



EMERGING TECHNOLOGIES AND ANALYTICS

Digital Documentation

Agile project plan for website improvement

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MEET E.T.A.



Luke Dornburgh | Lead Developer

Luke Dornburgh is a senior Computer Information Systems major at James Madison University. Following graduation, he will be pursuing a career in software development with a to-be-determined firm. Luke spent the last two summers interning at GDIT in NOVA. Luke is also a member of Beta Gamma Sigma.



Cayla Evans | Database Developer

Cayla Evans is a senior at James Madison University majoring in CIS. Following graduation, Cayla will be joining Precisely as a Data Security Analyst. Cayla is also an active member of WIT, Outdoor Adventure Club, and Alpha Omega Epsilon, a sorority for women supporting women in technology.



Melody Haak | UI/UX Specialist

Melody Haak is a Senior SMAD major with a concentration in Interactive Design and a minor in Educational Media. Following graduation in the spring, Melody will be working as an Instructional Systems Designer for a non-profit tech institution that does contracting for the federal government.

MEET E.T.A.



Justin Moore | Back End Developer

Justin Moore is a senior Computer Information Systems major at James Madison University. Following graduation, Justin plans to pursue a career in cybersecurity or computer programming.



Glorious Njoroge | Project Manager

Glorious Njoroge is currently a senior at James Madison University majoring in both CIS and Marketing. Following graduation, Glorious plans to continue to pursue a career as a data analyst. Glorious is also an active member of Alpha Kappa Psi, a business fraternity. Following graduation, Glorious will be working at CapTech as a Business Analyst.



Jaylen Tyree | Database Developer

Jaylen Tyree is currently a senior at James Madison University majoring in Computer Information Systems. Following graduation, Jaylen will be working at Accenture Federal Services as a Technology Analyst.

MEET E.T.A.



Andres Villalon | Database Developer

Andres Villalon is currently a senior at James Madison University majoring in Computer Information Systems. Following graduation, Andres will be joining Optum as a Product Management Associate. Andres enjoys to play golf and play video games on his free time



Mya Warren | Client Liason

Mya Warren is currently a senior at James Madison University majoring in Computer Information Systems. Following graduation, Mya plans to pursue a career as a technology risk consultant. Mya is the President, founder, and co-chair of multiple DEI-focused organizations on campus.



Julia Yeager | Visual Designer/ Front-End Developer

Julia Yeager is currently a senior Media Arts and Design Major concentrating in Interactive Design with a minor in general business. Following graduation she hopes to pursue a career in meaningful media communication. Julia is the current Design Editor of The Bluestone, Creative Director of Bluestone Communications, and Vice President Community Relations of her sorority, Tri Delta.

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OVERVIEW

PROJECT SUMMARY

We will be helping Madison Connect Hub to make a website that will increase efficiency, usability, and improve collaboration for research among students and faculty. We will then extend the functionality to improve the website to provide a better user experience. For example, we will incorporate a way to search by skills, have a user messaging system, and see teammates' availability to make scheduling easier. We will develop this site using C# and HTML, and consistently incorporate user testing and UX/UI principles into our development. We will also make the site visually appealing by following a created style guide and branding. We will ensure our project meets expectations by meeting with the client throughout the project and using all input to improve the interface. The end goal is to develop a website that easily allows students and professors to collaborate on projects. E.T.A. will be making the website more accessible and allow each user to collaborate on projects much easier and more efficiently than ever.

DESIGN QUESTION

How can we improve the experience for students and faculty to collaborate easily on projects that they make?

CURRENT SCENARIO

Madison Connect Hub is a site that allows students and faculty to create newfound connections based on similar interests in research and projects. The Hub is looking for a "redesign" that elevates its current features and implements new ideas, such as: creating a more dynamic home page, implementing email notifications, allowing users/teams to make evaluations, integrating document upload capabilities, and problem-solving topic search by keyword pain points.

USER NEEDS

01 Students and faculty should be able to collaborate easily and quickly on various projects

02 An easily navigable website for users and prospective users

03 Users of the website should be able to easily see other user's skills, interests, and availability.

04 Users should be able to ask other prospective users to join their project through the email

OVERVIEW

Technical Goals

Build an organization-specific, web-based system, that lives in the cloud on an Amazon Web Services (“AWS”) SQL Server database instance

Build a system for Madison Connect Hub that meets all of their requirements while also having safe and secure code.

USER INTERFACE SOLUTION

Madison Connect Hub's main value is communication and collaboration for all the users who are sign-up for the website. E.T.A. throughout the sprints kept this value in mind and made sure to incorporate it as part of the redesigned website. We did this by making a messaging system within the website. The messaging system will allow users, students, or professors, to send a message regarding a project or a conversation between two people or a group. We also made a calendar for users to see upcoming dates for projects. This will allow for easier communication and transparency for the team working on a project together.

OBJECT ORIENTED PROGRAMMING

Our web application is comprised of web forms created to implement specific pieces of functionality to address all of the client's needs. We used C# which is an object-oriented language, our back-end developers relied on the objects and methods that we created. We also created a class specifically for hashing the passwords which will keep all of the passwords secure. Our front-end developers also use bootstrap to improve the value of our website through aesthetics and ease of use. Bootstrap was incredibly valuable to make each layout of the pages easily navigable and easy to use for any user.

OVERVIEW

AMAZON WEB SERVICE (AWS)

AWS Beanstalk is the environment E.T.A. launched on AWS. This environment will run on an EC-2 instance and connect to an RDS database. ConnectHub and Auth, are the two databases that will run on our RDS database, and Auth is used solely for storing login information and other credential-related data.

Our instance has the following specifications:

- Type: t2.micro
- Region: US East (N. Virginia)
- OS: Windows
- vCPUs: 1

\$12 per month is the estimated price for the on-demand elastic compute pricing based on the above specifications.

\$32 per month is about the total price for the service of the RDS database on a db.t3.small instance, but ours is currently hosted on a db.t2.micro which will decrease the price. Amazon does not list the specific price of our instance in their AWS Pricing Guide. The total cost for a month should not exceed \$45 including any growth/overage since it is based on a higher-tier RDS instance.

More information about the pricing can easily be adjusted or changed if you visit AWS Pricing Guide.

MADISON CONNECT HUB

MISSION STATEMENT

Easily connect students with **similar passions** to each other and appropriate mentors in a **collaborative space to solve problems.**

CURRENT SYSTEM

1

**Difficult to
express your
value on your
profile**

Madison Connect Hub's system only allows user to add up to 7 skills per user limiting the range a user can have. There also is no way to upload and display a resume if a user wanted to.

2

**Lack of
user-to-user
interaction**

Communication is key to the formation of great teams, and currently, there is no way for users to communicate on the website.

3

**Difficult for
project owners to
find the right
people**

If a project owner knows a specific skill they would need for a project, currently, there is no way to search all users for that skill.

MADISON CONNECT HUB

CURRENT SYSTEM

4

Users lack pathways to find interesting projects to join

Madison Connect Hub's system doesn't have a way to suggest projects to users that they may be interested in.

OUR GOAL

Create a website that **actively encourages collaboration** and connections between faculty and students while also **assisting in the formation of great teams**.

PROJECT GOALS & USER STORIES

PROJECT GOAL

USER STORY

Create an easy and accessible web application

As a user, I want to have an accessible web application so I can collaborate with other students, professors, and alumni.

Encourage connectivity

As a user, I want to connect with others so we can work on projects together.

Increase the capabilities of the website

As a user I want multiple website capabilities so I am satisfied with the uses

Bring in new users

As a user, I want a way to invite others to the connect hub so they can work on projects they may find interesting

Allow for the website to be easily remodeled in the future.

As a user, I want a website that could have future updates so I can have continued good experiences as my needs change

Stakeholder Interview

Question: In your opinion, what are the strengths of the Madison Connect Hub?

The Hub could pull a network analysis to provide information on how and where people are searching for collaboration, what they are looking to do, gaps on campus, etc.

Question: What are some concerns you have with the Madison Connect Hub?

It is only as good as the number of folks using it. It needs to be a cultural phenomenon for people to use it. It needs to be easy to use to promote use.

Question: How can the Madison Connect Hub improve its experience for users?

Incorporating a view of past works, work habits and/or workflow (are they a perfectionist, iterative, like constant feedback, etc.), the stakes of the project (low stakes vs. high stakes), and preference of pay (do they want to get paid or will they offer to pay?), decision tree on if I considered one project, listing suggestions.

Question: Do you see any way to promote the Madison Connect Hub?

You have to make sure to find a group to become a highly adaptive and adoptive user, and trade people in and out so that use spreads. Exposure in a phased interaction is key. "Like how a virus spreads".

Places On Campus that Can Use Madison Connect Hub:

- FYRE
- X Labs
- JMU Honors
- Student Affairs
- Gilliam Center
- COB 300
- OSF- Open Science Framework

Suggestions to Think About:

- Matching system
- Rating system
- Talk to Deans/AUH/Faculty in departments and learn what skills each major must learn
- Link projects into OSF



PATRICE LUDWIG

WHO IS PATRICE LUDWIG?

Dr. Ludwig is a Biology professor that teaches first-year and upper-division. She started teaching X lab classes in 2015 because she was identified as someone who looks for collaborators to help solve problems. She was the Director of Research for X-Labs last summer, and now she is the Interim Director.

CHRISTY HANSON

PROFILE

Christy is a junior Engineering major enrolled in 16 credits this semester and is involved on campus as the VP of a Women in Stem Sorority. She puts her pressing schoolwork first in her priority list however, she is looking to start research to make her a competitive applicant for future employers.

GOALS

Chrsity's goal is to start her own project and have fellow students and faculty join her project. She wants to be able to have her project displayed for members of the site to easily browse her project and potentially join.

KEY ATTITUDES

- Is excited to make connections and people who could help her attain her goals.
- Looking for good usability and responsiveness throughout the site

FRUSTRATIONS

- Inability to connect with students and faculty with desired skills across all majors
- Has limited time to work on projects



"I want to propose a project that I have been working on independently so that I can find experts in the field that can help me further my goals!"

Age: 20

JMU Affiliation: Undergraduate Student

Area of Study: Engineering

Technological skills: High

Devices Used: MacBook, iPad, iPhone, Apple Watch

NEEDS

Christy needs a site that can connect her to other students and faculty. Being a full-time student and involved, she is conducting her research on the side and needs the site to be efficient. **She wants to collaborate with those of different skills across all majors** but doesn't know how to connect with them. Once she connects with a team to help her, she wants to stay in contact with them. **She needs a messaging feature** that will allow her to communicate with her team and tell them her goals for the project as well as manage all the moving parts.

DR. JAMES TOWKAN

TYPICAL WEEK AT THE OFFICE

Dr. James Towakn is an associate professor at James Madison University. He teaches in the Chemistry Department and instructs a total of 4 classes and 2 labs throughout the week. He is a very busy man academically and is always looking to branch out and interact with his students.

GOALS

Dr. Towaken's goal is to get involved in projects of some promising young students across the university. He wants to offer his help to projects related to chemistry and fulfill his love for research. He also wants to use the calendar feature to schedule various meetings with faculty and students, and fit it into his busy schedule.

KEY ATTITUDES

- Has a deep love for research
- Is driven by a want to help students succeed
- Is adverse to unnecessarily complicated technology

FRUSTRATIONS

- New-age social sites are hard to navigate
- Not being notified of new project updates via email



"I want to help offer my expertise to students in need of advising or academic guidance."

Age: 50

JMU Affiliation: Associate Professor

Area of Study: Chemistry

Technological skills: Low

Devices Used: PC, Android

NEEDS

Dr. Towakn needs a site where he can find projects that students are working on. He wants to offer his help to existing projects, **He needs a way to filter through existing projects by topic** so that he can find projects including chemistry. He also wants a way to connect his colleagues at JMU to projects they may be interested in. **He needs a "suggest" mechanism** so that he can suggest specific projects to fellow professors to the hub. Lastly, Dr. Towakn is very busy with his job. He teaches classes, holds office hours, has a family, and conducts his own research. **He needs to see teammates' availability** to know if it is reasonable to help with the project.

FUNCTIONALITY FEATURES

Profile Skills

The screenshot shows a user profile for Christy Hanson. At the top, there is a small thumbnail photo. Below it, the name "Christy Hanson" is displayed, followed by her college information: "Integrated Science and Engineering". Her contact details are listed as: Phone: 703-098-7891 and Email: ch@jmu.edu. To the right of this information is a large, empty rectangular area. Below this section, there are three boxes: "Skills" (listing ASP.net, Amazon EC2, Azure Kubernetes Service, CSS, Data Analysis, Databases, HTML5, JavaScript, JSON, .NET Framework, Python, Software Development), "General Availability" (listing M-W-F: 2:00pm - 7:00pm), and "Personal Interests" (listing "I enjoy travelling, gaming, hiking with friends, and Netflix"). At the bottom right of the page is a purple speech bubble icon.

This feature allows a user to display their skills on their profile. This helps a user show their personal and professional value to other users. This can help users see who would be good additions to help on their project and ultimately help users create great teams.

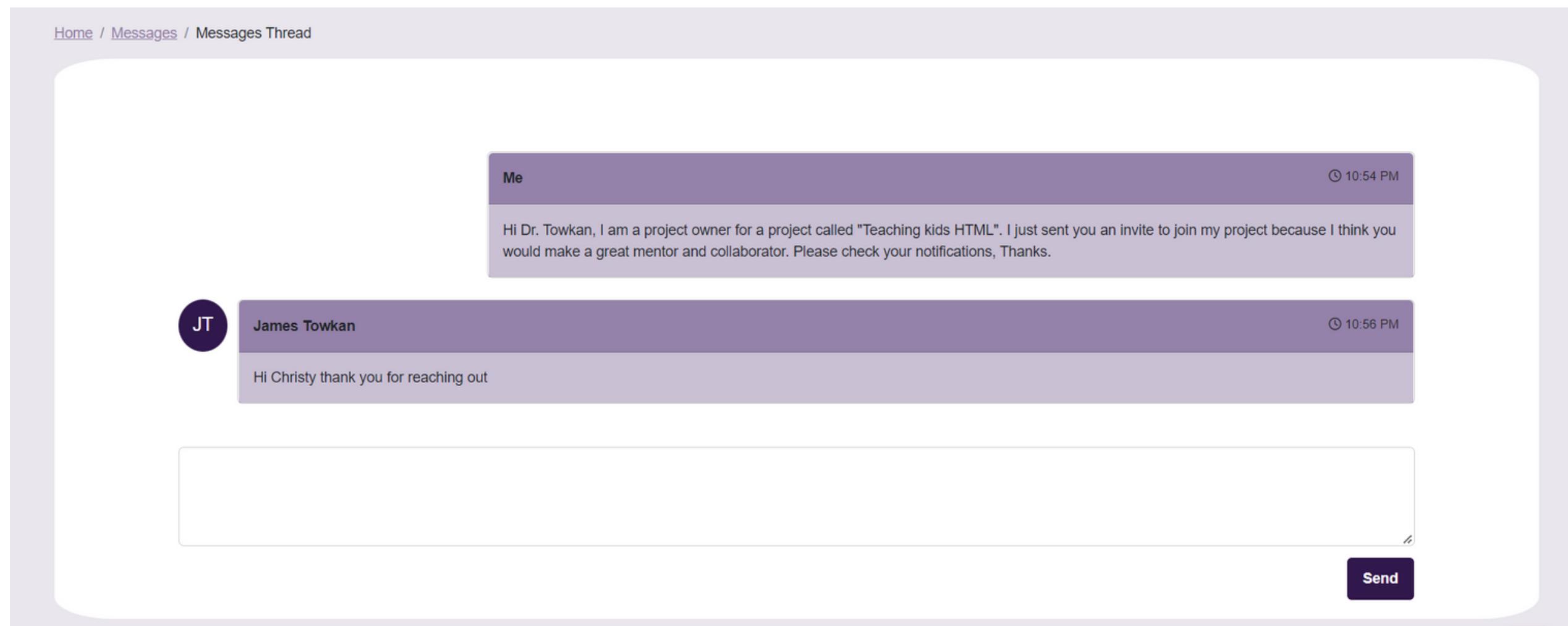
Filter People by Skills

The screenshot shows a search interface titled "Browse People". On the left, there is a sidebar titled "Filter by Skills" with a "Clear Filters" button and a search bar. Below the search bar is a list of skill categories, each with a checkbox and a "Apply" button at the bottom. The listed skills include: A#, Adobe Photoshop, Account Management, Accounting, AutoCAD, Advertising, Adobe Illustrator, Adobe InDesign, Afrikaans, Agile Methodologies, Akamai, Akan, Akeneo, Albanian, Algorithms, Alternative Energy, Alumni Relations, Amharic, Analytical Skills, Angular JS, Apache, Apache Spark, Arabic, Armenian, and another "A#" entry. The main area is titled "Browse People" and contains three profiles: Luke Dornburgh (Position: Student, Skills: Computer Engineering, CSS, HTML, Software Development), James Towkan (Position: Faculty, Skills: Agile Methodologies, Computer Engineering, CSS, HTML5), and Michael Kirkpatrick (Position: Faculty, Skills: Azure Kubernetes Service, Azure Virtual Machines, HTML5, Web Development). Each profile includes a "View Profile" and "Invite" button, and a purple speech bubble icon.

This feature allows a user to search for teammates through filtering by skill. This means that they can find teammates who would be the best addition to projects they are working on. In turn, having the users with the most applicable skills for a specific project helps users create the best teams possible.

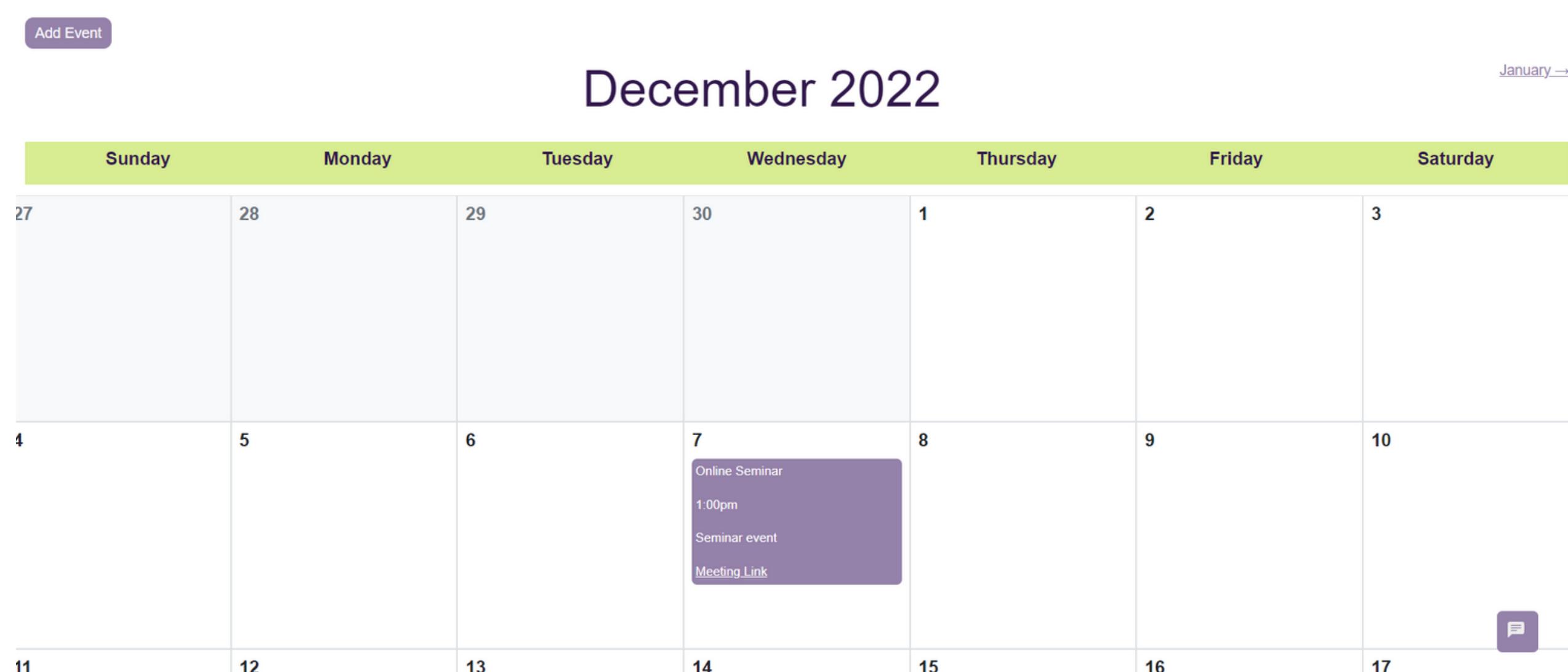
FUNCTIONALITY FEATURES

Messaging



This is a messaging feature in which users can have conversations locally. This allows a user to message other people on the site and get to know them before they add them to a team, or discuss details of their project. This helps users create great teams and work effectively on projects because they can get to know one another to determine if they would be good collaborators, and allows them to keep in touch once they are already working on a project together.

Calendar



This is a calendar feature that allows users to add events. This helps users keep track of meetings related to projects they are working on with the Madison Connect Hub. This allows users to create great work because it serves as a planning tool to ensure they can commit to their projects time-wise.

FUNCTIONALITY FEATURES

Filter Projects by College

The screenshot shows a user interface for filtering projects by college. On the left, a sidebar titled 'Filter by JMU College(s)' lists several categories with checkboxes: Arts and Letters, Business, Education, Health and Behavioral Studies, Integrated Science and Engineering, Science and Mathematics, and Visual and Performing Arts. The 'Business' and 'Science and Mathematics' checkboxes are checked. Below these are 'Apply' and 'Clear Filters' buttons. The main area is titled 'Browse Projects' and features a search bar with placeholder text 'Search for Projects...'. Below the search bar are two selected filters: 'Business' and 'Science and Mathematics'. The results are displayed in a grid of three project cards. The first card is for 'COB 300 - Reusable Straws', which involves creating products from less detrimental materials. The second card is for 'Language Transcription Service - Website', aimed at helping study abroad students. The third card is for 'The Art of Physics', which involves discovering and photographing physics principles. Each card includes a 'Request to Join' button and a 'See Details →' link.

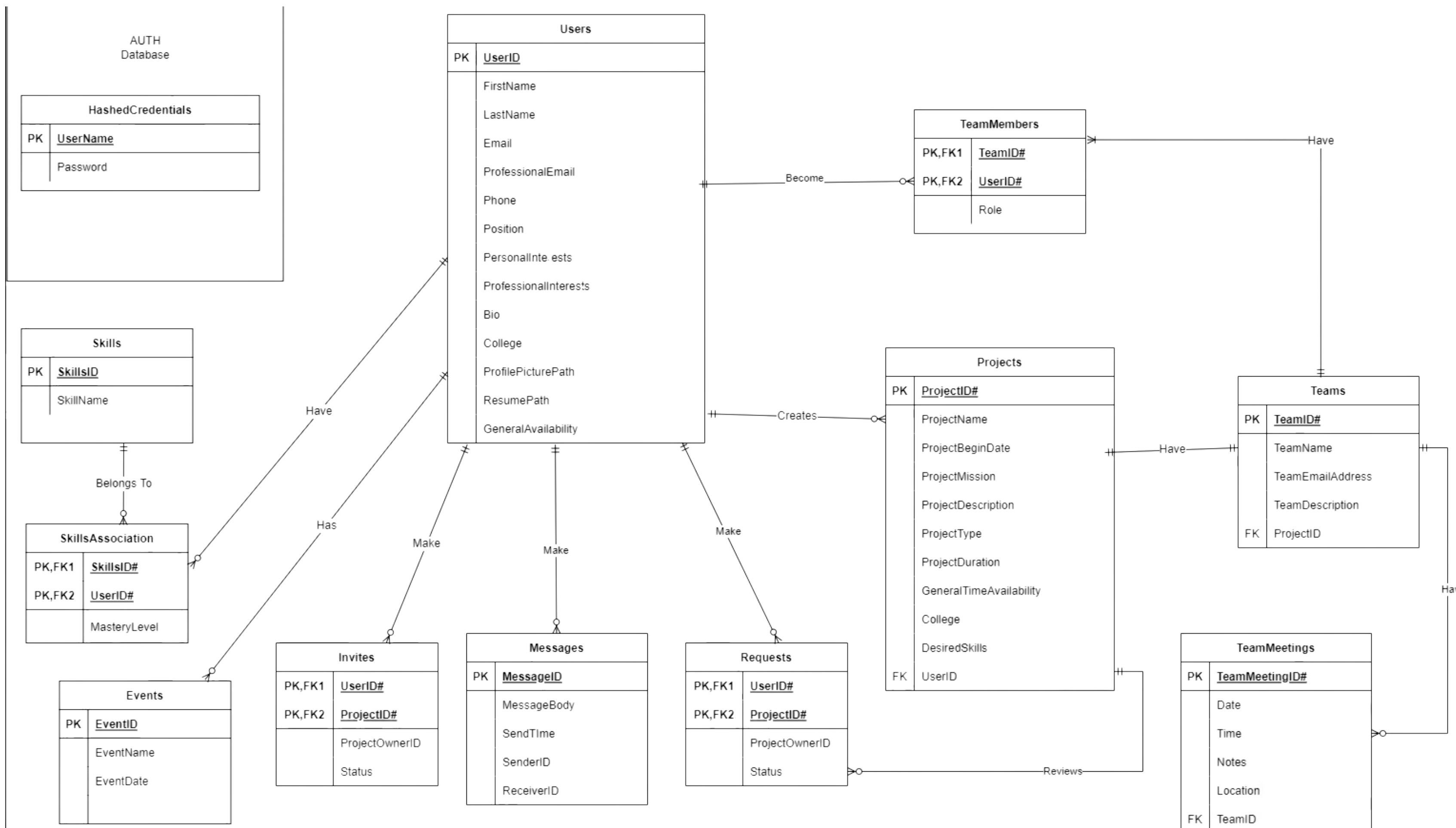
This feature allows users that are looking for projects to join, to filter through projects by JMU college. This allows the user to narrow down their searches to projects they are more likely to be interested in working on. This helps our users create great teams by ensuring that all of the users are invested in the work they are doing.

Feedback

The screenshot shows a 'Feedback' modal window overlaid on a dark background. The modal has a white background and contains the text 'Got a comment or question? Let us know!'. At the bottom right are 'Close' and 'Send Email' buttons. In the background, a Gmail inbox window is visible. The inbox shows an email from 'lukedornburgh@gmail.com' to 'madisonconnecthub@gmail.com' with the subject 'Feedback for Madison Connect Hub'. The email body is empty. The Gmail interface includes a toolbar with 'Format' options like bold, italic, underline, and heading levels (Heading 1). The message was sent from 'Mail for Windows'. To the right of the inbox, a project card for 'The Art of Physics' is partially visible.

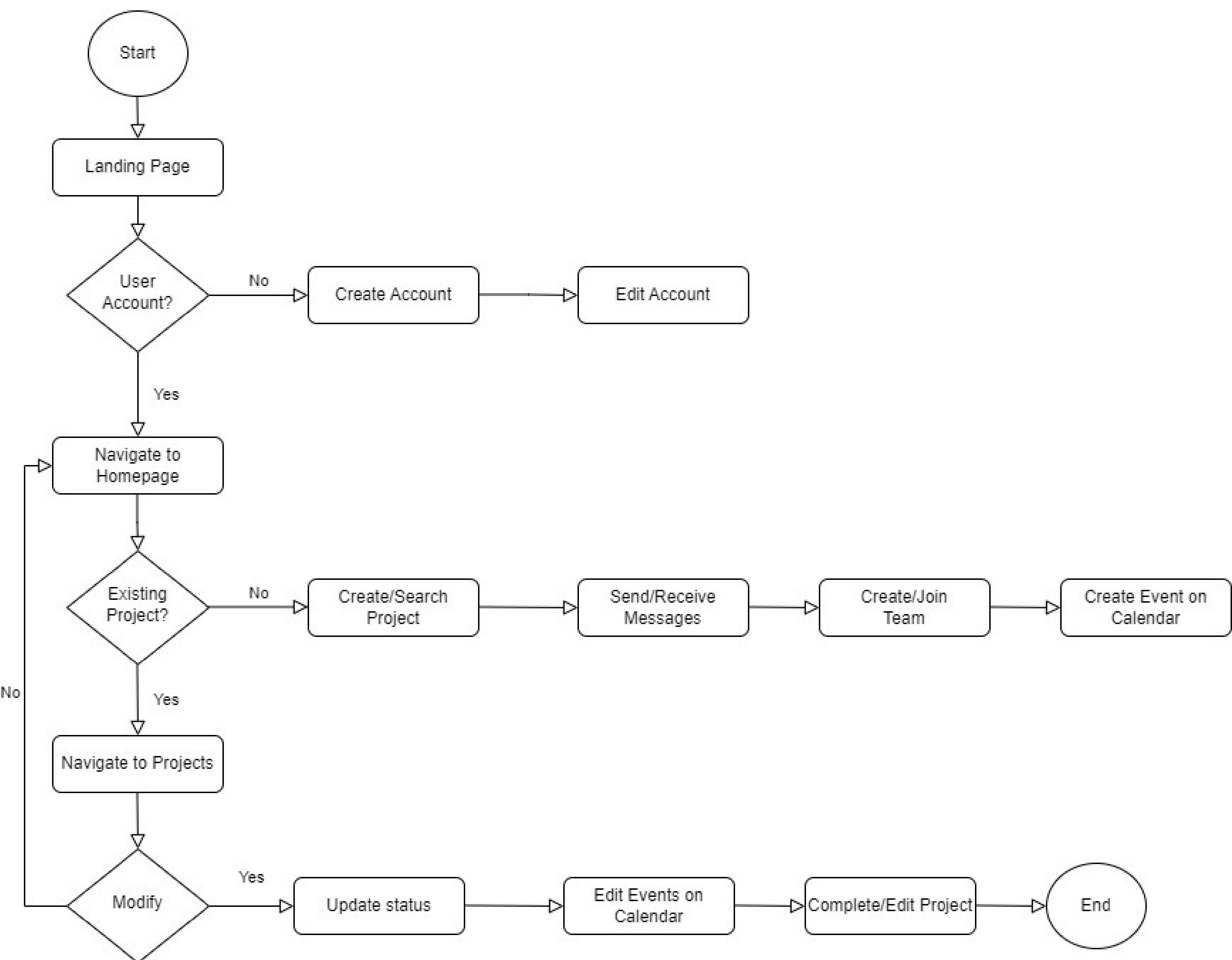
This is a feedback feature. It allows users to communicate with the administration of the Madison Connect Hub, so any issues they have can be resolved to ensure they have a great experience interacting with the site, creating teams, and working on projects.

ERD DIAGRAM



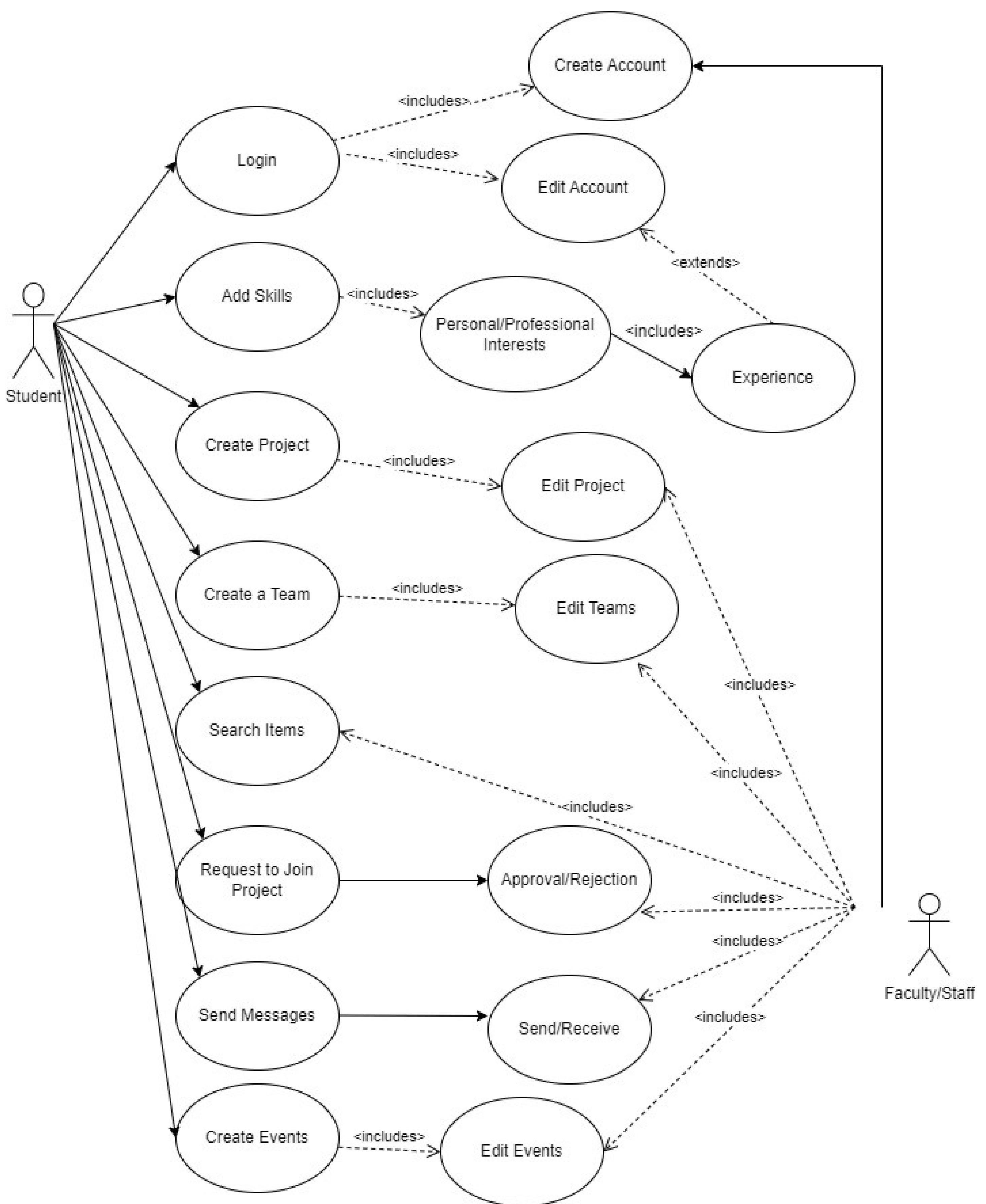
The Entity Relationship Diagram (ERD) above, shows the relationship and interactions between each object above.

FLOW DIAGRAM



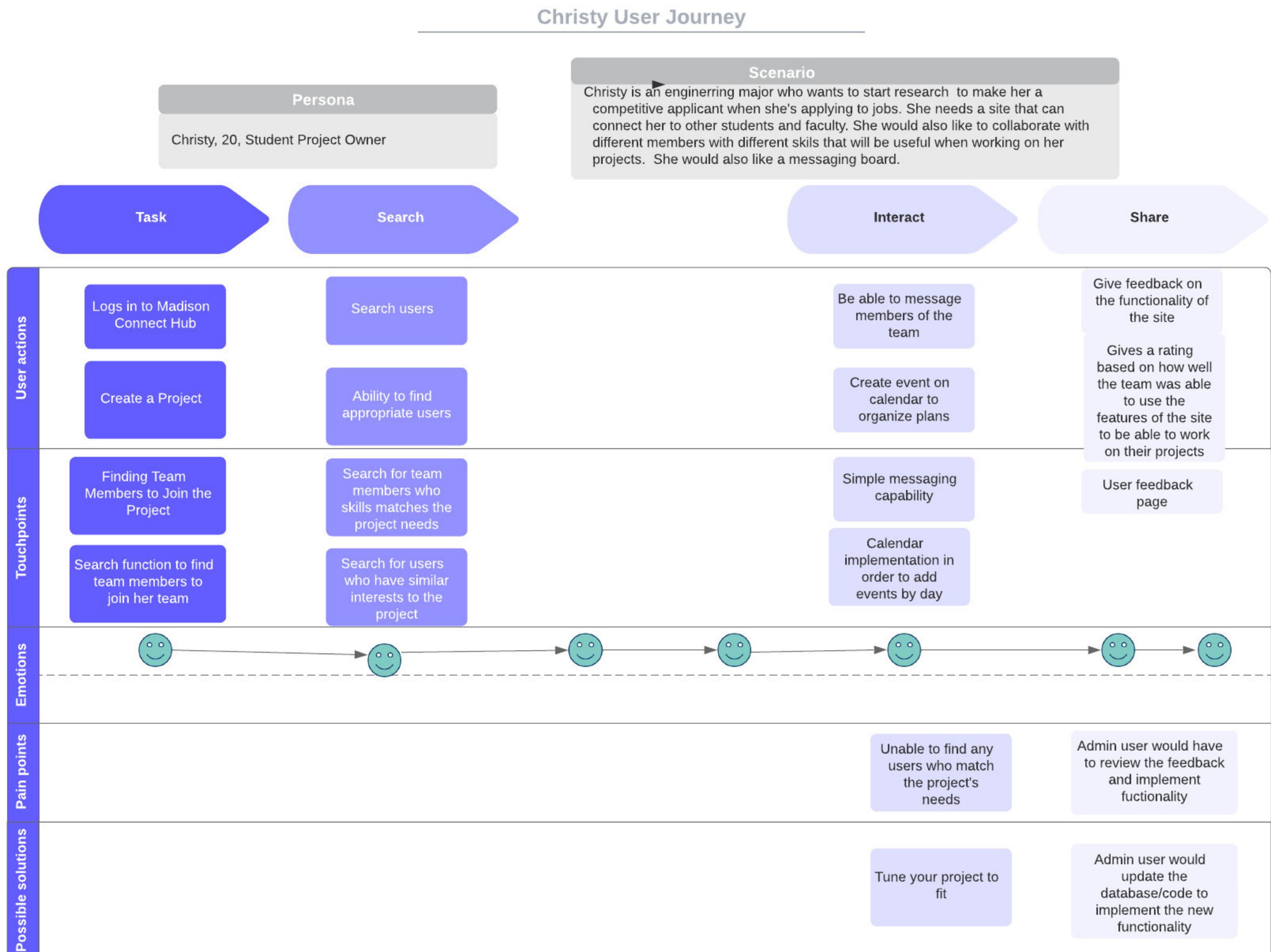
The Flow Diagram above will depict the flow a user takes when using the Madison Connect Hub.

USE CASE



USER FLOW 1

Chrsity

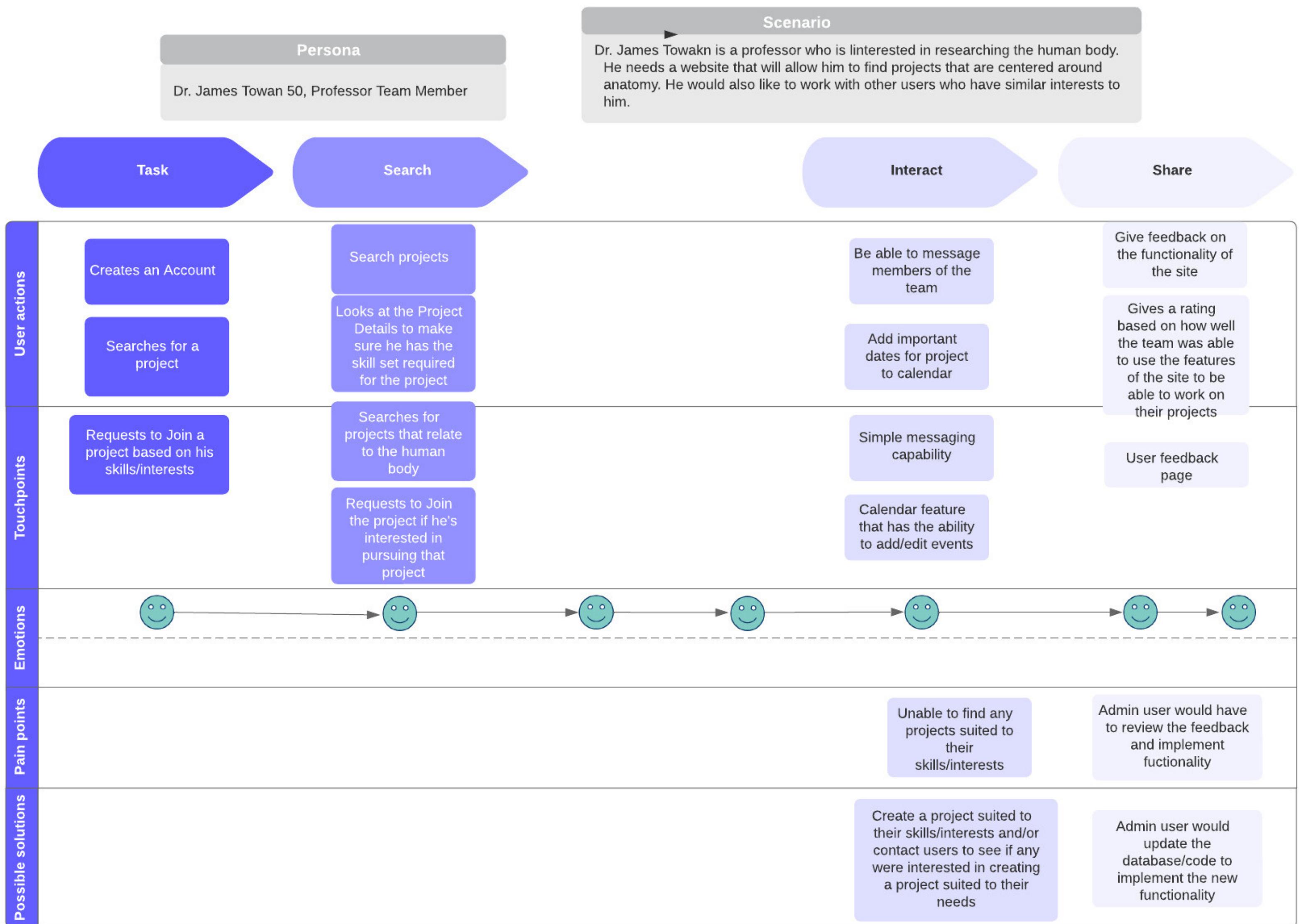


This user flow diagram shows Christy's walk through Madison Connect Hub. Christy's first step is to log in to the website and her second step is to create her project. After she has created her project, she will search for users to join her project as team members. She will also be able to message her team using the messaging functionality that will be implemented. Finally, she and her team will be able to leave feedback about anything that could be fixed about the site.

USER FLOW 2

Dr. Towkan

Dr. James Towakn User Journey



This user flow diagram shows James's walk through Madison Connect Hub. James's first step is to create an account and his second step is to search for a project. After he has searched for a project, he will request to join a project as a team member. He will also be able to message his team using the messaging functionality that will be implemented. Finally, he, the project owner, and the rest of the project team will be able to leave feedback about anything that could be fixed about the site.

USER TESTING

Tasks

1. Log in to the website
 - a. Start on the home page
 - b. Select “login” on the home page or nav bar
 - c. Click “login” after entering information
 - i. Username: ab1@jmu.edu
 - ii. Password: dukes
2. Add Skills to your profile
 - a. Go to the “profile” page
 - b. Select the edit
 - c. Select skills from drop down to add to page
3. Invite someone to your project that has the desired skill
 - a. Go to the “people” page
 - b. Select the user you want to add
 - c. Select the add button
 - d. Choose the project to add them to
4. Join a project - SET PROJECTS
 - a. Melody project
 - b. Learning HTML/CSS
 - c. AR/VR for learning
 - d. SMAD Checklist Redesign
 - e. Go to the projects page
 - f. Browse the projects and select the project we tell you to join
 - g. Open the project details
 - h. Request to join the project
5. Send someone a Message
 - a. Go to the message center
 - b. Select a conversation thread WITH SOMEONE
 - c. Compose a message
 - d. Send the message
6. Create an Event
 - a. Go to “availability/calendar page
 - b. Click “add event” fill out event info
 - c. Click submit

USER TESTING

Briefing and Questions

Briefing:

Hi! My name is ___ and I would like to present a website prototype that my team has been working on for our Senior Capstone. This project is to redesign the Madison Connect Hub. The goal of the Madison Connect Hub is to connect JMU students and faculty to work on projects together. During this session, we will have you complete a series of tasks on the website. Please speak aloud your thoughts as you navigate our site.

Pre-Session Questions:

1. If you are a student, what is your graduation year?
2. If you are a professor, how long have you been at JMU?
3. How often do you use social media?
4. Do you work on research projects in your free time?
5. What websites do you use on a regular basis?
6. Have you ever used a similar product to the Madison Connect Hub?

Exit Questions:

1. What features did you find most valuable and why?
2. What prevented you from completing a certain task?
3. How difficult are these test assignments?
4. How would you describe your overall experience with this product?
5. If you could change one thing in this product, what would it be and why?
6. What do you expect to see in our product in the future?

USER TESTING

System Usability Score:

On a scale of 1-5, how much do you agree with the following statements?

1 - strongly disagree

2 - disagree

3 - neither agree nor disagree

4 - agree

5 - strongly agree

1. I think that I would like to use this system frequently
2. I found the system unnecessarily complex
3. I thought the system was easy to use
4. I think that I would need the support of a technical person to be able to use this system
5. I found the various functions in this system were well integrated
6. I thought there was too much inconsistency in this system
7. I would imagine that most people would learn to use the system very quickly
8. I found the system very cumbersome to use
9. I felt very confident using the system
10. I needed to learn a lot of things before I could get going with this system

Calculated SUS Score: 87.81

NEXT STEPS

Add more accessibility feature

In order for the website to be used by more people, implementing accessibility features will help with that. For example, the website should be able to move around via keyboard, the text on the screen should be resizable, and the ability to change from dark and night mode.

Send email notifications when a message is received

When a user receives a message they are not notified outside of the website. In order to keep the user to keep coming back to the website, notifications, when a message is received, are critical. It will help to increase user retention, and help with team formation.

Link the calendar to Outlook and Gmail

Linking the calendar feature with Outlook or Gmail will help by making the scheduling process much easier. It will allow project owners and teams to set up meetings faster therefore helping with the overall progression of the project.

Allow alumni to join the site for more mentors

Alumni could be a critical piece in helping current students at their university. They will provide different insights compared to the faculty and staff, and will bring in more insight for the students on the website.