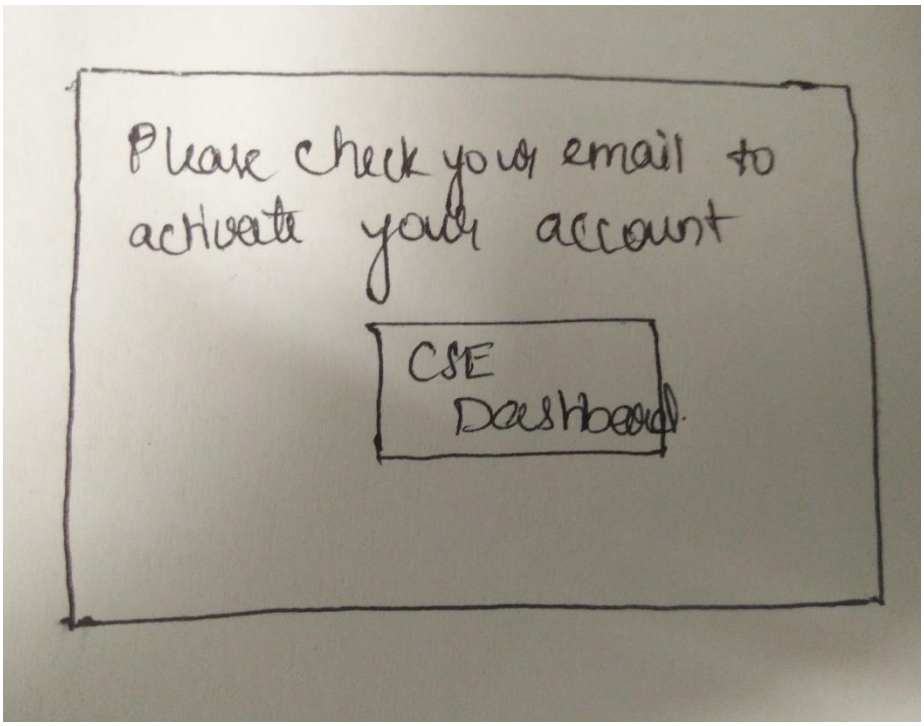


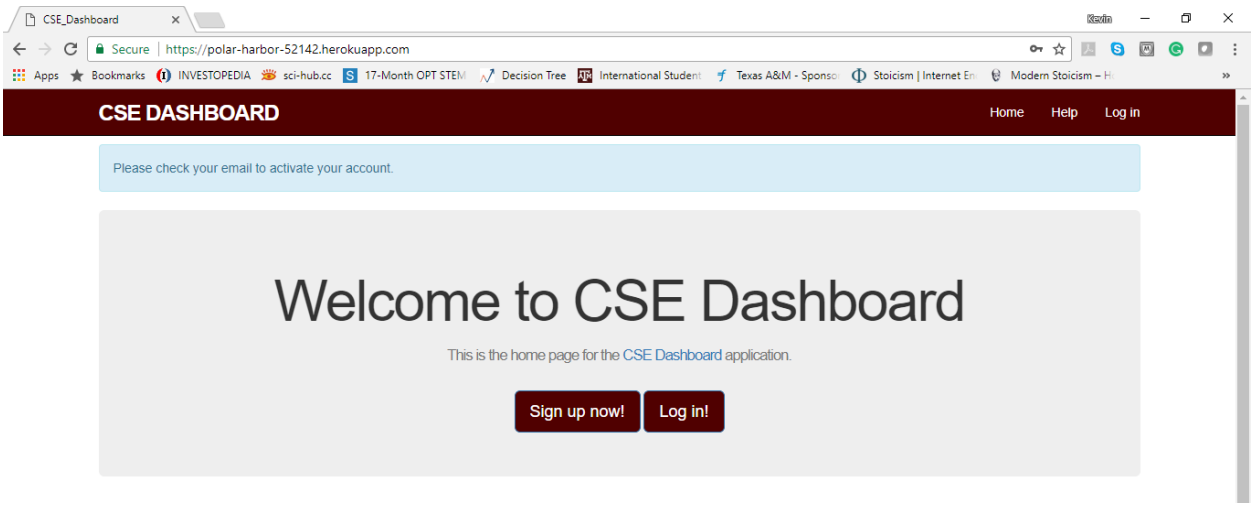
Update Profile Page

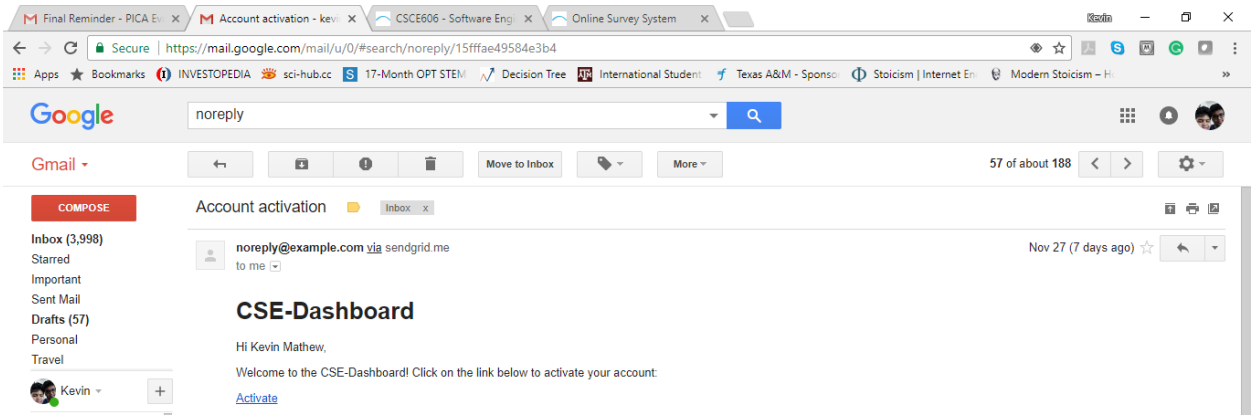




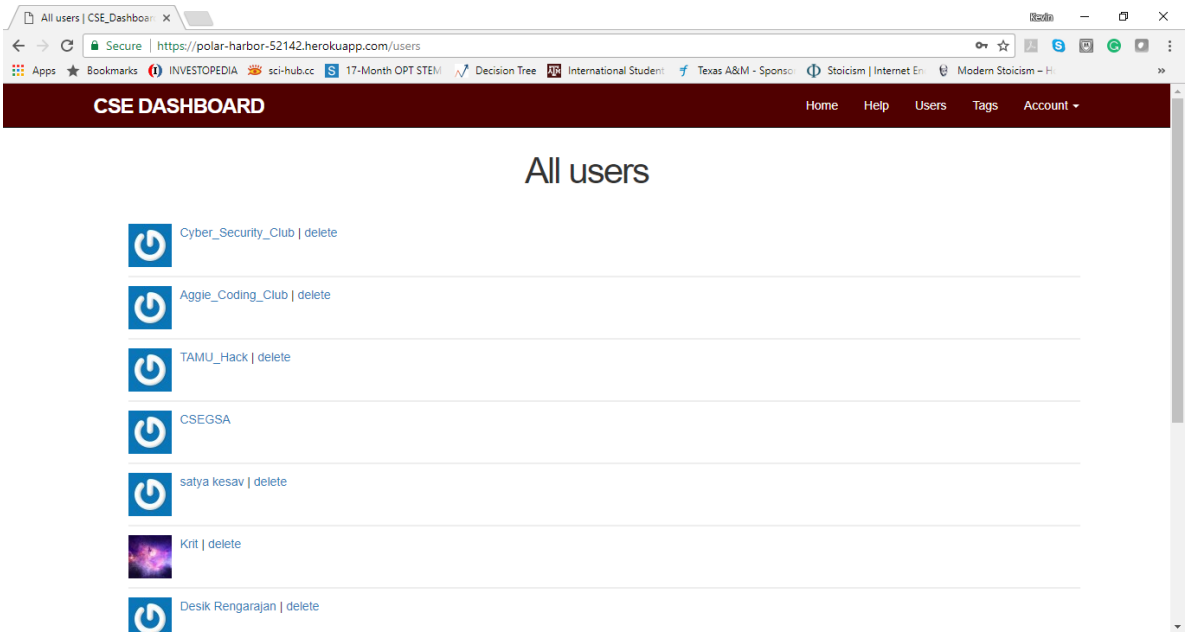
Email Activation



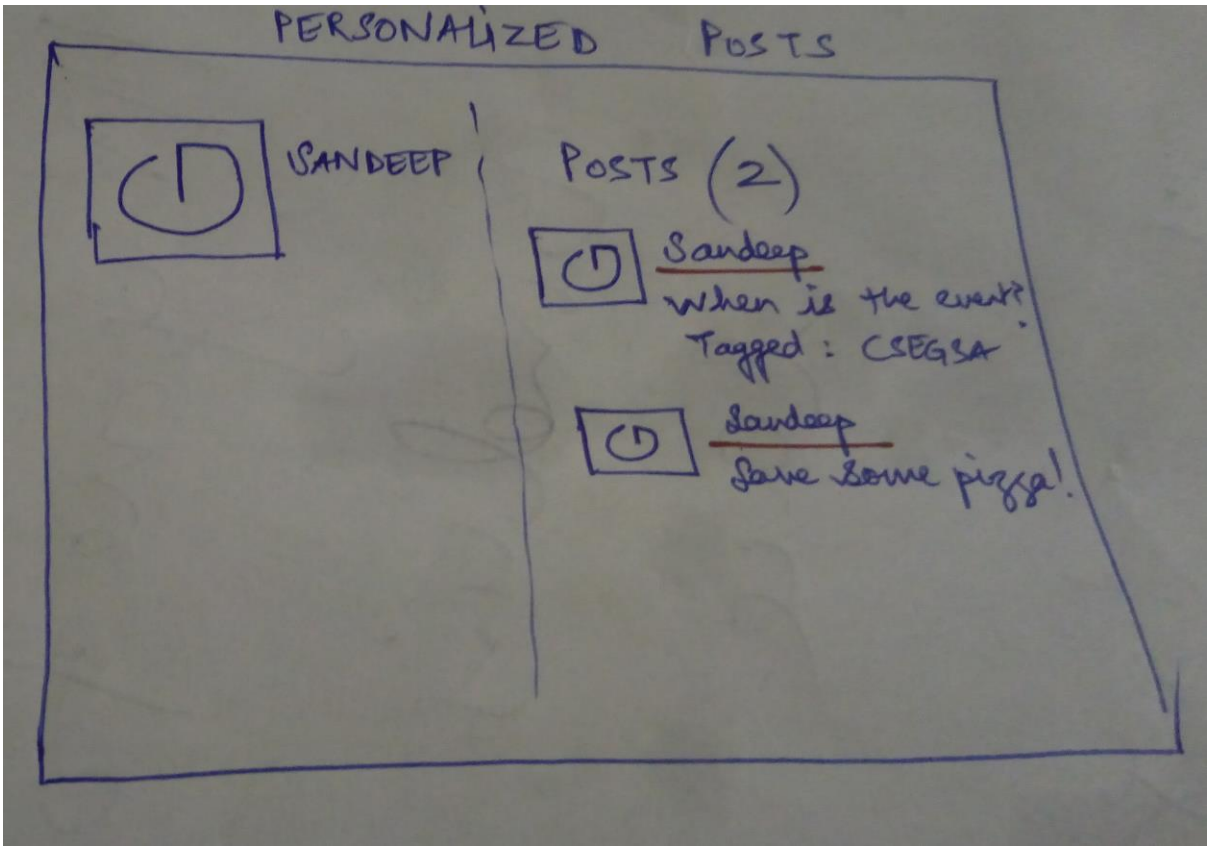


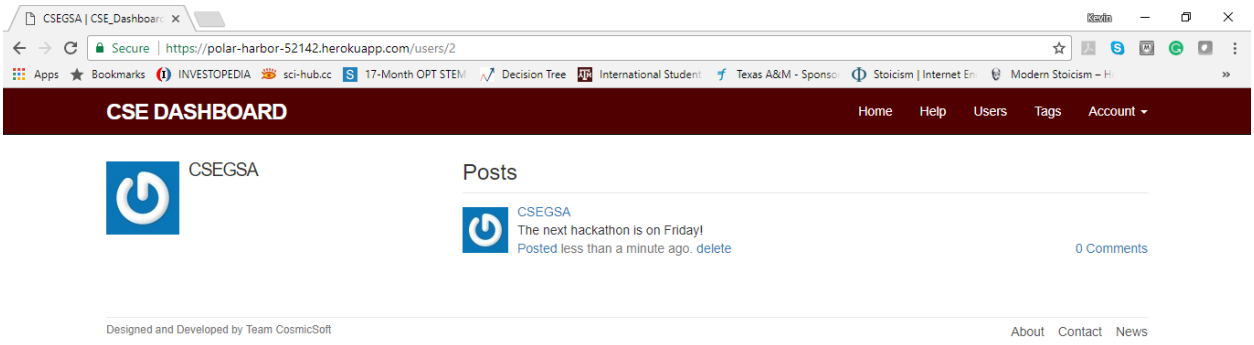


Admin: Delete Users

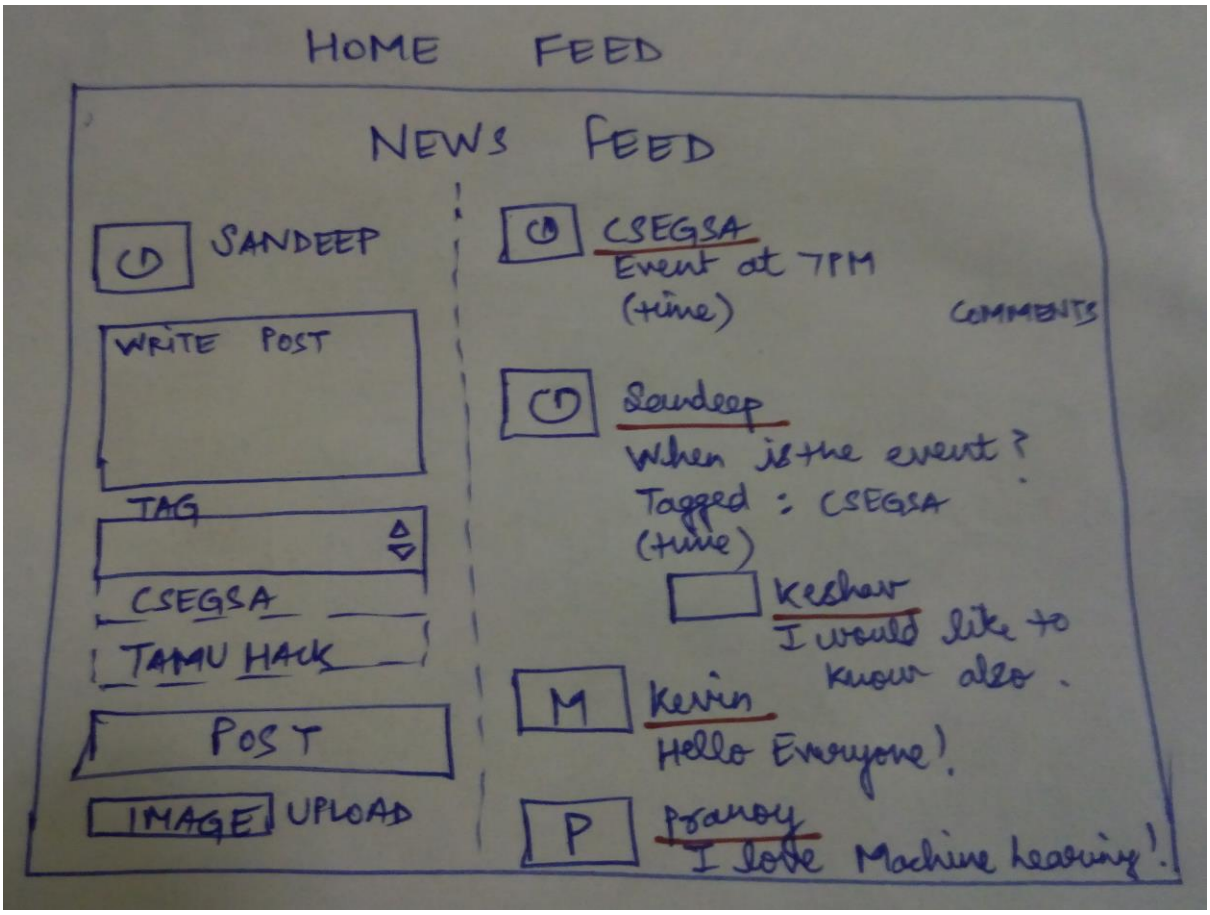


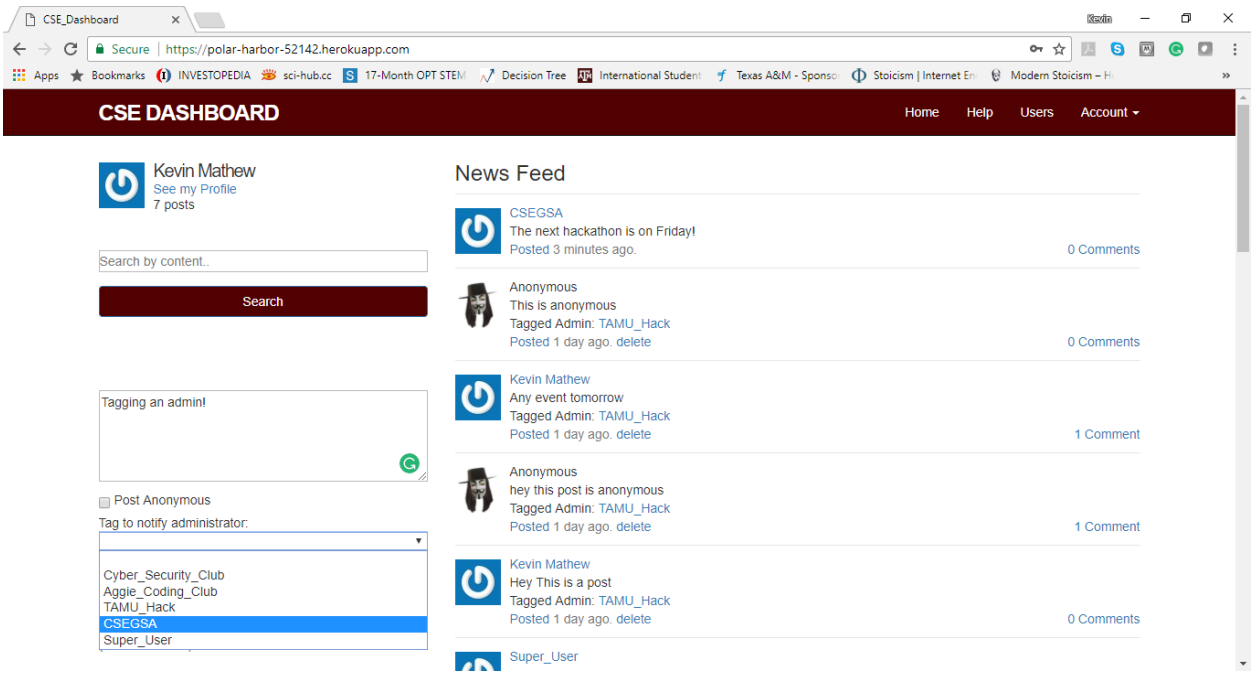
User: Profile Posts



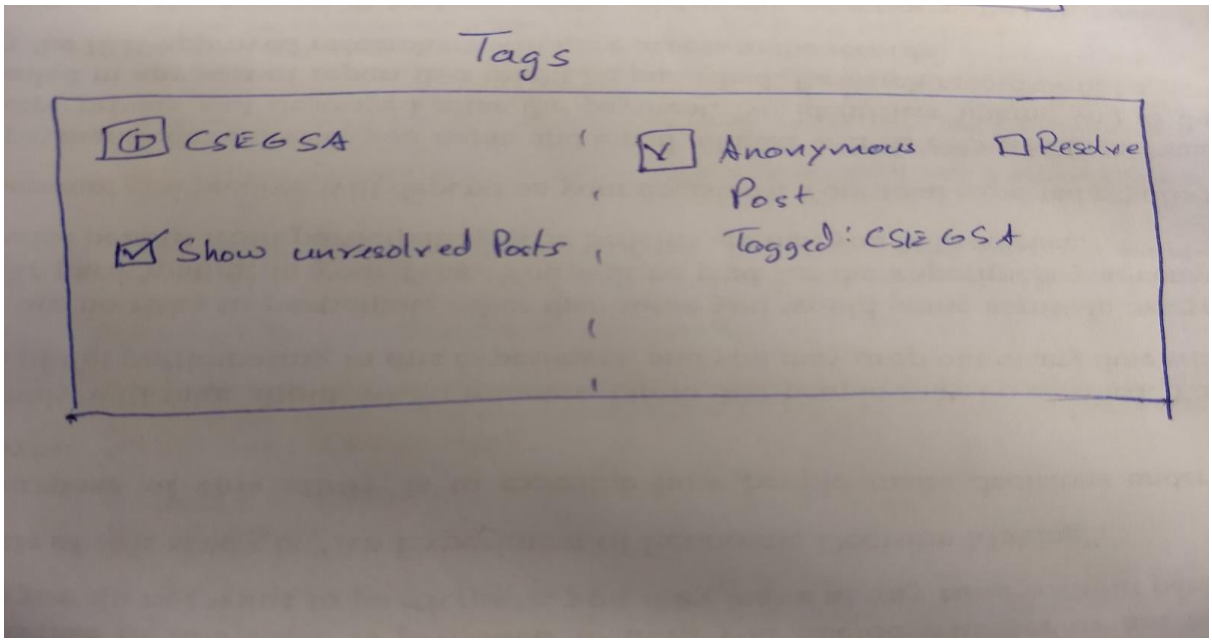


Tagging


HOME FEED
NEWS FEED
SANDEEP
WRITE POST
TAG
CSEGSA
TAMU HACK
POST
IMAGE UPLOAD
CSEGSA
Event at 7PM
(time)
COMMENTS
Sandeep
When is the event?
Tagged : CSEGSA
(time)
Keshav
I would like to
know also.
M
Kevin
Hello Everyone!
P
Pranoy
I love Machine learning!


CSE_Dashboard
Secure | https://polar-harbor-52142.herokuapp.com
CSE DASHBOARD
Home
Help
Users
Account
Kevin Mathew
See my Profile
7 posts
Search by content..
Search
Tagging an admin!
Post Anonymous
Tag to notify administrator:
Cyber_Security_Club
Aggie_Coding_Club
TAMU_Hack
CSEGSA
Super_User
News Feed
CSEGSA
The next hackathon is on Friday!
Posted 3 minutes ago.
0 Comments
Anonymous
This is anonymous
Tagged Admin: TAMU_Hack
Posted 1 day ago. delete
0 Comments
Kevin Mathew
Any event tomorrow
Tagged Admin: TAMU_Hack
Posted 1 day ago. delete
1 Comment
Anonymous
hey this post is anonymous
Tagged Admin: TAMU_Hack
Posted 1 day ago. delete
1 Comment
Kevin Mathew
Hey This is a post
Tagged Admin: TAMU_Hack
Posted 1 day ago. delete
0 Comments
Super_User

Admin: Tags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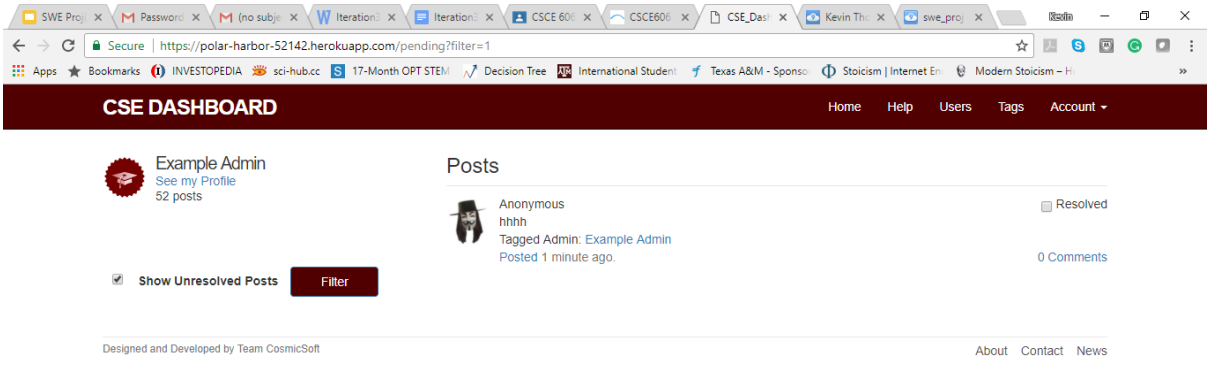
CSEGSA
Show unresolved Posts
Anonymous Post
Tagged: CSE GSA
Resolve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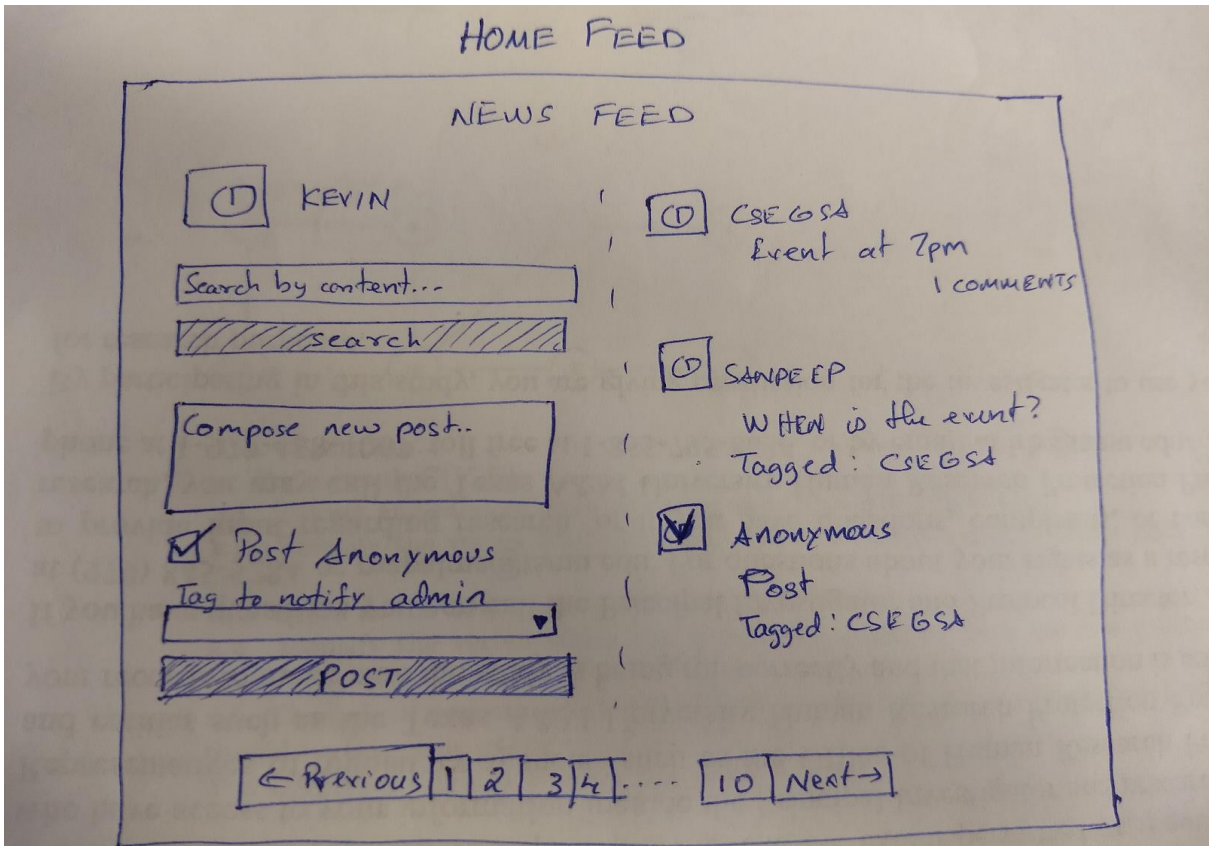
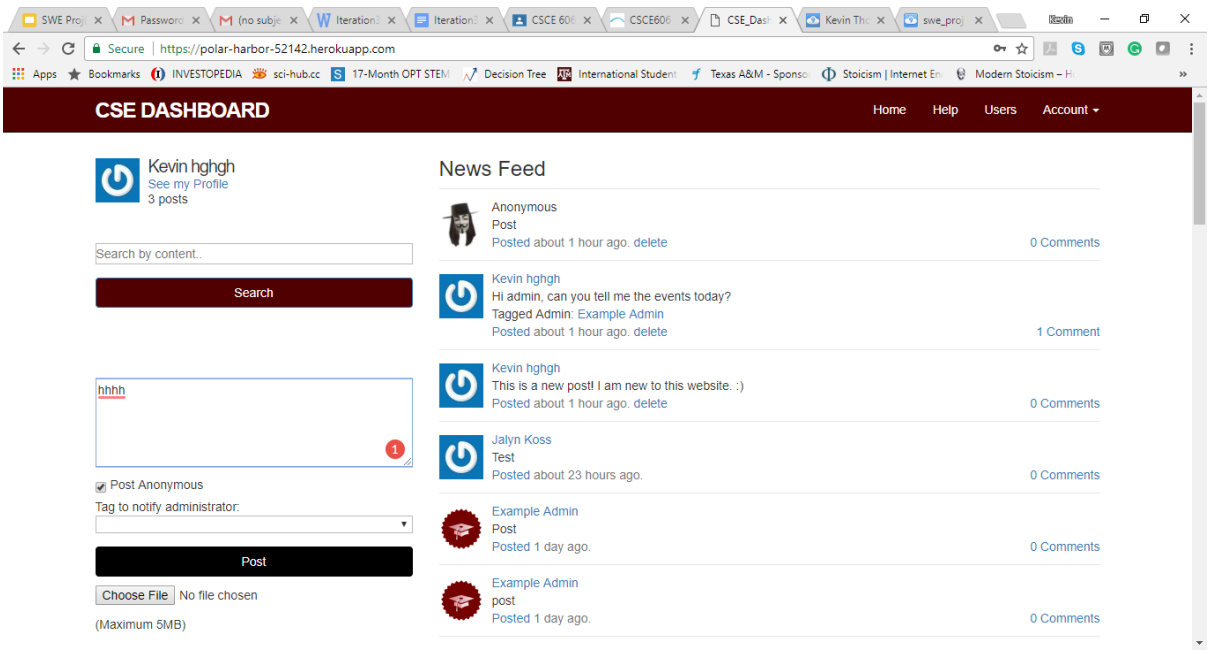
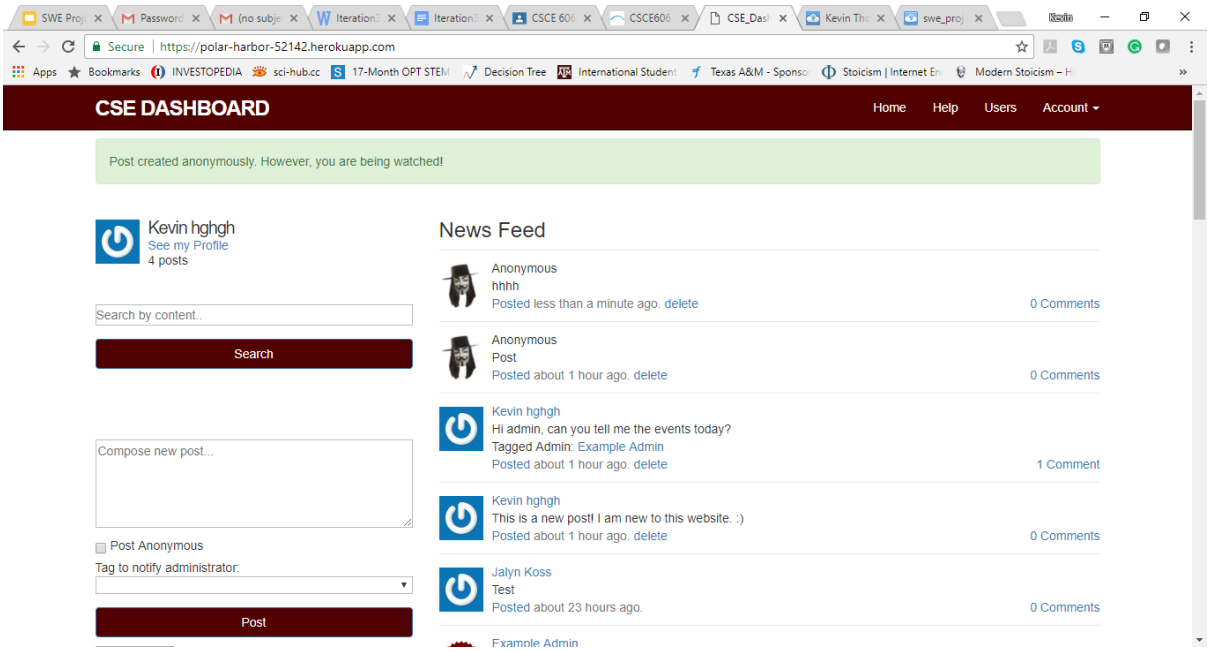
CSE DASHBOARD
Home
Help
Users
Tags
Account
Example Admin
See my Profile
52 posts
Show Unresolved Posts
Filter
Posts
Anonymous
hhhh
Tagged Admin: Example Admin
Posted 1 minute ago.
Resolved
0 Comments
Designed and Developed by Team CosmicSoft
About
Contact
News

Anonymous Posts



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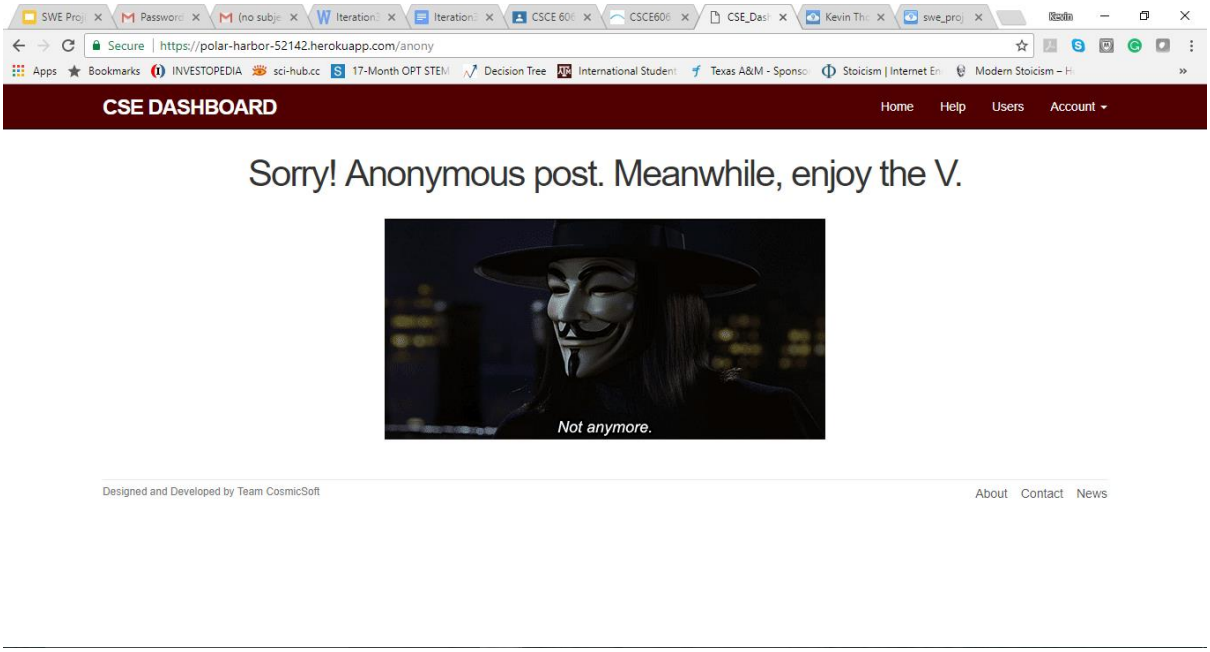
CSE DASHBOARD
Home
Help
Users
Account
Post created anonymously. However, you are being watched!
Kevin hghgh
See my Profile
4 posts
Search by content..
Search
Compose new post...
Post Anonymous
Tag to notify administrator:
Post
News Feed
Anonymous
hhhh
Posted less than a minute ago. delete
0 Comments
Anonymous
Post
Posted about 1 hour ago. delete
0 Comments
Kevin hghgh
Hi admin, can you tell me the events today?
Tagged Admin: Example Admin
Posted about 1 hour ago. delete
1 Comment
Kevin hghgh
This is a new post! I am new to this website. :)
Posted about 1 hour ago. delete
0 Comments
Jalyn Koss
Test
Posted about 23 hours ago.
0 Comments


Secure | https://polar-harbor-52142.herokuapp.com/anony
CSE DASHBOARD
Home
Help
Users
Account
Sorry! Anonymous post. Meanwhile, enjoy the V.
Not anymore.
Designed and Developed by Team CosmicSoft
About
Contact
News

TEAM STRUCTURE

Scrum Master – Sandeep Gottimukkala

Product Owner – Kevin Thomas Mathew

Team Members - Kevin Thomas Mathew, Sandeep Gottimukkala, Satya Kesav, Pranoy Kovuri, Krit Gupta

TEAM ASSIGNMENTS

Every member contributed to the code and the tests. This was done either individually or through pair programming. We maintained the same roles for scrum master and product owner throughout the project.

SCRUM ITERATIONS & USER STORIES

Iteration 0

- Assigned Team Roles of Product Owner and Scrum Master
- Met with the client to understand requirement and expectations
- Made a video with the client explaining the requirements
- Set up Pivotal Tracker account
- Set up GitHub Repository
- Made Lo-fi mockups of the UI
- Consolidated first wave of user stories on story boards
- Split up and prioritized user stories

Iteration 1

- The initial code repository was checked in with basic boiler plate code.
- Static Pages were developed. These include the Home page, Help, About, Contact Pages.
- The home page was modified to incorporate buttons for creating a User account.
- The key feature here is that validations on Username, Password, Email ID have been set up.
- Failure to satisfy these validations results in an error on the Signup page.
- Bootstrap was used for styling purposes.
- A nav-bar at the header remains constant across the platform with buttons for Home, Help and Login.
- A footer also remains constant across the platform.
- The underlying database is setup for production which for now contains a single table for the users with columns- Id, Name, Email and Password Digest.

We later also added the static page for Contact and News which redirects to the news page in the CSE department webpage. We also implemented some tests for the new functionality; 19 tests were written testing 39 different assertions. These were primarily unit tests for validation testing. We also set up the plan for iteration 2.

Iteration 2

- Sign Up functionality was added as part of Iteration 1. In this Iteration, we have combined them with the Login Functionality. The user can now login to the account he created.
- The logged in user also has the Logout functionality.
- Temporary session feature has been implemented.
- "Remember Me" feature has been implemented. The session is remembered even after the browser is closed.
- A Users tab has been implemented to see the list of all users. This can be done only if a user is logged in.
- Pagination has been implemented in the Users tab for showing more than 10 users.
- Pagination also includes Previous and Next functionality.
- A user can also update his profile including change username, password etc.
- Errors are also displayed on the screen in case of wrong entries during Profile update.
- Email activation has been incorporated. New users will receive an email asking them to activate their account.
- Forgot password feature also has been incorporated. An email will be sent to the user enabling them to change their password.

We made the token for the password update time sensitive (expires after 2 hours). 41 tests were written testing 151 different assertions. These are primarily unit tests for validation testing. We also set up the plan for iteration 3.

Iteration 3

- The User and admin will be able to see the News Feed which shows all the posts made by everyone using the application in a reverse chronological order.
- The User will be able to see a form where he can make a post or ask a query.
- Similarly, the administrator will also see the similar form.
- A user will be able to tag an administrator to his post to prompt the administrator to respond to his query. The list of administrators is available to the User in the form of a dropdown.
- The User and administrator will see a Profile page where they can view the posts that they made.
- Pagination is available for posts going over the stipulated limits both in the News Feed page and the Profile page.
- Comments for each post have been incorporated.

- Styling of the comments has been done in such a way that the comments are hidden by default. Clicking on “comments” opens up the list of comments and the comment text area.

  The comments are linked to each post so that the comments are deleted if a post is deleted. 58 tests were written. These are primarily unit tests for validation testing. Integration tests across various features have also been implemented. We also have planned for the final iteration.

Iteration 4

- The User and admin will be able to see the News Feed which shows all the posts made by everyone using the application in a reverse chronological order.
- The User will be able to see a form where he can make a post or ask a query with a button to choose to make it anonymously.
- Similarly, the administrator will also see a similar form.
- A user which posts anonymously cannot be seen by other users or admins but the identity remains stored in the database to be accessible in case the user needs to be deleted.
- Admins have the ability to delete users who use the website inappropriately.
- Users can search the News Feed for specific posts or content they are interested in.
- Admins can see posts they are tagged in and resolve these posts.
- Admins can filter posts they are tagged in to only view those which are unresolved
- Cucumber tests spanning over 120 steps and 20 scenarios to check the features
- Random testing the website to find inconsistencies in the functionality.

We also added a “Super User” to add new admins for expansion of the portal and to also remove them should they no longer be relevant. We also decided to allow for filtering of the posts to view unresolved ones to handle a large number of posts so admins can see the ones they have responded to and the ones they haven’t. 67 tests were written testing 195 different assertions. These are primarily unit tests for validation testing. Integration tests across various features have also been implemented.

CUSTOMER MEETINGS

Iteration 0

09/09/2017

- Customer Suggestions: Develop functionality first; Styling can be incorporated at a later stage

09/25/2017

- Customer suggests we try the TAMU theme for the website to reflect usability

Iteration 1

10/09/2017

- Customer Suggestions: Develop functionality first; Styling can be incorporated at a later stage

Iteration 2

10/23/2017

- Customer is satisfied with the progress and proposes an email activation functionality

Iteration 3

11/03/2017

- Customer is satisfied with the progress and wanted the token for the email activation to be time sensitive.
- He mentioned how the comments would help with the resolving of posts.

Iteration 4

11/22/2017

- Customer is happy with the product.
- We filmed the final video
- He mentioned the need for a Super User to extend the admins

TESTING (BDD/TDD)

Behaviour-Driven Design (BDD):

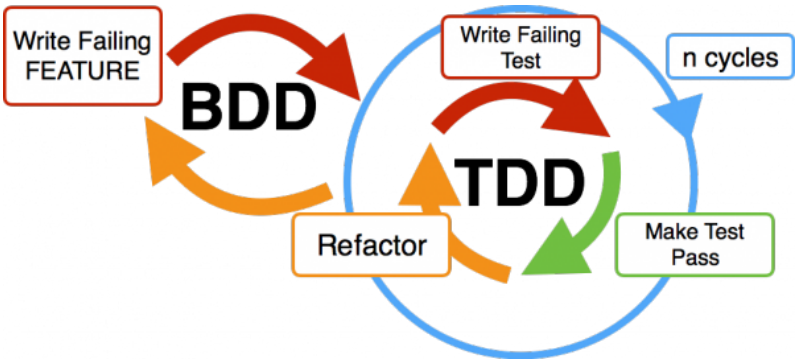
- BDD is also referred to as Specification by Example.
- BDD describes how the application is supposed to behave and appear to an outside observer and designed accordingly.
- Reevaluate the behavior of the application regularly and reflect on it often to make changes when necessary.
- The user stories are written in common language for all stakeholders
- We have used Cucumber tests with 20 scenarios and 120 steps to test the behavior of the application.

Test Driven Development (TDD):

- These tests are written before the development which fail initially
- The code is written to satisfy the tests
- The code is then refactored to be more acceptable to the specific needs of the user
- The code coverage is 93.16% of unit and integration testing

Random Tests:

- Small group of testers who had never before used the product (group of 6)
- Intensive alpha testing of the application (group of 5)



CONFIGURATION MANAGEMENT

We used Git for version control. We followed a system of only a few features per branch, all thoroughly tested to ensure we knew which branches were stable and allows us to roll back easily. We split up most branches and functionality among the team members to have an even distribution of work but also so we were aware of what versions of the application were stable and usable.

We were very careful with which branches were merged to master and none were merged without extensive testing. We had a development and production databases. We had one functionality, images on the server which caused a spike and had to have us try until we worked around it. There are 33 branches in the GitHub repository including master.

ISSUES IN THE PRODUCTION RELEASE PROCESS TO HEROKU

I am pleased to say that we did not face any issues with the deployment to Heroku. However, we did face problems with the database in Heroku being unable to store images for an extended period of time.

IMPLEMENTATION ENVIRONMENTS

The implementation environment is Cloud9, it is easy to work with and works especially well with Ruby on Rails. It is also useful as it can be accessed remotely and that allows for easy work and collaboration. We used its features of running the application on the development environment to make quick changes and notes to the errors are seen in the logs, this makes fixing the issues much easier as it won't be deployed or merged without due consideration.

We use SQLite in the development database and PostgreSQL in the production database.

DESIGN, CHALLENGES & LESSONS

Our design primarily focuses on keeping the portal easy to use and simple to intuitively operate. We allow users to view posts even though they are not logged in to make it easier to share posts among users, we also have pages for each individual post, making it easy to bookmark. We have a search feature and filters to make finding the information the user is looking for much easier to find, especially as the application grows. We focused on making sure we did not clutter the portal with unnecessary functionality that draws away from what it is meant to be and from the purposes it is meant to serve. We have made sure to put checks in place to ensure fair and complete moderation of the site to be used for it's intended purpose and nothing else. We have seen how both admins and users stand to benefit from less clutter and have natural incentives to use the portal as intended.

Some of the biggest challenges faced was initially when dealing with the learning curve of the newer technologies we were using, also was a challenge to develop the discipline it took to use the various tools used to manage the product. Through test driven development we found it very challenging to write tests initially, forcing us to think of a much more robust idea of what exactly the functionality must cover and how to test it.

We learned many lessons along the way, many in the lines of that the discipline and the challenges initially paid off in a big way as the project came to a close. To test all the features in unit tests at the end would have been a monstrous task and may have led to significant delays in the product. The tools allowed us to be organized, have a clear idea of the objectives and our progress. We can all swear by the pros of BDD+TDD, we have also learned to work together and trust one another to follow some degree of standard while developing applications to make it easer for everyone to use and fix bugs in the final product. It was a great experience that taught us a lot about what software engineering in today's world looks like.

TOOLS & GEMS

We use a variety of tools and gems for the application:

- gem 'rails', '5.1.2'
- gem 'bcrypt', '3.1.11'
- gem 'faker', '1.7.3'
- gem 'carrierwave', '1.1.0'
- gem 'mini_magick', '4.7.0'
- gem 'fog', '1.40.0'
- gem 'will_paginate', '3.1.5'
- gem 'bootstrap-will_paginate', '1.0.0'
- gem 'bootstrap-sass', '3.3.7'
- gem 'puma', '3.9.1'
- gem 'sass-rails', '5.0.6'
- gem 'uglifier', '3.2.0'
- gem 'coffee-rails', '4.2.2'

- gem 'jquery-rails', '4.3.1'
- gem 'turbolinks', '5.0.1'
- gem 'jbuilder', '2.7.0'
- gem 'rails-controller-testing', '1.0.2'
- gem 'minitest-reporters', '1.1.14'
- gem 'guard', '2.13.0'
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- gem 'cucumber'
- gem 'cucumber-rails', :require => false
- gem 'cucumber-rails-training-wheels'
- gem 'database_cleaner'
- gem 'capybara'
- Heroku
- GitHub

Bcrypt gem was used for password maintenance. The password is converted to a hex character and stored in the database, thus adding additional security in case the database is compromised. Uglifier compresses the JavaScript to an almost unreadable format to save space on the server. We use simplecov to check the code coverage and other statistics can be checked too.

GITHUB REPOSITORY

Our GitHub repository can be found here.

OTHER IMPORTANT LINKS

Our Pivotal Tracker project can be found here.

Our application can be found in Heroku here.

Our application demo can be found here.

The first iteration video interviewing with the customer can be found here.

The final iteration video interviewing with the customer can be found here.

Our YouTube channel can be found here.