CS325 Team Green: Final Report

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1 ABSTRACT

Blue Wall has always been a well-liked dining location for students and faculty at UMass. Its popularity leads to long lines, crowded dining spaces, and a noisy, unrelaxing environment. Other restaurants have solved some of these problems by adding the option to order online, which cuts down the lines, reduces the number of people standing around waiting for their food, and makes it easier for customers to pick up their food and eat elsewhere if they want. However, for the system to be useful, users must have a quick and easy online ordering experience. We used what we learned from looking at existing online ordering applications, as well as what we learned from Professor Jasim's classes to build a clean and easy to use online ordering system for Blue Wall. Our ordering system sets out to solve 3 major problems: the problem of being able to see all the restaurants at once and the information about each, the problem of standing in long crowded lines, and the problem of not getting your order correct due to the hectic environment. Our ordering system fixes all of these problems in a simple, easy to use system.

2 INTRODUCTION

The inspiration for this project comes from the lack of an online ordering system for Blue Wall and also the many shortcomings of the existing Blue Wall website. Blue Wall can get very busy and restaurants have long lines and wait times, and it becomes impossible for people to get a quick meal in between their busy schedules. Additionally, it is very tricky to locate crucial information about restaurants in Blue Wall, such as menus, hours of operation, and nutrition facts. Thus, our application strives to enable users to build and place their order online and pick their meal up when it is ready, to avoid wasting time spent in lines and waiting for the food to be made, and to also serve as an informative hub for all Blue Wall related inquiries that customers may have.

In terms of existing solutions, there does not exist any sort of online ordering for food at UMass currently. So, we have researched existing restaurants that do have online ordering in place, such as McDonald's, Starbucks, Dairy Queen, and more, so we can see what works and what doesn't work with these current online ordering implementations to make our design as effective as possible. In terms of the information we would like to provide within our application, we heavily looked into the existing Blue Wall website and found many shortcomings that we would like to fix with our application. Notably, it was difficult to navigate to find the information that users were looking for, as the homepages and directories were full of promotions and articles, whereas many users would be going to this website for other purposes, such as to look at menus or find out if their favorite restaurant is open.

The existing solutions that we researched paved the way for our implementation to be created. It was important that our homepage was concise, informative, and easy to use, such that users would be able to figure out how to find the information they were looking for very quickly upon landing on our homepage. Additionally, we wanted to make sure that ordering through our application was as easy, if not easier, than placing an order in person, with an employee walking you through your order. Thus, we created our menus and customizable ordering, which would allow users to see all the menu items available and select the one they would like, and then customize it however they desire: adding or removing toppings, ordering a side, providing special instructions, and more. It is extremely important that our application allowed for all of the same capabilities that exist when ordering in person, and that the user interface is easy to learn and use. The final part of our application is checking out and paying. For this part, we made our design familiar to use for customers who have made purchases online before, and also simple and quick, so as to remain within the theme of saving our customers time.

For our evaluation, we performed a heuristic evaluation of our website, and had users grade our application for the 10 heuristics highlighted in Nielsen and Norman's heuristics for user interface design. This would give us information about all of the different aspects of our website and about what it did well and what could be improved.

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Our results showed that our application was very usable and user friendly, but could be improved in two main ways: aesthetics and visibility. Most users noted that our application worked as intended and was fairly intuitive, but did not look particularly visually appealing. We expected this to be the case, as our application was basic looking, and more of our focus was on ensuring that it got the job done and was usable. With more time, however, we certainly would have liked to learn more about HTML, CSS, and frameworks such as Bootstrap to be able to make our application look nicer. We also believe this would serve the added benefit of providing users with more familiarity to other websites. The second common criticism we received was about the lack of visibility in some places: multiples users commented that it was difficult to see which items they had selected, and also to deselect an item if they had accidentally made the wrong choice. This is valuable user feedback that will go a long way in helping us improve the usability and ease of access for our application.

3 RELATED WORK

Due to the fact that UMass doesn't have any type of online ordering system, we focused our external research on mobile ordering as a whole. Since the problem we wanted to tackle was creating an efficient, simple to use mobile ordering platform, we decided to dive into Incisiv's analysis of the top 52 limited service restaurants and a blog post regarding how mobile ordering needs to take into account the restaurant side as well. Online ordering surged during the pandemic and led to a ton of improvements; however, it still is not perfect and every company continues to work towards increasing customer satisfaction and retention. By breaking down the online ordering process into four main processes it becomes easier to see how companies can improve online ordering for both the customer and its employees.

Incisiv's analysis focused on four main parts of online ordering: research and discovery, online ordering, pick up and delivery, and customer engagement and service. Due to the time constraint and scope of the project we decided to focus on the research and discovery and online ordering aspects. We felt that this, along with the blog post, would give us an in depth and well rounded understanding of what makes an online ordering service successful.

Research and discovery is about having a menu setup that is informative as well as easy and simple to navigate. Things such as allergen information, a clean home-page, and store hours are all key features Incisiv identified through customer research. We found that we could really hone in on these last two features in our system. We found we could easily address the latter by incorporating pre-attentive open and close icons as well restaurant hours directly underneath. The sharp green and red colors draw the user's eyes to the bottom where they will also see the hours and understand if these hours fit with their schedule. In order to keep our homepage clean we decided to use a grid system with pictures similar to Uber Eats. We decided to include a link to Blue Wall allergen information and other resources that customers may find helpful in our About Me section. We believed these three features were absolutely necessary and made sure to prioritize them. If the customer can easily pick a restaurant and understand if they have enough time to make it to the restaurant, then that's solving some of the problems we identified in Milestone 1 such as students skipping meals or being late to class.

The second hurdle people encounter when trying to order online is the actual aspect of picking their meal. Online ordering systems have come leaps and bounds in terms of the ability to pick and choose. We decided that this would be a key aspect of our system and allowed for the customization of almost all orders. This flexibility simulates a real restaurant and allows customers to enjoy their meal exactly the way they want it. We attacked this through building our menus as customizable only for the most part. This meant users could easily work from top to bottom building their meal rather than selecting menu items and removing or adding ingredients.

These key features are ones that can sometimes get overlooked when focus shifts to smaller fancier features or a better aesthetic. That is why we made sure to key in on these two areas and have them act as our foundation for the system. We knew our problem and understood that these features would fix that, so sticking to these features allowed us to create a very solid system and then add on some of the fancy stuff afterwards. This included things such as wait time estimate, visually cleaner homepage, and a credit card number checker. Online ordering has become such a large part of society that it is for the most part very fault free and we found most confusion comes when the system becomes overly congested and too fancy. Therefore, keeping our system simple and user friendly were absolute necessities when it came to designing our Blue Wall online ordering system.

4 SYSTEM DESCRIPTION

For our system, we all decided on creating something that was not only simplistic to cater to all users but also one that was functional to the point that it didn't require any complicated learning on how to use our website.

As such, we decided to keep the homepage basic but also informative. We did this with 3 ways to redirect the user to the restaurant they wanted: via clicking the name on the homepage, clicking the image of the restaurant, or by using the tab on the navigation bar that allowed for the user to get to where they needed. In addition, two things we realized that were missing from the Blue Wall site and things that would help enhance the user experience was adding an Open/Closed sign. We paired this up with either showing when they would open next, if they were closed, and paired it with the estimated wait time, if they were open. All these things were small factors that we thought would make a significant difference in terms of the user experience when it came to using our system.

On to the main reason why we really pushed hard to create this, the customizable ordering feature. As was mentioned in a previous section was the lack of an online ordering system at Blue Wall coupled with the limitations of the current Blue Wall website. As such, we put forth lots of time and effort into ensuring that our customizable ordering page was as good as it could be in order to achieve our goals for this project. Using Tamales as an example, we decided that the best way to achieve this goal was to lay out every option in front of the user. As such, we created a page where we placed everything in front of the user for them to choose. Below is an image of the page where one can order a burrito in the Tamales

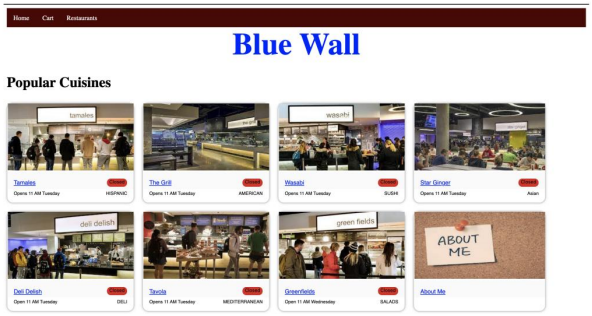

Figure 1: Homepage

restaurant. It's laid out by the same choices that you would get if you went and ordered in person, to make a familiar ordering experience.

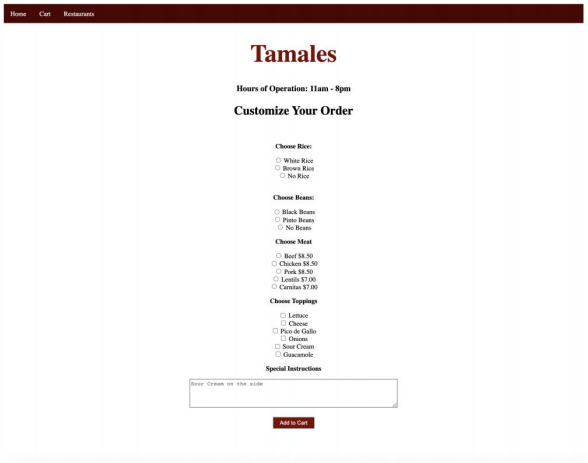

Figure 2: Tamales Customizable Ordering Page.

The last key feature we added was the payment page. In this page, we made it simple for the user to check out and place their order. Once you selected your order, you can click the "Add to Cart" button as seen in second figure. Once doing so, you are able to add the items to your cart with ease. Lastly, the payment page is shown below where the user can quickly enter their card details to pay for the food so that they can pick it up with no in-person interactions required.

5 EVALUATION

We used the heuristic evaluation method to assess our design. We gathered people to perform an evaluation by simply having each team member ask a friend. We also had them administer the evaluation to each participant in an individual setting; we did not meet as one big group to perform the evaluation.

We had the the evaluation participants fill out a sheet that can be seen in figure 4.

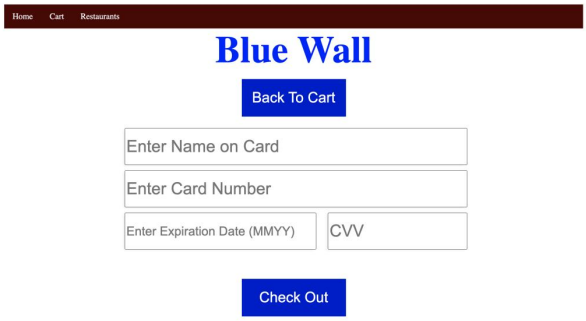

Figure 3: Cart Page.

Severity Scale		Extent Scale	
0 - Not a usability problem 1 - cosmetic problem 2 - minor usability problem 3 - major usability problem; important to fix 4 - usability catastrophe; imperative to fix\		1 = single case 2 = several places 3 = widespread	
Heuristic	Severity	Extent	Comments
H1: Visibility of system status			
H2: Match between system & the real world			
H3: User control & freedom			
H4: Consistency and standards			
H5: Error prevention			
H6: Recognition rather than recall			
H7: Flexibility and efficiency of use			
H8: Aesthetic and minimalist design			
H9: Help users recognize, diagnose & recover			
H10: Help and documentation			

Figure 4: Evaluation sheet

We used the 10 Nielsen heuristics:

H1: Visibility of system status

H2: Match between system the real world

H3: User control freedom

H4: Consistency and standards

H5: Error prevention

H6: Recognition rather than recall

H7: Flexibility and efficiency of use

H8: Aesthetic and minimalist design

H9: Help users recognize, diagnose recover

H10: Help and documentation

We also have both a severity and extent scale
Our severity scale will be from 0-4

0 - Not a usability problem
1 - cosmetic problem
2 - minor usability problem
3 - major usability problem; important to fix
4 - usability catastrophe; imperative to fix

Our extent scale will be 1,2,or 3
1 = single case
2 = several places
3 = widespread

Before starting the evaluation, we had our group members briefly explain what each of the heuristics mean to the participants, and made sure that they understood each of them, as well as the severity and extent scale. We then had them perform 1 problem from S1 and 1 problem from S2, to ensure the participants interacted with our website in different ways:

S1 : Start from homepage, order a bowl from Tamales, checkout with card info

S1: Start from homepage, order a from Wasabi, then go to grill via navbar and order a burger, remove the item from Wasabi, checkout

S2: Start from homepage, order from Greenfields, checkout with card info

S2: Start from homepage, order from Tavola, then go to Star Ginger via navbar, remove the item from Tavola, checkout

We wanted both sets to have multiple scenarios so users could experience the system multiple times. We also wanted multiple sets to ensure that as many of the Blue Wall restaurants as possible were evaluated.
Once we had our participant responses we used the severity and extent ratings to identify the heuristics that were most severely and commonly violated. With this, we were able to create a hierarchy of issues. This let us have a more specific focus when analyzing the comments and ratings we got, and it also ensured that we were addressing what users viewed as the biggest issues with our system.

6 RESULTS

Based on our evaluation method, we found that there were a few common usability problems that our participants ran into. The most egregious issue participants had was that users were having issues troubleshooting mistakes in their order. Our pages do not have functionality to alert the user if they forget to add a required item to an order, users would have to troubleshoot the issue themselves. This is something we would like have had implemented given more time.
Another common issue worth noting is users not being able to order multiple items from a single restaurant at once. To order multiple items, the users have to finish customizing one item at a time, and then go back to same restaurants page to customize a second item. This is another feature we would love to have worked on more.
Many of our test users also noted that the page is minimalist and plain. Because this is a first draft of the project, it is not entirely aesthetically pleasing, using basic fonts and having a blank background. Given more time to refine the design. It would be fitting of us to incorporate the classic UMass design to make it comparable to other UMass websites.

7 CONCLUSION

This project has served as an excellent learning experience in HCI. Working in an eight person team, we have learned how to work as a unit and be efficient while doing so. Managing an eight person team is not always easy but we did well in distributing work properly to ensure productivity. Having to meet deadlines while being in a team is something that we will face in the work field and we all contributed well and carried our weight. Some powerful tools we learned how to use effectively include GitHub, Figma and Latex. Further, we were given good experience working with the coding languages: HTML, JavaScript and CSS.

In conclusion, our project strives to create a system that enables online ordering for Blue Wall and we accomplished that. Referring to our results of the evaluation, we know what we can improve on, mainly being aesthetics. Going forward, we know to refer to gestalt principles and adhere to design guidelines. Also, given more time, we can fix the minor usability issues we noticed being ordering multiple items from the restaurant in one session and alerting the user if they are missing a required section.

8 PARTICIPATION

- Aditya Kumar: Coded the second iteration of the homepage and laid the groundwork for the Wasabi customizable ordering page. Helped to progress the ideas of the homepage and helped with some stuff on the backend for the customizable ordering. Wrote the System Description section for this report.
- Alex Hickey: Coded the customizable ordering for the application and extended it to many of the restaurants, customized with each restaurant's specific menu items and options. Additionally, helped with frontend, such as coding the base page for each website, and also various backend functions, such as navigation and adding food to users' carts. Finally, wrote the introduction section of the report.
- Davis Coleman:
- Eric Stevens: Worked to design and code the the customizale ordering pages front ends and back ends for the individual restaurants. Built the navigation bar across the whole system, was assisted by Alex in giving it functionality. Coded the buttons template to be used for buttons across the system to provide click feedback, performed a lot of bug testing and cleaned up small detail work throughout the system to keep it looking and running well. Wrote the Abstract for the report.
- Ethan Stafford: Responsible for all front and back end coding related to the cart page, including displaying items/restaurants correctly, price checking, and removing an item. Also assisted with coding in other sections of the website as needed. I was responsible for creating the specifics of our heuristic evaluation, as well as writing the section on it in the report.

- John Crowley: Coded the first iteration of the homepage and Greenfields. Helped further develop and progress ideas from original prototype. Original research into existing mobile ordering platforms and broke down online report outlining what customers expect from their online ordering system. Finally, wrote the related work section of the report.
- Stephen Cassata: Responsible for coding Deli Delish. Helped develop the first customizable ordering prototype and contributed initial ideas on how we would like the application to look. Wrote the conclusion section in this report.
- Zach Reynolds: Front and backend coding for payment details in order to create a mock payment validation system for the project. Wrote the results section of the final report.