



User Study Report

Team 11

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Executive Summary

Our team is developing an innovative web-based POS solution that harnesses the power of cloud computing to deliver unmatched scalability, security, and a seamless user experience. This venture capital-backed project aims to elevate our successful POS system into a dynamic Software as a Service (SaaS) model. By making the system web-accessible, we offer managers, cashiers, and customers unprecedented convenience and flexibility.

At the heart of our development process lies a deep commitment to user-centered design and inclusivity. We've carefully constructed detailed personas that represent individuals with a wide range of needs and abilities. A comprehensive user study, guided by these personas, unveiled crucial insights: the need for mobile optimization and translation support for users with limited English proficiency, compatibility with screen readers for visually impaired users, high-contrast themes and magnification tools for those with vision limitations, and large buttons, helpful tooltips, and a streamlined layout to accommodate users with limited motor skills or technology experience.

In direct response to these findings, we propose a series of impactful design moves. These include enhanced text settings for optimal readability, an optimized order placement flow to reduce clicks and simplify item removal, integration of a zoom plugin, distinct button backgrounds for easier visual identification, and adaptive text contrast for maximum clarity in any theme. By moving our POS system to a cloud-based, web-accessible model, we eliminate hardware constraints, bolster security and reliability through robust cloud infrastructure, and significantly expand accessibility. Our goal is clear: to develop a POS system that stands out from the competition in both its functionality and its commitment to inclusivity. With the support of this funding, we have the opportunity to revolutionize the POS experience, empowering businesses to better serve their diverse customers and employees.



Personas

Maria has difficulty reading English and often uses her phone as her main computer. As such Maria requires support for mobile devices and plugins to easily translate into other languages. In addition, the website must have simple language and easy-to-understand buttons that can be easily understood after automatic translation.

Jacob is completely blind and uses on-screen readers to be able to navigate websites. As such screen readers must be able to properly read the contents of the website. In addition to that he has plenty of experience using the Internet so making sure that the website functions similarly to many other ordering websites would allow for him to more fluidly use the website.

Vishnu is an engineer who has glaucoma and as such has trouble reading websites and requires the use of screen magnification and contrast adjustment. As such we should implement plugins to easily magnify the screen and change the contrast settings. In addition to that the contrast between buttons, backgrounds, and text should be high with several colors that stand out distinctly from each other.

Carol has difficulty with fine motor abilities as well as a lack of experience with technology and suffers from poor vision. As such we should implement large buttons that allow for options to be less likely to be clicked incorrectly. A help page to aid if she is unsure of how to use the website as well as a distinct and easily readable layout to make it simple to use the website and less confusing.

User Study Participants

Participant Name (May be Changed for Privacy)	Persona and Accessibility Needs	Responsible Team Member
Sheela	Carol - lack of fine motor skills, lack of experience with technology, poor vision	Shantanu
Larson	Vishnu-Very limited vision considered legally blind she uses screen magnification for most websites and to look at images	Nicholas
Brian [changed for privacy]	Maria - translation support, easy-to-understand instructions/wordings that can be easily translated into home language	Blake
Erica	Vishnu - Limited vision, uses high contrast modes to aid in viewing websites and	Sam



	images, lots of technical experience as an engineer	
Sean	Vishnu - Requires high contrast between buttons, backgrounds, and text so that they stand out distinctly from each other	Dongha

User Study Findings

See appendix 1

Proposed Design Moves

High-level Design Move	Detailed Description	Justification
Improve text settings	We could aim to improve the text settings, with things like increased weight, increase font size, and improved contrast	Certain users like Sheela had trouble reading certain parts of the application, and we could improve the readability of those areas by increasing the font weight and size.
Change order placement flow	We should change the actions required to place an order. Currently, the user must click on the item to make the add to order button visible, and then they must click the add to order button. We will display the add to order button by default. With this change, we could also make it easier to remove items from the cart in case items are accidentally added.	This is because Sheela clearly had trouble adding items to the order with ease, since she had to click twice in order to add an item to the order. With this in mind, it may increase the amount of misclicks, so we will also make it easier to remove items so the user does not have to go through a long process to do that either.
Implement zoom plugin	Implement a zoom plugin to allow users with low vision the ability to zoom in and read features more easily	Larson had a difficult time reading several pieces of text and instead moved closer to the monitor this could be fixed by implementing a zoom feature to make the features larger and more visible
Create backgrounds for	Implementing visually distinct	Larson had a difficult time



buttons	backgrounds to more easily distinguish important features and highlight buttons with similar features	distinguishing buttons from other features such as the title. As such implementing backgrounds for buttons with distinct colors would allow for easier navigation and usage of the website.
Make text change with background color for light/dark modes	Implement an automatic feature to ensure that all text is aligned with the color of the background to increase contrast and readability.	Erica had difficulty reading the menu items in the manager view for the view and edit menu selections as the text color was white while her background was also white within the application.



Appendix 1: User Study Observations and Interview Notes

Participant Name	Observations	Interview Notes
Sheela	<ul style="list-style-type: none">-Seemed to be uncertain as to how to navigate the application-Had some trouble populating order-Had trouble reading some item names-Manager page was easily navigated	<p>The text in the order placement page is difficult to read for certain audiences like Sheela. Also, the current button layout seems to cause some trouble for Sheela as well, as she struggles to click things in succession with accuracy. The manager page also has some text that is difficult to read because of the size/weight.</p>
Larson	<ul style="list-style-type: none">-Had a difficult time distinguishing what was a button and what was a label-Several times she put her face next to the screen to be able to see text and read-had difficulty reading buttons due to a lack of contrast between the text and the background-Had a difficult time reading text on the manager view page-had trouble distinguishing columns on the manager view page after she scrolled down	<p>In the customer view page, the main difficulty was with the lack of distinguishing buttons from their background making it hard for her to tell what was a label and what was a button. In addition, she had a difficult time seeing what was selected as it seemed that the maroon color did not have enough contrast compared to the black background. In addition several times she had to sit closer to the screen to read the text.</p> <p>On the manager page, her main problem was with reading the text in the buttons as the text is very narrow and small. In addition, the past order view was difficult to read as it was hard for her to distinguish the columns visually from each other as there was no visual separator.</p>
Brian [changed for privacy]	<ul style="list-style-type: none">- Needed to have certain buttons on the manager screen explained as there were no translation options within the application- Difficulty reading and overall differentiating the landing page's buttons from one another	<p>The manager page came with a few difficulties. Firstly, there were a few buttons on the left side menu that were not named in ways that made understanding their function intuitive. These buttons included the "Commonly Ordered Pairs" and "Product Usage Chart" buttons. Also, another thing that bothered the user was the</p>



	<ul style="list-style-type: none">-Certain manager page buttons confused as to what their function was (“Commonly Ordered Pairs“ and “Product Usage Chart”)-Liked the format of both the static menu and Customer view, wished there was more difference between selected and non-selected items however-Changing placement for important elements of web pages caused confusion (Item list on customer view and previous and next buttons on Manager view’s “View Previous Orders”)	<p>changing placement of the “Next” and “Previous” buttons within the “View Previous Orders” menu. It made it hard for them to quickly view the data (they also asked if there was any way to view orders from a specific date which I assured was coming in a later version).</p> <p>Both the Customer and Static Menu views of the application were very natural to the user. The only two complaints they had about these views were that there was little that separated selected items from unselected ones and that the views themselves looked too similar to one another (also found the constant changing of the finish order button to be a little jarring).</p> <p>Finally, the main ask for the user in future versions of the application was a translation feature. Since the user was mostly fluent in English and the current application did not have much of any complex English words, the user did not have much trouble navigating the web app. However, they said it would have been even easier for them to complete the tasks assigned to them if they could have everything translated into Spanish so that they did not have to spend time translating in their head a few words that they had trouble understanding.</p>
Erica	<ul style="list-style-type: none">- Appeared to have issues selecting the date in the manager view for adding a new item- Couldn’t read the text in view and edit menu as was in light mode- Added new item, did not appear in customer view as the item type that was inputted didn’t line up with the name filters	<p>The application is not easy to look at, the view could be made more appealing. With a lot of the text, it does not automatically change to fit the background based on light/dark mode. No options for modifying the orders, that would be good to make the customer more willing to buy more items. Add pictures for the orders and</p>



	<ul style="list-style-type: none">- building the order was navigated easily	<p>items. The item order buttons are not intuitive and should be made to look like actual buttons to be used. The user suggested adding columns to easily distinguish parts of the application as there is a lot of empty whitespace.</p> <p>The user liked how easy it was to add items to the menu. The rest of the application felt very incomplete to her and was not an enjoyable experience to use as a customer or manager.</p>
Sean	<ul style="list-style-type: none">- Wished there were images of menu items on the customer view page as he wanted to see what certain menu item looks like-Was not sure if item names were clickable at first-Thought there would be a confirmation page when he clicked the 'Finish Order' button. He wanted to double-check his order	<p>On the customer view page, the user thought it would be better if there were images of menu items as the user wanted to know what he would be getting. Also, the user thought the page could have more colors to distinguish the different buttons the customer could click. Finally, the user added that finishing and canceling the order was too easy as other users may have clicked those buttons by mistake. The user thought it would be great if there was a confirmation message before the action was done.</p> <p>On the manager page, the user thought it was easy to use and did not have a major problem with it. The user thought the text could be a little bit bigger for easier readability. The user also thinks 'View Past Order' should display the most recent orders first.</p>