Website Design Beyond Expectations: A Summer of Software Development at CapTech Consulting

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Michael Ackley
Computer Science
The University of Virginia
School of Engineering and Applied Science
Charlottesville, Virginia USA
msa4ac@virginia.edu

ABSTRACT
During my summer internship at CapTech Consulting, I worked as a software developer on a team of 10 interns building a website for an airline company acting as a mock client. Using proper requirement elicitation practices, agile methodology, and front-end development skills, my team and I were able to successfully produce by a strict deadline a website that exceeded the needs and expectations of our client. Our elicitation requirement process began with the use of Figma, a software for user interface design. After discovering all requirements and client preferences, we implemented our design through a React front end with Material UI and a Node JS back end. Through this experience, we learned the importance of communication and daily stand-up meetings, as required in the practice of agile methodology, which made sure that each member of the team was working on incremental changes that could later be integrated with the work of the rest of the group. We successfully demonstrated our website to the client, which acknowledged that it exceeded expectations.

1. INTRODUCTION

How can a failing airline overcome their negative reputation and compete against industry leaders all through a new web front end? Creating this new web front end would be the challenge that my team and I were tasked with and given no more than ten weeks to complete.

The new web front end we were working to create would be the source of all bookings through the airline, therefore serving as customers' first interaction with the company. With the significance of first impressions being so important to users, it was important that my team and I designed a website that was intuitive and visually appealing to users. Not only would this create a better reputation for the company but with optimal design, my team and I could help drive increased sales for the airline.

Not only would the design and creation of this website be significant for the client, but also for our team. As interns, this was our chance to prove that we could apply the hard skills we have learned in school to create a consumer grade product in just ten weeks. Through the completion of this project, we would also test our ability to work as a team as well as correspond with and adapt to client feedback. Successful completion of our project would show CapTech that we can apply our knowledge and are ready for the professional field after school.

2. RELATED WORKS

At the start of our internship, before being given our mock consulting case, we had one week to work on expanding our development

skills. To develop my ability to create a website with React and Material UI, I worked on the creation of a Twitter clone site (Nicotsou, 2021). Creating this twitter clone reintroduced me to React fundamentals as well as the capabilities of designing with Material UI. These technologies would both go on to play important roles in implementing the website for our client later in the internship, so getting this practice helped us gain a faster start once our real project began.

Another important piece of my success in our client project was going through Figma's guide and tutorials *(Figma,* n.d.*).* Before this project I had some experience with Figma from class at UVA, but had not used it nearly to the extent that I would in order to plan and present designs to the client team during this project. I did not have much experience with fundamentals of UX design going into this project, so the ability to read through these resources provided by Figma gave me guidance on how to start thinking about my designs and the way that users would interact with them. The other useful side of the Figma tutorials was learning all of the platform's different capabilities. Not only was Figma used by our team to plan before development, but we also leveraged prototyping within Figma to show our clients the interactions users would have on the site(?) before doing any coding. This ability allowed us to optimize our design and prevented the need to rewrite code.

3. PROCESS DESIGN

In this section I discuss the three phases of our project. We started with requirements elicitation, then development planning, and then implementation of our designs. Each of these phases aided the next and allowed us to efficiently and effectively serve our mock client.

3.1 Requirement Elicitation

The first step in the creation of our client's new web-front end was to elicit necessary requirements. Our team knew that meeting directly with the CEO, CTO, and head of CX at the client company to figure out the specifics they were expecting from our project would help us better plan and prioritize before implementation began. Working hand in hand with the product manager and scrum master on my team, I conversed with the client team to learn the technical requirements with which we were to implement the web front end. Not only did this meeting provide us with key pre-planning information, but it also gave us insight into how the client wanted us to communicate in the future planning and implementation phases.

3.2 Development Planning

After eliciting all necessary requirements, our team moved into the planning phase of our project. To produce fully implemented pieces of functionality every two weeks for our client, we chose to use an Agile methodology for implementation. We knew that this framework would best meet our needs because pieces of functionality were not very dependent on each other in this project. This meant we could fully implement a user flow such as searching for a flight without any implementation of different user flows such as creating an account. Our next step in planning was to write out in the form of user stories all the tasks we would need to complete to successfully implement our project. The team and I then voted on a point ranking for each of the user stories to estimate the amount of time each story would take to complete. Using the platform Trello, we were able to keep track of all of our user stories and the points assigned to each. Within this platform we were also able to add details to each story such as success criteria which would help us know when each story was fully completed. Our final step in the planning process before we could start our first sprint was to decide what piece of functionality we

would implement in sprint 1. In collaboration with our client, we decided to begin with the homepage and flight search functionality and we designated such user stories as active tasks for us to complete in the 2-week window.

3.3 Challenges and Solutions

As we began implementation the team ran into some challenges along the way. One of the first issues the team had was getting conflicting feedback on our implementation methodology from people on the client team. As we began building out the specific piece of functionality designated to our first sprint, one of the stakeholders in charge of customer experience on the client side expressed that they would like to see more than just this functionality designed using Figma before implementation of any element of the website. This feedback did not meet the Agile methodology approach that we had discussed during the planning phase of the project, so we called a meeting where all the stakeholders on the client side could meet with us at one time in order to make sure everyone had the same expectations. Once we were able to meet and talk about the difference in feedback we had been receiving, we agreed that we would continue using the agile methodology we originally planned for, which allowed us to implement the piece of functionality planned for the first sprint. An important lesson from this experience is that ~~as~~ a consultant is sometimes going to get feedback from a stakeholder who is not on the same page as the rest of the stakeholder team, and it is therefore important to talk about all the information received by the team so that any confusion can be discussed and solved before moving forward. This challenge also gained us some credibility with the client team, as they saw our ability to handle a situation in which we hit a roadblock in development and appreciated the way that we went about clearing up the confusion instead of abandoning our plan.

Another challenge that we ran into early in the implementation phase was incorrectly predicting the amount of time it would take the team to complete implementation tasks. During our first couple of sprints, the development team was able to complete all user stories designated to the piece of functionality we chose for that sprint. This was not the most efficient form of implementation, because it created a need for correspondence with the client team to decide what other pieces of functionality could fit into the sprint window. By our last few sprints, the team was better able to estimate the amount of work that we could get done in one sprint, overcoming this challenge. This experience showed me that, similar to a sports team, a team of consultants needs some time working together in order to achieve optimal performance.

4. RESULTS

After ten weeks of project implementation, it was time to present our final product to the client team, as well as dozens of other employees at CapTech. We explained how our design decisions solved specific client challenges while we walked through the experience of creating an account, booking a flight, and checking in for that flight within our website. The feedback from the client team was very positive, as they felt we went above and beyond in terms of the features we implemented, as well as the sleek and effective design and user experience on the site. One specific feature the client found to be a great success was the responsive design I implemented. This allowed the website to have optimized design and performance for both laptops and phone users.

After our presentation, we invited our clients as well as members of the CapTech team to try out our website which we had hosted on an Amazon EC2 server. It was at this time that our website would be put up to the test, as releasing the site to many new users would

demonstrate whether we had successfully implemented an intuitive design, as well as identify any bugs not found through our user testing. We again received very positive feedback as users navigated the website, creating accounts and booking flights, on many different devices without any issues.

5. CONCLUSION

As this was just a mock client case, our website had to be taken down from hosting after this day and no further implementation would be done. This does not mean that there were no results from this project, though, as we had proven through this experience that we had the ability to work together and provide above and beyond support to a client. For most members of my team and I, this led to receiving offers to return full time to CapTech after graduation, a sign of great success for our project.

Along with the successful feedback my team and I received from our project, there were many learning moments from this experience that I will take with me for the rest of my career. Gaining the ability to efficiently use Figma will allow me to create designs before implementation to elicit feedback from designers and clients without coding in actual implementation. This ability has already been key to improving designs and saving time in other development projects. It is a skill that will benefit me and make me a more desirable software developer.

Not only did my technical skills improve, but going through this mock case with a 10-person team has allowed me to develop key skills in developing large applications as well as teamwork. With the other developers on my team, it was important that we had strong development operations skills in order to work on different parts of the codebase at the same time and eventually implement those developments into a final repository. Learning these skills through GitHub will serve me throughout my career as I work on larger projects.

The ability to work with the non-developers on my team also gave me practice in conversing intentions and requirements with people who are not used to the technologies I was using throughout the mock client case. The ability to work with a group of people with varying knowledge will allow me to be an efficient member of a wide range of teams.

6. FUTURE WORK

With the skills I developed from this mock client case, I will be returning to CapTech to work full time as a system integration consultant next year. The ability to communicate plans and elicit design requirements and feedback that I learned during this internship have prepared me for this role as I implement them with the client team I am staffed to. Along with these soft skills necessary for real world projects, the technical ability to create designs on Figma and implement those designs through code will be key in successfully completing tasks assigned to me as I enter my full-time role.

REFERENCES

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