

Front-End Software Internship: Restaurant Ordering Kiosk

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ABSTRACT

Self-service kiosks in the food industry often face challenges in providing streamlined menu access and efficient order placement. Many existing solutions are restaurant-specific and lack the capability for effective management and updates. Addressing this gap, our project, commissioned by a private client, aimed to develop a mobile ordering software application for integration into kiosks for a diverse range of restaurant groups. Undertaken by a team at a software consulting company, this development leveraged web technologies, including NodeJS, React, and TypeScript. The successful implementation of this software promises enhanced customer experience and has the potential to revolutionize how restaurants approach self-service ordering. Additionally, the project illuminated the importance of adaptive team collaboration in the face of unforeseen challenges. This project delves into the collaborative experiences, challenges, and learnings from the project, particularly highlighting insights from an intern's perspective.

1. INTRODUCTION

During my summer internship, I was added to a project team allocated to a company as a short-term contract. The food industry has been quickly evolving, with an increasing demand for digital and efficient customer experiences. The project was tasked to address this for the company, as this was their

current business model. While many teams within the company traditionally oversee their developed applications beyond the initial phase, our project's post-development management remained a looming question due to the client's determining factor being the final deployment. This situation greatly influenced our approach, especially regarding software architecture and ensuring reliable database management. We were very aware that our solution might have to sustain itself without our direct oversight beyond the contract deadline.

The root concept of the application was simple and innovative. Based on the client's designs, we were to develop a web-based platform allowing restaurants to easily upload their menus and proper inventory, which would then be available on simple kiosk machines placed on restaurant counters. The customers would then be able to select their menu choices and make payments at the kiosk. While the idea was clear, the path to its completion presented anticipated challenges, from ensuring user-friendly interfaces to maintaining database integrity and scalability. Along with that, issues such as providing metadata and working with the client's API data to provide an accurate example of website components were a challenge we faced during sprints.

Our team, a blend of interns, developers, managers, and testers spread across two

offices, had a diverse set of skills. This diversity ensured a well-rounded approach to the project, allowing us to anticipate potential snags and collaboratively brainstorm clever solutions.

2. RELATED WORKS

Research on self-service kiosks (SSKs) in the food industry is gaining momentum. Rahim, et al. (2023) studied customers' willingness to use these kiosks in quick-service restaurants, focusing on aspects like attitude and perceived enjoyment. Using an online survey from Penang, Malaysia, they found these factors significantly influence customer interactions with kiosks.

Similarly, Arsat, et al (2023) explored how affordability, accessibility, awareness, and acceptability impact customer preferences for SSKs in fast-food settings. Their findings suggest that these factors explain 56.5% of customers' preference for certain kiosks, emphasizing the need for both tech and marketing considerations in kiosk deployment.

3. PROJECT DESIGN

Our team's choice of "tech stack" was the following: React, TypeScript, JavaScript, and NodeJS. These decisions were guided by a commitment to staying at the forefront of technology. However, our selection was more strategic than simply keeping up with trends. Our decision was about finding the perfect balance between functionality and user experience. These technologies provided us with the needed flexibility, performance, and scalability required.

React, with its component-based architecture, was particularly well-suited for our needs. This allowed us to create reusable components, which enhanced both development speed and website consistency. TypeScript, paired with JavaScript, ensured

"type safety" and made our code more rugged and maintainable. On the backend, Node provided the efficiency and scalability needed for real-time data handling.

The development process was not just about coding. Just as important was the tooling and infrastructure that surrounded it. We incorporated test files, ensuring that each functionality and component was evaluated and met the desired standards of the client. Using custom components ensured that the site was not just another generic platform. The team made sure it was tailored to provide a unique and seamless experience to the end users.

Visualization and design consistency were crucial and the design tools, such as Figma, became priceless. Figma allowed the client team to craft, share, and iterate upon their UI/UX concepts, ensuring that we always remained aligned with the client's vision. Complementing Figma, Storybook became our go-to tool for component development, streamlining the process and ensuring uniformity across the board. Using Storybook allowed us to show the client team how components would be developed for the application, before integrating it on kiosk pages for the site.

One of the most unique and exciting aspects of our project was the physical kiosk. Ensuring compatibility between our digital output and this tangible interface presented unique challenges. Styling and functionality had to be spot on, as any discrepancies would directly impact the end user's experience. A particularly tricky challenge was adapting our work to the kiosk's web software, which ran on an older version of Chrome. This meant revisiting and often tweaking unsupported functions and styles to ensure they were compatible with the older browser. This was a painstaking task that highlighted the

importance of compatibility in web development.

Collaboration tools played a key role in our team's dynamics. Github was necessary. This enabled the team to maintain a readable codebase, handle merges, and ensure that version control was seamless. This collaborative effort was further enhanced by Jira, which managed our workflows. It allowed for clear task delegation across both project and client teams and ticket status tracking, and it ensured that every team member was aligned with the project's milestones and objectives for the given sprint.

The combination of new technologies, stringent testing, iterative design, and collaborative tools was the backbone of our project's success. It was not just about creating a solution; it was about crafting an experience for the future user. Every tool and technology was chosen with that aim in mind.

4. RESULTS

During my time as an intern, I became deeply immersed into the development of the kiosk application. Using the design tools, I carefully designed and implemented numerous essential components. Most of my components were used in the menu, shopping cart, and checkout flow. My job was to ensure that users would have a smooth experience when using the kiosk. In recognition of my efforts and to keep the client up to date with our progress, I volunteered to present a comprehensive demo, showing the application's capabilities on the menu screen and adding items to the cart. This was a proud moment that underscored the value of my contributions. Last, all of the code for components I developed was given meticulous tests and thereafter integrated into the main development branches. At that functional on the kiosk and were consistent with design standards. With that validation, I

was sure my work would serve as a lasting contribution to the project's future stages.

5. CONCLUSION

The completion of this client project internship demonstrates a significant milestone in the realm of food service and technology. Our team's dedication to developing a mobile ordering application for self-service kiosks has successfully addressed a critical gap in the market, offering a scalable and adaptable solution for various restaurant groups of different sizes and food types. The robust combination of NodeJS, React, and TypeScript has not only ensured the system's reliability but has also increased the efficiency and user-friendliness of the ordering process. This application helps restaurant owners with the ability to seamlessly manage and update their menus, which in turn provides customers with a dynamic and responsive dining experience.

The project's success at the time of my departure was a testament to our team's collaborative spirit, our commitment to innovation, and the essential role that cutting-edge technology plays in advancing our client's product. It reflected a forward-thinking approach to customer service, where convenience and technology converge to create seamless interactions.

As we project into the future, the groundwork established by this project is filled with opportunities for technological evolution within the food service sector. The project not only meets its initial goals but also acts as a catalyst for ongoing innovation, setting the stage for the next generation of self-service technology in dining.

6. FUTURE WORK

Though my internship wrapped up in August, the project was on track for a full launch in October. The team's immediate focus will be

on finalizing the application's checkout flow, with an emphasis on thorough testing and user experience optimization to ensure a seamless launch. Post-deployment, gathering, and incorporating user feedback will be essential to refine functionality and enhance the overall customer experience.

Looking ahead, there are plans to expand the application's features, such as adding advanced analytics for restaurant owners and predictive ordering to streamline inventory management. The potential for integrating voice recognition for hands-free ordering also presents an exciting avenue for innovation since that is an avenue of research at the company. As the project progresses without my direct involvement, I am confident that the foundation we built will lead to a successful and evolving product that pushes the boundaries of self-service technology in the food industry for the client.

7. ACKNOWLEDGMENTS

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