

Theta Tau Theta Gamma Capstone Final Report

Honors Capstone WN23:

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INTRODUCTION

Theta Tau, Theta Gamma Chapter is a long established co-ed engineering fraternity at University of Michigan. Theta Tau aims to develop a close bond between motivated engineering students across all disciplines in addition to public service, events for University of Michigan students, and networking for members of the fraternity. Theta Tau regularly hosts various professional development events open to all engineering students and assists in the Engineering Career Fair each year.

Like most student organizations, Theta Tau relies on the recruitment of new members, involvement of current fraternity brothers, and maintaining engagement of alumni members after graduation. Most student organizations use events such as Festifall, flyers, and word of mouth however sometimes lack an online presence. Most online presence for student organizations is through Maize Pages, University of Michigan's hub for student organization postings. While Maize Pages is an excellent community board for the list of potential student organizations, most student organizations have little information about the organization on Maize Pages. Typically this information is limited to a short paragraph about what the student organization does and how to contact them, which usually takes the form of "Join Our Mailing List" or "email us at: ". This method works, however it is often not as engaging as a student organization website that allows more information to be shared than simple emails. Student organization websites are a great way for groups to stand out from other organizations, attract more new members, raise sponsor funding (if that organization is something like a project team), retain member involvement, and encourage alumni communication.

Student organization websites allow students to showcase their organization however they see fit, can serve as a central area for the organization to share projects, connect, share events, and allow alumni to maintain awareness of the organization far after they graduate.

Theta Tau Theta Gamma has long had a website built by the very own brothers within it. Designing and implementing the website has long been the responsibility of brothers that are proficient in Computer Science (and typically taken EECS 485: Web Development). Due to the barrier for entry being so high, most brothers do not ever get involved in maintaining the website

- leaving the responsibility to older brothers, most of which are typically seniors that are busy with other work or lack the timeline to effectively work on the website. As a result, the current Theta Tau Theta Gamma website had gone years without much maintenance or development, leaving poorly documented code that no current member could easily work on without significant effort to understand and/or rewrite the current code. Additionally, the barrier to entry for working on the website often excluded younger members that don't have skills in web development yet were very eager to learn and contribute.

These factors are what inspired the creation of this Honors Capstone: to create a brand new website that was written in a scalable and maintainable way along with thorough documentation of design decisions, development, learnings, and how-tos. This project is aimed to allow all brothers interested in website creation to contribute, regardless of major or year. While some parts of website creation are inherently more complex than others, different majors would likely contribute different items - however the main goal to increase website inclusivity still remains. In particular, the project documentation aims to educate all members with familiarity in computer science (all years, optimally either major or minor in computer science) in a way that allows contribution to the website.

The project also aims to encourage participation outside of writing source code, such as development of high level visual designs for the website using Figma. Thus, any member of the fraternity could easily mock up an idea for a feature of the website without needing to code - leading to further accessibility and inclusivity in website creation.

Outside of developing this website for Theta Gamma, we also aim to provide open source code, documentation, and workshops to other student organizations to aid in the development of their own websites, which is aimed to elevate all student organizations at the University of Michigan.

PROBLEM STATEMENT

The main problem our project was trying to solve was the lack of maintenance in the Theta Tau Theta Gamma's website. While trying to solve this narrowed down scope, we were really looking for the problem of maintenance of student organization's websites in general. Theta Tau Theta Gamma, like many other student organizations, face the obstacle of keeping their website up to date for external users who would like to be updated - alumni, other chapters, prospective members, and more. Before we could address the problem at hand, we had to focus on validating that this problem existed, and figure out the cause of the problem.

Upon creation of our project, we hypothesized that the cause of this problem is the barrier of entry being so high. Theta Tau Theta Gamma's website, along with many other clubs, create their own website. In order to work on a website like this, most students need a reasonably high

education level in Computer Science, specifically EECS 485: Website Development, a junior to senior level Computer Science course. This need for an extremely hard class to add small details to a website makes it hard for students to keep their websites up to date. Furthermore, the members that have more time to work on the website and have closer connections to prospective members are unable to update the website due to this obstacle.

To test both our problem and hypothesis, we began by addressing the foundations of the website - who, what, where, when, why, how? In more detail, who used the website? What kind of website did these users want? When did they want an updated website? Why did they want an updated website? And how would they like this website to function and look? These questions helped us find out if websites really needed to be maintained, and if this maintenance was happening. When maintenance was happening, who was responsible for it and how were they able to accomplish this.

After validating the problem existed and the cause of the problem was directly related to the accessibility to the website, the problems we were trying to solve shifted to how to solve our problem. Now that we understand there is in fact a problem and that the problem is caused by the lack of understanding of younger students, how can we make the website more understandable and editable by younger members of student organizations? In what ways would students be receptive to helping out on the website and how would they be able to learn how to work on it? When solving these problems it was important to address every avenue that could be possible and not bring personal opinion in the future course of actions. For example, if younger students are unable to edit the website and they want to keep the website maintained, they could even outsource their website maintenance to a third party company. We brought a variety of options to the table, and continued to conduct market research on these options. We talked to existing members, prospective members, and alumni, the three largest categories of users, to narrow down our options and find a solution.

Our market research indicated that existing members indeed thought that a website would be valuable, and did further investigation on website components that are desirable. From our participants, 100% believed a website would be helpful for centralizing information, connecting with alumni, and providing information about the fraternity. A majority of participants desired a family tree, alumni map, committee descriptions, an alumni login, and a mobile login. As for website maintenance, 94% of participants prefer that brothers maintain the website through one of our committees as opposed to outsourcing a company to do so. This market research validated that the website would be useful among our members, the features that members wanted, and the way the website should be maintained.

METHODS

Market Research

We began our project by validating our project and ensuring that members of Theta Tau would actually want a website. To do so, we compiled a Google Form with some of our most important questions regarding the features and maintenance. Our questions were as follows:

1. What is your affiliation with Theta Tau?
2. Do you think a Theta Tau website would be helpful?
3. Who do you think a Theta Tau website would be most beneficial for?
4. What do you think the sole purpose of the website should be?
5. How do you recommend to upkeep the website?
6. Do you have any ideas for website maintenance if we decide to do it through the web committee of the fraternity? Ideas we've had: very detailed transition reports, step by step outline of how to edit the site, workshops each semester teaching how to edit the website
7. Please review the website to review the features that have already been implemented:
8. <https://thetatau-umich.org/> What additional features would you like to see on the website?
9. Is there anything you would not want to see on the website?

The first Google form we sent out received 12 responses after multiple reminders to complete it. We did not think 12 responses was representative of the entire fraternity, so we looked for other options to gauge our market research.

Our advisor recommended a platform called Menti, which is a live, interactive polling platform that gives real time responses. Unfortunately, the free trial was very limited, and we could not complete our market research to the extent we desired. It does look like a good platform to gauge opinions in real time, so we hope that the university invests in the platform in the future to give free access to students.

After an unsuccessful Menti attempt, we decided to resort to another Google form, but rather than sending it through multiple Slack channels, we presented it at one of our chapters and asked brothers to complete it on the spot. The form contained the same 9 questions and took no more than a couple of minutes to complete; on this attempt, we obtained 35 responses, which is roughly half of our fraternity. We decided to use these results considering these 35 brothers are likely the most active and care the most about the website, and since half of the fraternity desires the website with the suggested features, we decided to pursue it.

After completing our market research and collecting as many responses as possible, we validated the results by compiling the data and confirming it at one of our chapter meetings.

Market Research Results

After completing and validating our market research, we acquired the following data from 35 participants:

- 100% believed a website be helpful for centralizing information, connecting with alum, and providing information about the fraternity
- 94% desire a family tree
- 80% desire an alumni map
- 68% desire committee descriptions
- 62% desire an alumni login
- 62% desire a mobile login
- 94% prefer that brothers maintain the website, as opposed to outsourcing a company

We used this data in our design and development process for the Figma and website going forward. Asking brothers to fill out the form on the spot resulted in 3x the responses than sending it through our Slack channel.

Figma

The next step of the process was creating a Figma for the website. Figma is a collaborative design platform that allows users to create a prototype or outline for a website before starting the coding process. Creating a Figma is an iterative process to the project; our initial Figma is continually changing based on new features added and after receiving feedback on the website. Figma is also important to ensure that the developers are on the same page and agree on how the website should look before starting the code for a productive, smooth coding process.



THETA TAU THETA GAMMA

More than a fraternity, we are a [family, brotherhood..]



Theta Tau is Professional Engineering Fraternity. As a group, we are dedicated to the professional and social development of our members into professionals that will enter the industry as strong, contributing members. Our chapter is known as Theta Gamma Chapter and is one of the largest chapters in the Country.

Theta Tau is made up of smart, driven engineers who come from a diverse range of backgrounds and majors. Our chapter holds events weekly designed to instill a brotherhood among our members and develop ourselves as well as our college and University.

Figure 1: A snippet of the Figma design. This skeleton mockup ensures unity on website design, and creates a productive coding environment

Code

After designing our Figma, we had to turn our designs into tangible code. While in the planning stage, the importance of how we implemented our code was very important. Student organizations need to utilize a coding platform that is commonly used and can be transitioned down many years. We discovered that the Theta Tau website used to be written in PHP, a coding language that hasn't been taught by Michigan and not a commonly used language. Because of this, Theta Tau quickly lost the ability to continue to improve and add to their website. As the older brothers who designed the website graduated, there was no one to take over the website and continue to improve it. The website, in turn, became very outdated. For guidance, we looked toward EECS 485: Web Development for how to implement our website. It is important for us to choose coding languages and a full stack that is taught by Michigan so it can continue to be transitioned down the years. We chose React and tried to utilize Bootstrap to style the website.

During the planning and coding process, it was important to get younger brothers involved with the website and generate interest in passing it down to future generations. While they learned the

full stack and we worked with them to develop their code, they helped us be initial testers towards our capstone project. Every time they ran into an obstacle, we ensured we wrote down how to help fix them for the future. When they were learning new concepts, we tried our best to hand them the first iterations of our project to see how helpful it can be.

To develop the website, we broke the website down into puzzle pieces. There was a Home, Brothers, and Rush component. This is the skeleton of the website. Once we got the basics of the website that were needed by the market research accomplished, brothers in the future can add more detailed features as it expands. While creating the components we wanted to create features that allowed for non CS Majors to update the website.

The Home page was created as a landing page. It contains an abstract about the reasons behind Theta Tau and what we hope to accomplish. It contains a lot of images highlighting our organization's pillars: Brotherhood, Professional Development, and Philanthropy. We aimed to keep our home page simple. For future semesters, brothers just need to update the images on the homepage by dragging and dropping new images into the images folder of the github. This allows for non Computer Science students to be able to market new events put together by Theta Tau.

The Brother's page's goal was to accomplish transparency between alumni and current brothers. This page gives more specific details about the brotherhood's committees and events. This allows for alumni to contact current committee members if they want to get involved or understand what is happening to this day at the University of Michigan.

The Rush page aims to help the last big target market in our discovery: potential new members. The Rush page gives statistics on frequently asked questions by people who wish to join the organization and the schedule of the current Rush term's events. Just like the Home page, this page will change quite often as there is a new Rush schedule every semester. Therefore, we placed the Rush schedule for every semester as an image. Every semester the head of rush just needs to send in a new image of the Rush schedule and a new form for potential new members to fill out.

Documentation

Once choosing a stack, the next most important aspect was developing documentation for future brothers to be able to edit the website. With the help of our advisor, Professor Barger, we decided creating a documentation handbook that can be passed down is really important to this project. There is no reason to create a very useful website for the current brothers if the benefits can't continue to be used by future generations. To create our documentation, we broke down the website into large categories: version control, Figma, HTML, CSS, React, and the current

website structure. Through each category, we focused on explaining how to set up your laptop, how that part pertains to the website, and how to edit it and code in it.

Theta Tau Theta Gamma Website Documentation

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ABSTRACT

This document serves to record and teach other brothers of Theta Tau Theta Gamma about how the website is structured so that it can be updated throughout the years without direct reliance on the subset of the brothers with web development experience. This document will be an attempt to explain everything involved in the website and will also include additional links to external documentation that might be of aid to the reader. This document might also abstract some of the

Figure 2: Above is a picture of the documentation provided to the fraternity to help transition future brothers on developing the website

Workshops

Given that the three people working on this capstone project are graduating, we wanted to help create immediate change within our fraternity. We, also, wanted to give a more hands on approach to learning the material provided in the documentation. Teaching people how to edit the website by doing and providing pictures was another way of helping them understand how to create the best website. For our capstone, we decided to provide a slideshow presentation about how to create a website and what we decided for the Theta Tau Theta Gamma website and why. To add on to the workshop, we hosted a workshop that gave all attendees the opportunity to directly impact the website and watch their changes happen in real time.

Tech Stack

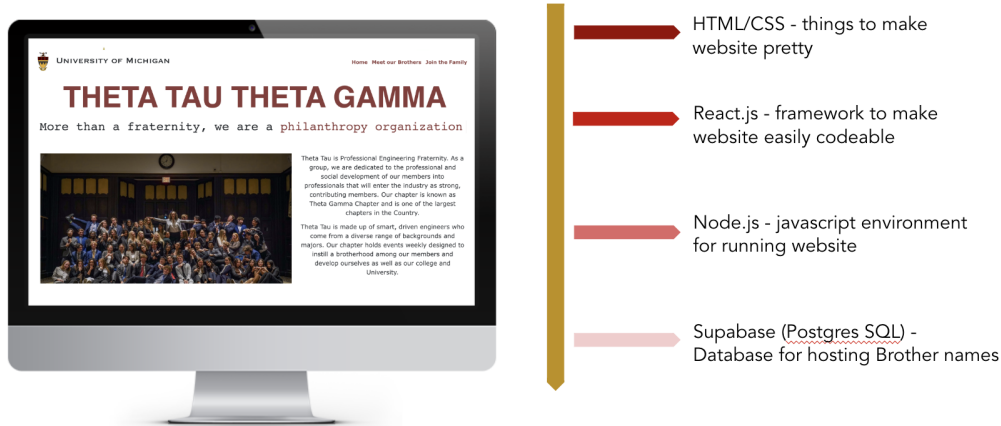


Figure 3: Above is an example of a slide provided in the workshop highlighting the stack of technical languages used in the website.

Handbook

The final large aspect of our capstone project's lasting impact was providing substantial learning devices to those outside of our fraternity. To accomplish this task, we decided to create a handbook and provide the workshop and slides to others as well. Our goal with this capstone was to learn about the best way to develop a student organization's website, and learn how to market our websites to its members and external members. These learnings can help other student organizations outside of Theta Tau Theta Gamma. Because of this, we decided to make a handbook that can be shared with all student organizations to help develop their websites internally over the years.

DISCUSSION AND CONCLUSIONS

Key Takeaways

A couple key takeaways from this project were understanding the importance of validating results and understanding how to communicate with others that have skill sets different from your own. First and foremost, the basis of this capstone project was our website; our website has not been very successful in the past, so we began wondering if it was necessary to begin with. However, after following the advice of our advisor and conducting market research, we validated that the website was indeed something that the fraternity wanted, which gave this project meaningful ground. Next, we learned the importance of communicating with other people that

have different skill sets. The individuals coding the website had a strong knowledge of computer science and understood the difficulty of implementing certain features. However, not everyone in the fraternity has this same understanding of computer science; these individuals may not understand the feasibility of implementing certain features, but communicating the difficulty behind some tasks helped us prioritize and implement features accordingly.

Challenges Encountered

The biggest challenge we anticipated to overcome is understanding how to make our website sustainable for the future. This required a large amount of overlap of design, understanding users, technical skills, and communication. We also considered outsourcing a company to update the website, but this was not a popular consideration amongst our brothers, who prefer to maintain the website internally.

Recommendations

Our biggest recommendation from this project is to communicate as much as possible with the people that want the product you are offering. In this instance, the brothers of our fraternity wanted a website, so it was important to make a website that the brotherhood envisioned as opposed to only us team members. This involved market research, where we had quantifiable data to represent what individual brothers wanted on the website. Qualitative data can be helpful in generating ideas for the website, but in the end, qualitative data helps with validating the ideas for the website and prioritizing which ones to complete first. For example, many people wanted a family tree feature on the website, and this was supported by the data from our market research. We were also hearing ideas about an alumni login, but this did not prove to be as popular, so we prioritized the family tree as an action item. Using quantitative data as a rationale to the decision making in the project was very helpful, and this general theme can be applied to many different projects across different industries.