

Student Life Plus App
by
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ABSTRACT

Student Life Plus seeks to give students more of a voice and improve the visibility of issues that everyday students encounter. We believe that by partnering our app with UC Student Government, we hope to provide meaningful improvements across the campus. The University of Cincinnati's current system does not provide nearly enough visibility into how the student body as a whole feels about a topic. Our application will provide a forum-like outlet for students to voice concerns and suggest improvements by making posts, reviewing current issues, and engaging in discussions related to current topics or issues via reading posts from peers and Student Government.

1. INTRODUCTION

1.1 Introduction

Throughout our groups time here at the University of Cincinnati we were often unsure how the University's Student Government operates and how to make meaningful change around campus, which is why we decided to pursue the development of our web application "Student Life Plus". We hope that our application will help to expand the voices of students and increase visibility behind on going issues throughout campus. SLP allows you to not only share your thoughts, express opinions, but also show support for your fellow Bearcats and their posts. Any change you can think of to improve life as a college student can be posted on our Platform and viewed by your fellow students and Student Government members. After the post is published it can be upvoted by your peers in order to have the best chance of "gaining traction" within the student government.

1.2 Problem

Students spend a lot of time around their college's campus and software while attending a university such as the University of Cincinnati. This being said, we think the ability for students to bring issues to mind regarding campus infrastructure to the attention of student government is an important tool for both students and the university. When referring to campus infrastructure, this encompasses physical property, software/websites, and university policies. The core of our problem is there is a lack of ability for students to easily voice their concerns about issues that they see on campus and for those concerns to be seen by the right people to solve them. Being that the students are the everyday users of the university's infrastructure they are the perfect

minds to pick for the university to determine what needs to be fixed around campus and at what urgency.

1.3 Solution

Our solution to the previously stated problem is to create a web application to provide a place where students can describe a problem they have with anything regarding the university's infrastructure and post it to a forum. On this forum students can see each other's posts and up vote them if they are in agreement. The up voting system helps post to be seen by student government and helps aid the university in deciding what problems to rectify first. We would also give the student government the ability to make posts giving updates on steps they are taking towards fixing the students problems. We feel this communication between the end users (students) and the university will be both beneficial to campus life and the ability of the university to direct its resources towards the right places.

1.4 Project Goals

The goal of this web application is to create communication between students and student government on issues regarding campus issues and what is being done about those issues. We want to give students a voice regarding their campus and help the university decide where to focus its resources.

1.5 Overview

Throughout this final report, there will be information on how the project was completed. The report includes in-depth processes and includes the following sections: design objectives, methodology, budget, timeline, problems encountered, and future recommendations.

2. DISCUSSION

2.1 Project Concept

The idea of this project came from our group's struggle to pinpoint a suitable project for senior design. We as a group searched for common issues stemming from UC and the students. It was hard to find one singular issue to pursue and build a solution for, so we thought what if we had a way of viewing all the issues people have with the campus currently? From there we have been working hard to create a platform where Bearcats can voice their opinions and where the UC Student Government can effectively communicate with students.

2.2 Design Objectives

Some major features and goals that that we wanted to include in the project include:

- A feature to allow students to post their concerns regarding issues they are experiencing with campus infrastructure to a forum where student government can view them
 - o Allow students to voice their concerns to the appropriate audience
- The ability for other students to witness their peers posts and upvote them
 - o Allow the most pressing issues that impacts the greatest number of students to gain the attention of student government
- A feature that allows student government to make posts giving updates on the issues that are currently being solved
 - o This allows students to see that their concerns are being heard and attended to, making them more enthusiastic to get involved with improving campus life
- A feature that allows users to comment on each others posts

- o This allows students and student government to give detailed feedback on each others posts and furthers productive discussion

There were several non-major features that we abandoned because of time constraints; these include the following: file/picture uploads, pagination, sorting and searching, and an option to post anonymously.

2.3 Methodology and Technical Approach

Web Application

University of Cincinnati Student Government(UCSG) currently does not operate any web source for the real-time dissemination of information to the student body and the students do not have a reliable method or platform to interact with the UCSG. The primary goal of our project is to increase the visibility of all ongoing issues around campus and to provide a platform for students to voice issues that matter to them.

Database

We as a group made the decision to use Azure hosting for the database to provide scalability and minimize costs using student credits. Having the database hosted allowed all developers working on the project to use the same replicated data and maintain a standardization across the application. The database tracks the submitted issues and associates them with a user's 6+2 id. This allows UC students to easily access the application and provide new submissions and express support for existing issues.

2.4 User Profile

Project

Student Life Plus

Potential Users**POTENTIAL USERS- More Frequent Use:**

- Any student at the University of Cincinnati
- University of Cincinnati Government members
- Any student ran club or group at the University of Cincinnati
- Bearcat students who see needs for improvement

POTENTIAL USERS- Less Frequent Use:

- UC Alumni or Alumnae (less frequent because of age considerations)

Software, Interface, and Related Experience

The user should have experience using the internet and forum/social media type web applications.

Experience with Similar Applications

Users may have experience with similar web applications such as Google Chrome, Safari, FireFox, Internet Explorer, Facebook, Reddit, and Twitter

Task Experience

Basic web page interactions – using the mouse and keyboard to navigate areas on the web page, create user profiles, and enter information into submission fields (including uploading a picture via a computer).

Frequency of Use

Whenever a UC student or university group feels the need to communicate an issue to the student government or when the student government needs to provide updates to students or university groups. This could be constantly, daily, weekly, ect.

Key Project Design Requirements that the Profile Suggests

- Visually appealing, clean flow, and easily understood and navigable UI
- Ability to have anonymity if the circumstance requires it
- Ability to moderate posts for UC Student Government members
- A web application forum accessible by all UC students
- Compliance with University ethics standards
- A chance to appeal if your posts is removed by moderators
- Terms of Service to prevent abusing or harming others
- Admin privileges for project creators as well as UC Student Government members

2.5 Use Case Diagram

Figure 1: Use Case Diagram The following diagram, Figure 1, demonstrates the use case for Campus Life Improvement App. The diagram shows all possible users with corresponding tasks.

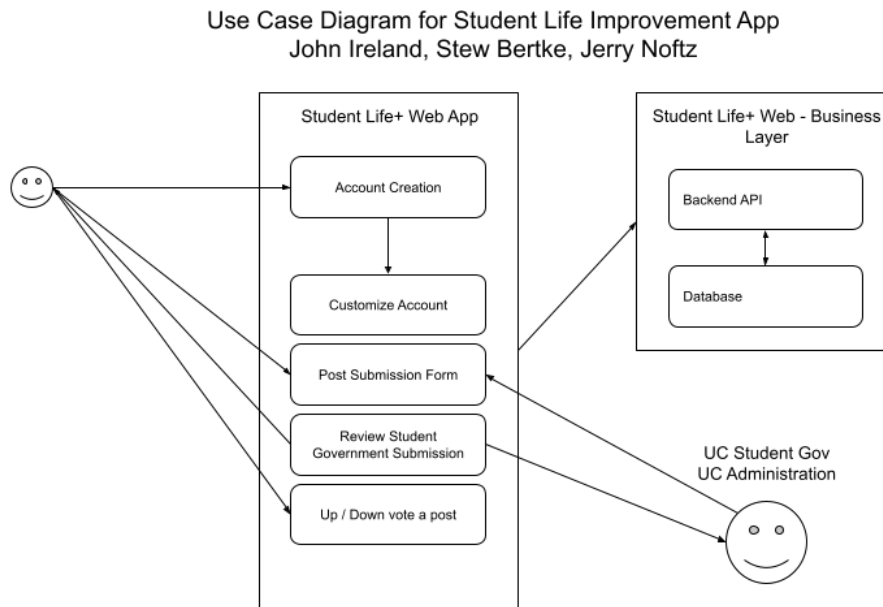


Figure 1: Use Case Diagram

2.6 Technical Architecture

Our team strategically selected the technologies we would use for our project. These technologies cover the Web App, Database, and Hosting Services. This explains the reasoning behind our technical architecture.

Web App

The architecture of the website is built using JavaScript. The front end is React and the backend is Express Node JS. Our decision to use this stack was based on our knowledge of the technology. We all had some experience with NodeJS which was a guiding factor in our decision to use Express for our backend. And although not all of us had experience with React we decided to use it so that we have the same language across the front and back ends of our web application.

Database

The database is being built using Azure Cloud Platform. Azure offers a \$300 free credit to get started with any product. Azure also offers a free tier on some of its database products. We are using the Azure SQL server service for the database. The database is designed to satisfy the normal form and stored procedures were set up for insert functions.

Hosting Service

We have not put the app on a cloud service because the login system uses the University of Cincinnati Active Directory to authenticate users and to utilise the active directory we need to use Cisco's AnyConnect VPN or have the app hosted internally on UC's network. Until the app is handed off to the student government we will demonstrate it running locally using a VPN.

Estimated Cost Rough Order of Magnitude:							
	Rate Per/Hr	Work Effort (Hours)	1 X Costs	Ongoing Annual			Comments:
				Rate Per/Hr	Work Effort (Hours)	1 X Support Cost	
Labor - IT	20	200	\$ 4,000.00	20	10	\$ 200.00	
Labor - External			\$ -		0	\$ -	
Software - External						\$ -	
Hardware - External							
Misc.							
Domain Hosting						\$ 15.00	
Azure DB Hosting						\$ 60.00	
Site Hosting						\$ 175.00	
TOTAL			\$ 4,000.00			\$ 450.00	
5-Year ROI Analysis							
Description	5- Year Expected		Conservative (1.5)				
Total Costs	\$	6,250.00	\$	9,375.00			
Total Benefit	\$	-	\$	0			
Total Costs/Benefit Differential	\$	(6,250.00)					
Conservative Costs/Benefit Differential	\$	(9,375.00)					

Table 1: Project Budget

Project Name:	Student Life	Project Manager:	Jerry Nofzt	Team #	20
Project Members:	Jerry Nofzt, Stew Bertke, John Ireland	Project Areas:		Project Advisor:	Yahya Gilany
Problem Statement					
Students spend a lot of time around their college's campus and software while attending a prestigious university such as the University of Cincinnati. This being said, we think the ability for students to bring issues regarding campus infrastructure to the attention of student government is an important tool for both students and the university. When referring to campus infrastructure, this encompasses physical property, software/websites, and university policies. The core of our problem is there is a lack of ability for students to easily voice their concerns about issues that they see on campus and for those concerns to be seen by the right people to fix them. Being that the students are the everyday users of the university's infrastructure they are the perfect minds to pick for the university to determine what needs to be fixed around campus and at what urgency.					
Project Description					
Our solution to the above stated problem is to create a web application to provide a place where students can describe a problem they have with anything regarding the university's infrastructure and post it to a forum. On this forum students can see each other's posts and up vote them if they are in agreement. The up voting system helps post get seen by student government and helps aid the university in deciding what problems to tackle first. We would also give the student government the ability to make posts giving updates on steps they are taking towards fixing the students problems. We feel this communication between the end users (students) and the university will be both beneficial to campus life and the ability of the university to direct its resources towards the right places.					

Project Asset Type					Funding Source (if applicable)				
Select One ▼ Comments: This app will improve the overall quality of student life on campus.					Select One ▼ Comments:				
Risk Identification (See Risk Types tab)					Project Stakeholder(s)				
	<i>Risk Rating* 1-5 (5 is high)</i>	<i>Comments</i>	<i>Weight</i>	<i>Score</i>	Students, UC Student Gov, UC Administration				
Work Effort (days)	▼		40%	0.00					
Complexity	▼		60%	0.00					
Project Risk Score:				0.00					
Estimate of Benefits									
If project will generate revenue, estimate 1 year here:									
Select other benefits the project may bring a customer or									
Risk Avoidance		☐							
Improved customer satisfaction		☒							
Increased system availability		☐							
Productivity or process		☒							
Reduced costs		☐							
Estimated Cost Rough Order of Magnitude:									
	Rate Per/Hr	Work Effort (Hours)	1 X Costs	Ongoing Annual			Comments:		
				Rate Per/Hr	Work Effort (Hours)	1 X Support Cost			
Labor - IT	20 ▼	400	\$ 8,000.00	20 ▼	10	\$ 200.00			
Labor - External			\$ -		0	\$ -			
Software - External	▼					\$ -			
Hardware - External	▼					\$ 15.00			
Misc.	▼					\$ 15.00			
Domain Hosting	▼					\$ 60.00			
Azure DB Hosting	▼					\$ 175.00			
Site Hosting	▼								
TOTAL			\$ 8,000.00			\$ 465.00			
5-Year ROI Analysis									
	5- Year Expected		Conservative (1.5)						
Description									
Total Costs	\$	10,325.00	\$	15,487.50					
Total Benefit	\$	-	\$	\$0					
Total Costs/Benefit Differential	\$	(10,325.00)							
Conservative Costs/Benefit Differential	\$	(15,487.50)							

Table 2: Final Project Budget

2.8 Project Timeline

Figure 2: Project Timeline The following diagram, Figure 2, shows the Timeline for the Campus Life Improvement App . The Timeline shows the project schedule for fall and spring semester.

Task #	Task Name	Duration	Start Date	End Date
1	Project Scope	1 Month	08/31/2020	09/30/2020
2	Dev Env Setup	2 Weeks	10/01/2020	10/16/2020
3	Database Design	1 Month	10/16/2020	11/16/2020
4	API Calls	2 Weeks	11/16/2020	11/30/2020
5	Frontend Design	2 Weeks	12/01/2020	12/14/2020
6	Login Portal	1 Month	12/14/2020	01/15/2021
7	Admin Portal	2 Weeks	01/15/2021	01/29/2021
8	MVP Review	1 Week	01/29/2021	02/05/2021
9	Bug/Error Testing	3 Weeks	02/05/2021	02/26/2021
10	Finalize Hosting Configuration	1 Week	02/26/2021	03/05/2021
11	Frontend Clean-up Finalization	2 Weeks	03/05/2021	03/19/2021
12	Full Application Testing	2 Weeks	03/19/2021	04/02/2021
13	Final Report	1 Week	04/02/2021	04/09/2021
14	Oral Presentation	1 Week	04/05/2021	04/12/2021
15	Tech Expo	2 Weeks	04/02/2021	04/13/2021

Figure 2: Project Timeline

2.9 Problems Encountered and Analysis of Problems Solved

One problem that we encountered was time management. We had the project planned out on a timeline but we did not take into consideration that some things had to be done before others

in order to have a beta version of the product in a timely manner that could be shown to users. This led to us having to put a rush on a beta version, we were able to accomplish this with little issues.

Another problem that we encountered was our lack of prior technical knowledge with MongoDB coupled with our time constraints that caused us to have to make a switch to using a SQL database instead since we already had prior knowledge with using it.

The biggest problem we ran into was the lack of programming knowledge in most of our group members. This made it a challenge to complete tasks in a timely manner, despite this challenge we succeeded in completing the main objectives of the application but several features that we would have liked to add got scrapped because of time constraints.

2.10 Future Recommendations/Recommendations for Improvement

User Profiles

The application will need to track and allow some basic configuration for users. This will help improve the user experience and the overall growth of the site. With more users we will be able to support more issues and have a large sample size of what is important to students.

Data Scraping

The ingestion of other data from around the campus will help with centralizing information that matters to students and also aid in locating issues or other pain points around

campus. We hope to make Student Life+ a central hub for information and change around campus over time.

Open Source the project

Allowing the application to adopt an open source structure will help with the overall maintenance and progress. With the site being driven by users input we need to containly insure that we have disarrerable features implemented. Allowing students to work on the application will lead (quality and longevity of the site)

PWA

(Progressive Web Apps) PWA is the future for most sites with the large majority of users relying on smartphones and tablets. Reworking the site to support a PWA will allow students to input suggestions while out on campus rather than having to wait to access a computer.

3. CONCLUSION

3.1 Lessons Learned

Throughout this project, we have learned a lot about implementing programming features in a way that they work well with each other as a complete unit. We learned a lot about what goes into making a web application including; database functionality, separating frontend / backend workloads, working with data, and the usage of hosting services. We also learned about the importance of meticulous planning when partaking in a large project with a large timeline.

3.2 Abilities and Skills Developed Throughout Project

The majority of the group came into this project with little programming knowledge. Throughout this project we have developed Javascript skills using React and Express. This project has also helped us develop our time management and project management skills. We also exposed ourselves to Azure SQL database hosting and database management, as well as using an SQL database to support a web application. These are going to be extremely important skills to have throughout our careers.

REFERENCES AND APPENDIX

4.1 References

Azure SQL Databases. *Microsoft Azure*, Microsoft
<https://azure.microsoft.com/en-us/free/sql-database/>