**Saint Martin’s University**

**ASSMU Club Information System**

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**Summary of the Project**

The main purpose of the project was to develop a club information system for students. The current club system provides little to no information about each club. Clubs on the website are very outdated and some clubs are no longer provided at SMU. With the new system, students will have easier access to clubs and club leads will be able to instantly update any information and have it shown. Having this system allows students to meet new people that have common interests with them. ASSMU Executive Club Coordinator, Shaina Agonoy-Pascua, is our client and we built the project around our client’s needs. Our client requested for quick access to critical information such as clubs, events, ASSMU officers, calendars, resources, and a contact page. Also, our client requested that this will be separate from the SMU website and will be publicized by ASSMU and Campus Life.

**Functional Requirements**

Our project needed to provide a quick and user friendly system that allows students to find information about clubs at Saint Martin’s University. It was necessary that it ran fast and efficiently, as the website may contain an amount of users accessing the site. The clubs portion provided the club photo, description, and officers. Our event tabs consist of all club events and allowed the user to filter by category of what events interest them. Examples such as academics, sports, or recreational activities. The ASSMU officers contained a simple and easy to read page of officers running ASSMU and details about them. It contained their contact information, along with their social media if they had it. The calendar feature was critical in providing a large overview what club events, and lets users see what club events were happening on a given day. One of the biggest issues with the old club system was the lack of forms and resources. The new system fixes this issue by containing all critical forms and information in one tab, such as club creation forms, budget request, and club rules. Lastly, the contact page allows users to contact the ASSMU team or development team with questions or concerns.

**Comparable Systems / Literature Review**

An example of a current existing system with similar functionality could be University of Washington’s RSO page. They contain similar information such as clubs, events, calendars, and resources. What makes ours unique is the ability to not only filter clubs by name, but also in categories. This helps guide students to find clubs that they would not have known existed. Another feature that makes out system unique is the ability to send emails directly to ASSMU or development team, as we use EmailJS to send emails without the need of users logging in with their own email address. Our decision to go with our projects is the ability to alter and change the design to fit our clients needs, as it was requested to have additional information about clubs and events.

**Methodology**

The methodology that was followed was the agile scrum methodology. The agile scrum methodology is a way to get tasks done efficiently and allows for review of what people are working on so far. It includes having a backlog of issues or changes that need to be done, 1-4 week sprint period (sprint periods are time where the team will get all of their work done), and a demo session which is where the team will present what they have been working on and try to give some helpful information. This demo session is used to see if the team is on track to finish the project, for team members to ask for help, or a place to give advice and receive feedback.

We implemented this methodology by using a 2-week sprint cycle and at the end of those 2-week sprint cycles we would gather together as a team and show what work we have done. During this meeting, we would give advice to each other, add more issues to the issue board to be worked on, and assigned tasks to give each other based on knowledge and expertise. Every other sprint cycle, we would go meet with Shania and show her the progress we have made and see if she wanted to make any changes.

Using this cycle really allowed us to get the project done very quickly with little to know problem. It really helped us all as a team to be on the same page.

**Architecture**

Here is a quick look at our architecture, below this will be a more detailed description of each:

* Front-End - React.Js, CSS, HTML, JavaScript
* Mobile Responsiveness - Bootstrap, CSS
* Backend - Node.Js
* Database - Cosmic.Js

Our system included using React.Js as our main framework that will help us create different types of UI designs that are very simple. Using React would allow us to update data right away without having to refresh the page or database. React would handle everything in the front end using CSS, HTML, JavaScript. We also used a lot of CSS mixed in with Bootstrap to handle mobile responsiveness and scales depending on the size of the device.

For the backend portion of our project we used Node.Js. Node.Js allowed us to make our project scalable and be able to connect with the network. Using Node.Js allowed us to create and make REST API calls to our database to get information and then allowed us to send that information to our Front-end (React.Js). If no call is made, Node.Js will just sleep and wake up when the call is made again.

The database we used was Cosmic.Js. Cosmic.Js is a headless CMS. This means that it is very flexible and the components that we make are reusable all throughout the project. This is way better then compared to a regular CMS, which has all the data condensed with the code making it hard to read, and makes it very difficult to reuse components. Cosmic.Js’s data is all in the cloud which allows for the information to be accessed anywhere if you had the password. It also made it easier for us because since it is on the cloud, we did not have to keep a database running constantly while working on the project and made it cheaper because we used the free version of cosmic. Cosmic not only helped us on the database side, but it also makes it easier for the club admin to add or edit clubs whenever they wanted with just a click of a button. To gather data from this cloud database we used Node.Js to create an API that grabs data from Cosmic, put it in a .json, and be able to be grabbed by the front-end using a GET request.

**Evaluation**

We tested the scalability and performance of the system by pulling data from a calendar with a small, to mid, to large amount of events. As we expected, the more Google Calendar events that were present, the slower the performance of the system. Also, each event displayed on the events page contained an image file which significantly decreased performance. To optimize the images we decrease the file size for all of the images.

Other techniques to optimize the system we considered were:

* Delete unnecessary plugins
* Enable browser caching
* Minimize CSS and JavaScript files
* Reduce redirects
* Reduce server response time

React in itself is already geared towards quickly switching between tabs and rarely having to communicate with the server. This is done with the routes tag from the BrowserRouter import. The system only has to communicate with the server once, then all of the redirects are cached, so the system can quickly move between tabs. We also removed plugins that we no longer needed after comparing the performance of similar methods. Most of our CSS is in a single file, and we used JSX (javascript xml) in the React way, where files can be simplified by passing data from a top component down to its lower components in a linear direction.

**Future Work**

To improve on what we accomplished we could use the exact format of SMU web pages onto our system so we could further improve the UX (user experience) based on those changes. There could also be more types of data incorporated into the system so users would have fewer pages to navigate to in order to find similar information.

Another feature that could have been added is having a search bar that is able to search through all of the information on the website. Currently, we only have information searched by whatever page the user is on. This is because data was coming from multiple different sources and it was difficult for us to try and implement a way to search through everything on the project.

There could also be a feature where certain admin users could update the information on the system itself, instead of solely relying on the backend service that is used (Cosmic.Js). This could prove as a useful alternative for those not comfortable or unwilling to learn the backend system. As our system continues to grow, it is important for the project to be scalable. An example would be to create different API calls and request to only obtain specific information, instead of making a pull for all the data at once.

Security features are always improving, and due to our timeline we could not implement some current practices for our system. User data is of utmost importance and it is our responsibility that content on our system does not negatively impact the security of our user’s data. It is also important to consider how certain types of application security risks can decrease the overall performance of the system, which many users do not tolerate in the fast paced environment on the internet today.

**Conclusion**

We are very proud of the work that we did. Creating a project this big with this much information was difficult because we all never worked on something like this before. If we had more time like another semester or another school year to work on this project, I feel that we would have been able to implement everything that we talked about in the future work section. This project has been such a great learning experience by working as a team and implementing what real companies use to gain experience. We learned how to create REST Api’s, learned about responsiveness, reactiveness, database management, and working on a team using Git. We are very proud of this website and hope that ASSMU will consider using this website for the future.