

Interaction Design Project: Final Report

Group Member Names

1. Hemanth sai Bhuma – 1225435484
2. Surya Vamsi Kodeti – 1225272022
3. Venkata Sriram Medida – 1225364335
4. Chidvitha Yenumula – 1225577873

Website Name : Tshirtstore

Website URL : <https://www.tshirtstoreonline.com/en/>

Your Prototype Site URL : <https://58g5d6.axshare.com/>

Executive Summary

This study aimed to improve the functionality and user experience of an online store that specializes in selling t-shirts imported from Sweden. The main goal was to reduce the total time and clicks required for users to complete tasks on the website. The original website had several issues, such as the inability to change the quantity of t-shirts during selection, improperly validated input fields for customer details, and redundant fields, all of which contributed to longer task completion times. These issues were addressed in the redesigned website, resulting in quicker task completion times. The study involved 12 participants who completed tasks on both the original and redesigned websites, with a 100% completion rate for all tasks. The report provides a detailed explanation of the tasks, along with the changes made to the website, metrics, statistical evidence, and screenshots of both websites.

Method

Who we tested

Twelve people in all were taken into consideration to complete the jobs. 6 participants will work on the old website, while 6 participants will work on the new one. All the individuals we take into account are students, and of the 12 participants, 9 have technical backgrounds and 3 do not. Two participants are between the ages of 26 and 39, and the remaining 10 participants range in age from 18 to 25. Six participants are male and six are female.

Audience Type:

CS background	Non CS background	Total
4	8	12

Age	Number of participants
18-25	10
26-39	2

	Total: 12
--	-----------

Gender	Number of participants
Male	6
Female	6
	Total: 12

Computer Usage	Number of participants
0 to 10 hrs. per wk.	2
11 to 25 hrs. per wk.	7
26+ hrs per week.	3
	Total: 12

What participants did

A total of 12 participants completed a set of tasks, with 6 participants using the original website and the other 6 using the redesigned website. The metrics were recorded during the task completion process. The specific tasks performed are listed below.

Task 1 - Adding 2 different categories in men's t-shirt to the cart and filling out the details of the address.

Steps:

1. Go to the men's basic section on the website <https://www.tshirtstoreonline.com/en/>.
2. Select the desired size of the black t-shirt and add it to the cart.
3. Click on the shopping cart icon located in the top right corner of the homepage.
4. Review the items in the cart and Proceed to checkout.
5. Enter billing details, including name, email, telephone number, and postal code without any data type errors.
6. Review the details and Click on "Proceed to Payment."
7. Go to the men's section on the website.
8. Add one bike men's t-shirt to the cart.
9. Add another bike men's t-shirt to the cart.
10. Click on the shopping cart icon located in the top right corner of the homepage.
11. Review the items in the cart Proceed to checkout.
12. Enter billing details, including name, email, telephone number, and postal code without any data type errors.
13. If using the redesigned website, login to avoid having to enter an address again.
14. Review the details.

15. Click on "Proceed to Payment."

Task 2 – Adding 2 different categories of women's t-shirts to the cart and filling out the Billing Details similar to task 1 but now we are ordering different quantities of each T-shirt.

Steps:

1. Go to the <https://www.tshirtstoreonline.com/en/> website's homepage.
2. Go to the women's basic section on the website and select an orange t-shirt in the desired size.
3. Add the selected t-shirt to your cart.
4. Click on the shopping cart icon located in the top right corner of the homepage.
5. If you want to purchase multiple t-shirts, increase the quantity of the selected t-shirts. In the original website, you may need to go to the checkout page to make the changes before returning to the shopping cart.
6. Review the items in your cart to ensure they have been added correctly.
7. Click on the checkout option.
8. Enter your billing details, including your name, email, telephone number, and postal code, without encountering any data type errors.
9. Confirm your billing details.
10. To purchase a designer women's t-shirt, go to the women's section and add it to your cart, followed by another bike t-shirt. Once again, you can increase the quantity of the selected t-shirts.
11. Review your cart to ensure the items have been added correctly.
12. Proceed to checkout and enter your billing details without any errors.
13. In the redesigned website, you can opt to login to avoid entering your address again.
14. Confirm your billing details.
15. Click on "Proceed to Payment."

What metrics were collected

1. Time on Task:

A table has been provided below that displays the time taken to complete task 1 and task 2 on both the original and redesigned websites, allowing for a comparison of the time taken for each task on both websites.

Participants / Task times	Time on Task 1	Time on Task 2	Total Task Time
Participant 1	2 min 43 sec	3 min 33 sec	6 min 6 sec
Participant 2	3 min 29 sec	2 min 56 sec	6 min 25 sec

Participant 3	2 min 42 sec	3 min 9 sec	5 min 51 sec
Participant 4	2 min 43 sec	2 min 48 sec	5 min 31 sec
Participant 5	3 min 52 sec	3 min 30 sec	7 min 22 sec
Participant 6	3 min 30 sec	3 min 53 sec	7 min 23 sec
Average	3 min 10 sec	3 min 18 sec	6 min 28 sec

Table 1: Original website Task Times

Participants / Task times	Time on Task 1	Time on Task 2	Total Task Time
Participant 1	2 min 4 sec	1 min 56 sec	4 min 0 sec
Participant 2	2 min 2 sec	1 min 52 sec	3 min 54 sec
Participant 3	2 min 4 sec	1 min 45 sec	3 min 49 sec
Participant 4	1 min 59 sec	2 min 0 sec	3 in 59 sec
Participant 5	1 min 45 sec	2 min 0 sec	3 min 45 sec
Participant 6	1 min 50 sec	2 min 9 sec	3 min 59 sec
Average	1 min 57 sec	1 min 57 sec	3 min 54 sec

Table 2: Redesigned website Task Times

The two tables demonstrate that the redesigned website allows users to complete the tasks in significantly less time compared to the original website. Specifically, the average time difference between the two websites for completing the two tasks is 2 minutes and 34 seconds, indicating that the redesign has led to a considerable improvement in efficiency. This suggests that the changes made to the website have had a positive impact on user experience, making it easier and quicker for them to navigate and complete their desired tasks.

2. Efficiency:

The data efficiency provided below was determined by calculating the total number of clicks required to complete each task on both the original and redesigned websites.

Participants / Tasks	Task 1	Task 2	Total no.of clicks
Participant 1	52	53	105
Participant 2	61	61	122
Participant 3	59	60	119
Participant 4	63	62	125
Participant 5	57	57	114
Participant 6	55	56	111
Average	57.8	58.2	116

Table 1: Original website

Participants / Tasks	Task 1	Task 2	Total no.of clicks
Participant 1	35	34	69
Participant 2	36	36	72
Participant 3	31	31	62
Participant 4	35	35	70
Participant 5	38	36	74
Participant 6	32	32	64
Average	34.5	34	68.5

Table 2: Redesigned website

Based on the table presented, the average difference between the total number of clicks required for successful task completion in the redesigned website and the original website is approximately 48. This indicates that the redesigned website operates more efficiently than the original website, with a 40% reduction in the number of clicks required.

3. System Usability Scale (SUS):

At the end, the participants were asked to fill out a System Usability Scale(SUS) survey where the user had to give a rating on a scale of 1 - strongly disagree to 5 - strongly agree. The questions are mentioned below:

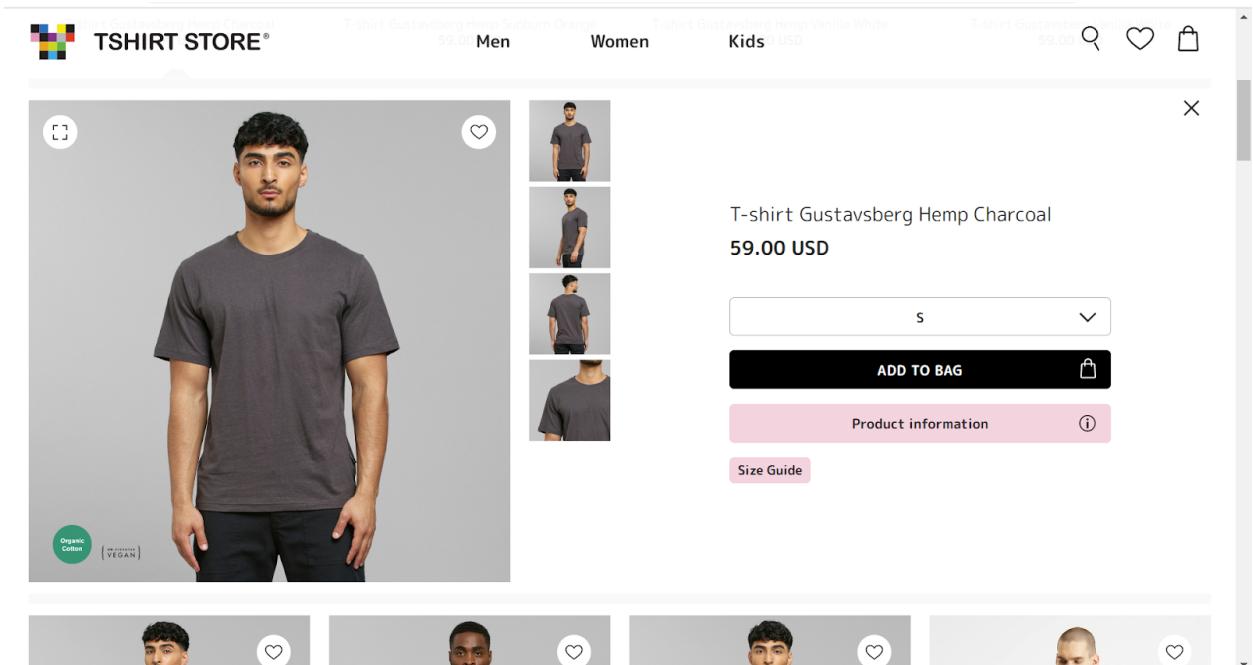
1. I think that I would like to use this website frequently.
2. I found the website unnecessarily complex.
3. I thought the website was easy to use.
4. I think that I would need the support of a technical person to be able to use the website.
5. I found the various functions in this website were well integrated.
6. I thought there was too much inconsistency in this website.
7. I would imagine that most people would learn to use this website very quickly.
8. I found the website very cumbersome to use.
9. I felt very confident using this website.
10. I needed to learn a lot of things before I could get going with the website.

The questions in the survey are intended to assess users' contentment or discontent with respect to the website's usability. This is achieved by using a positive or negative scale to gauge their satisfaction levels. By doing so, a comprehensive evaluation of the website's overall usability can be obtained, highlighting both its strengths and weaknesses. The results of such assessments can then be used to identify areas of improvement to enhance the website's user experience.

What improvements were made to the site

Implementation 1: Increasing quantity option is added in the selection page and displays the respective amount near the quantity field. (We need to go to the checkout page in the original website to increase the quantity).

Original Website:



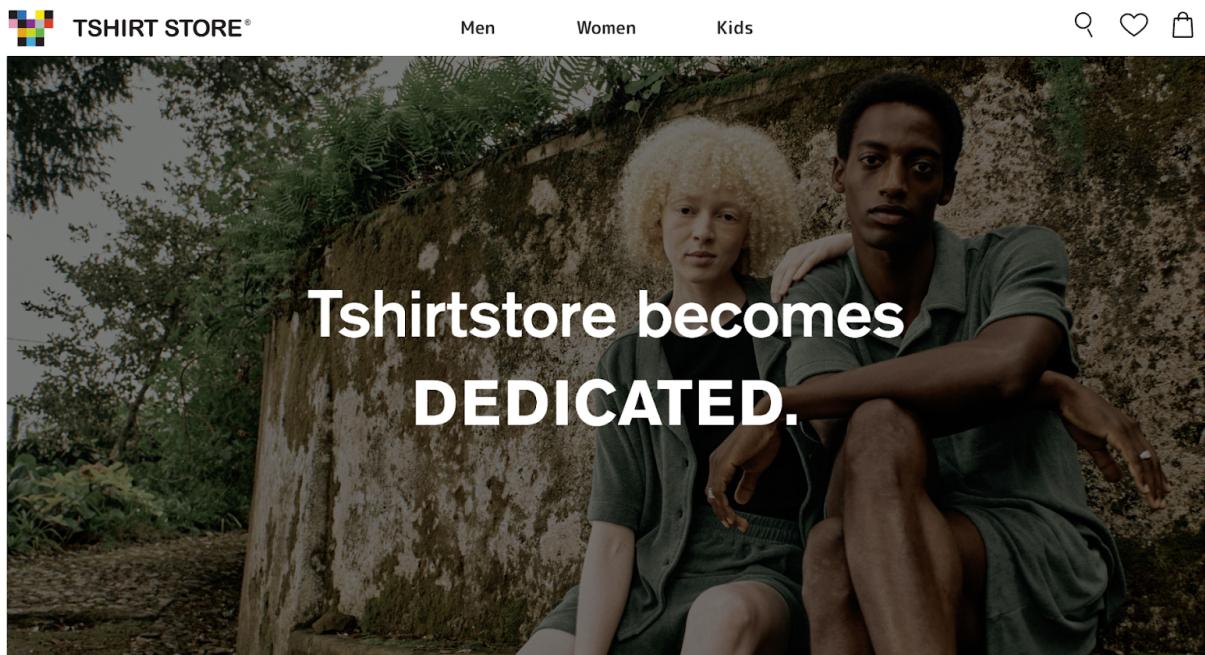
Redesigned Website:

The screenshot shows a checkout page for a "T-shirt Hemp Charcol - 35.00 USD". On the left is a large image of a male model in a dark t-shirt. To the right is a "Quantity" section with a minus button, a "2" input field, and a plus button. Below that is a "Size" section with a "XL" dropdown menu. At the bottom are "Total \$70", "Add To Bag", and "CHECKOUT" buttons. A newsletter sign-up bar at the bottom encourages users to "Get the latest T-Shirt drops in your Inbox! Sign up for our Newsletter." It features two images of models and a sign-up form.

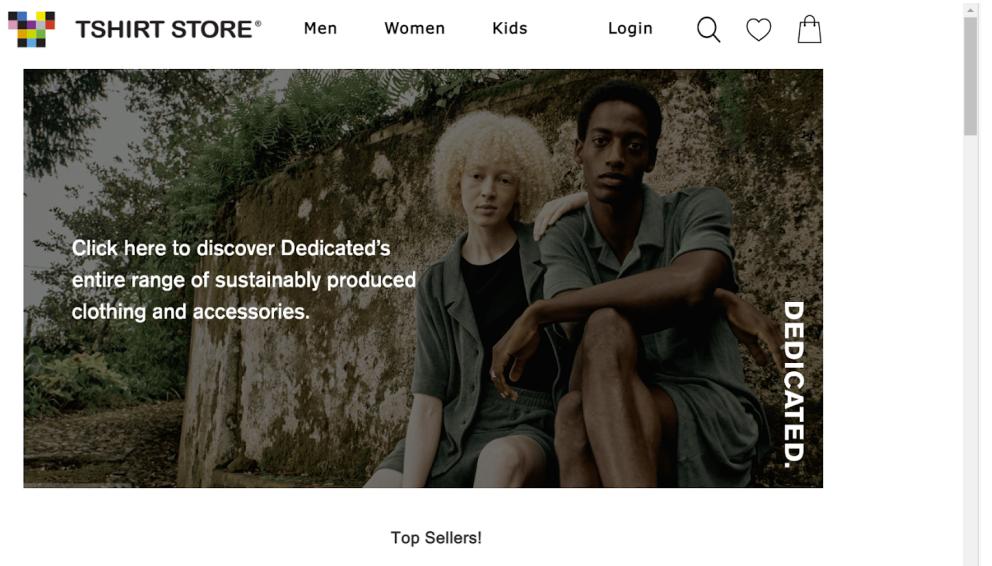
Using this feature, the user can modify the quantity of the t-shirts without visiting another page like in the original website. This can save time for the user while improving the user experience and usability of the website.

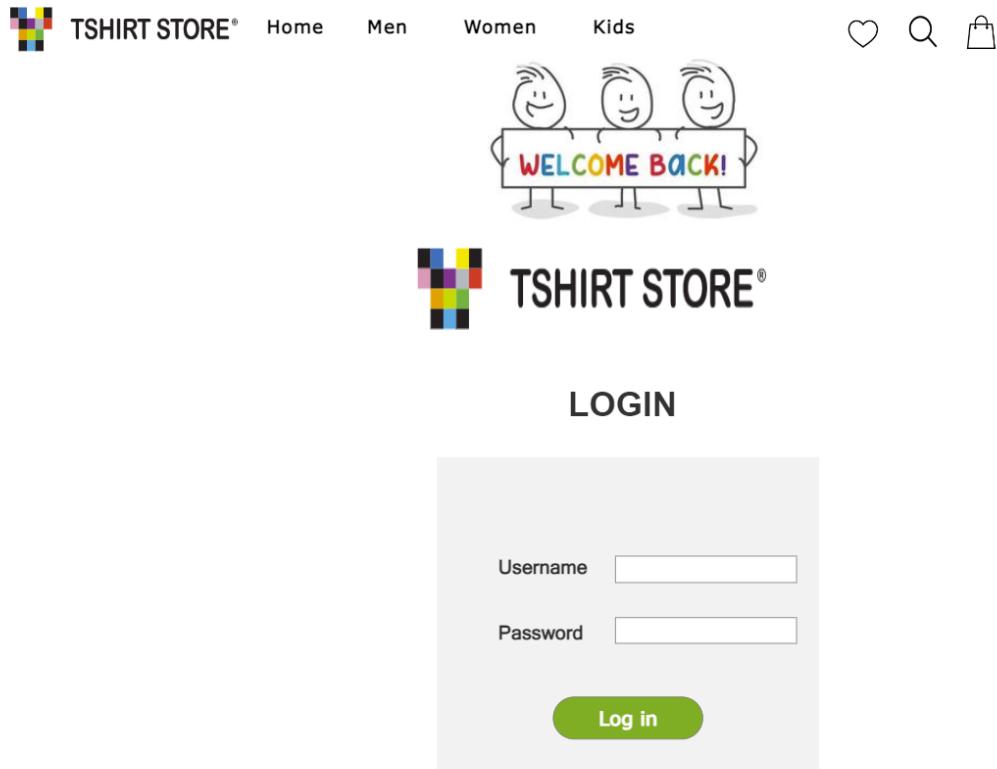
Implementation 2: Added a login page so address and other information can be saved.

Original Website:



Redesigned Website:

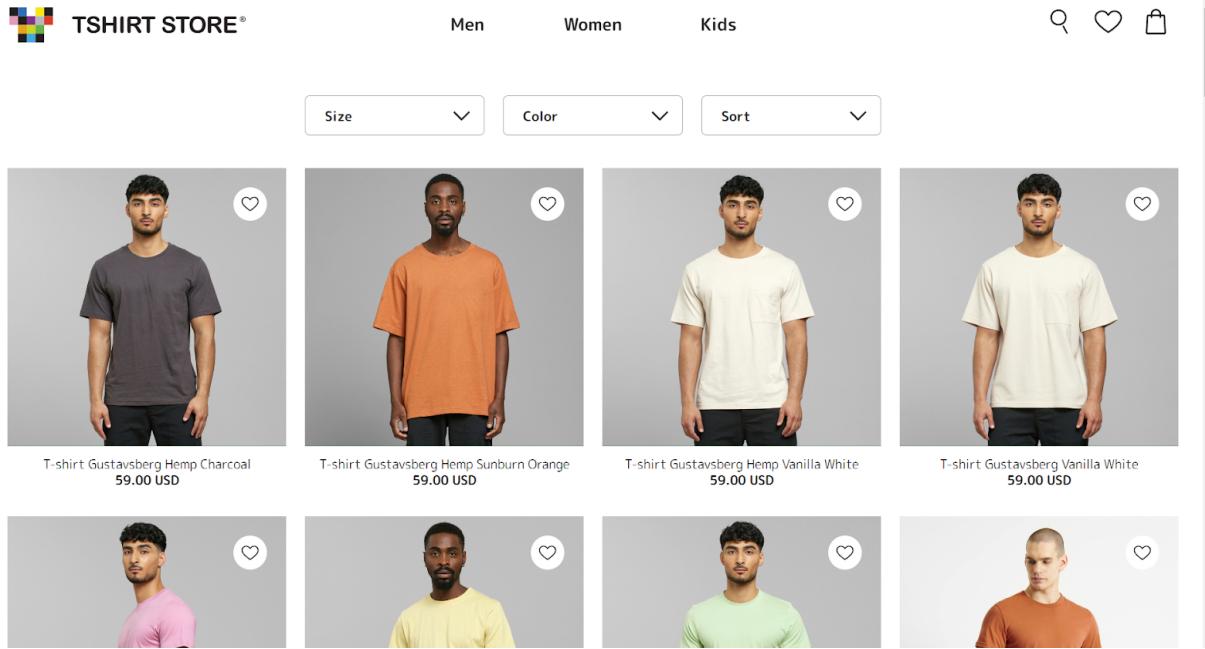




Previously in the original website, the user doesn't have any option to login to his/her account. So there is no scope for storing the user data such as address, previously used payment methods. Inorder to alleviate this problem we have implemented a login page in the redesigned website so that the user details can be stored and can be used when needed.

Implementation 3: Added a home page button in all other pages so the user can route to the home page from any other page.

Original Website:

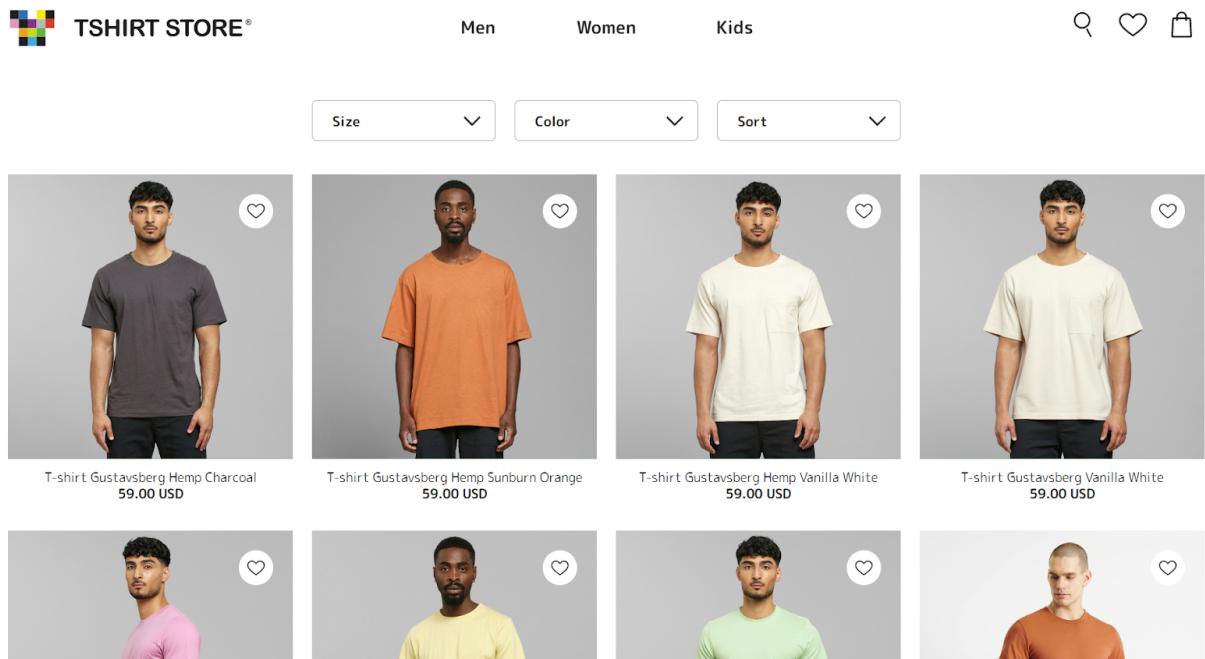


Redesigned Website:

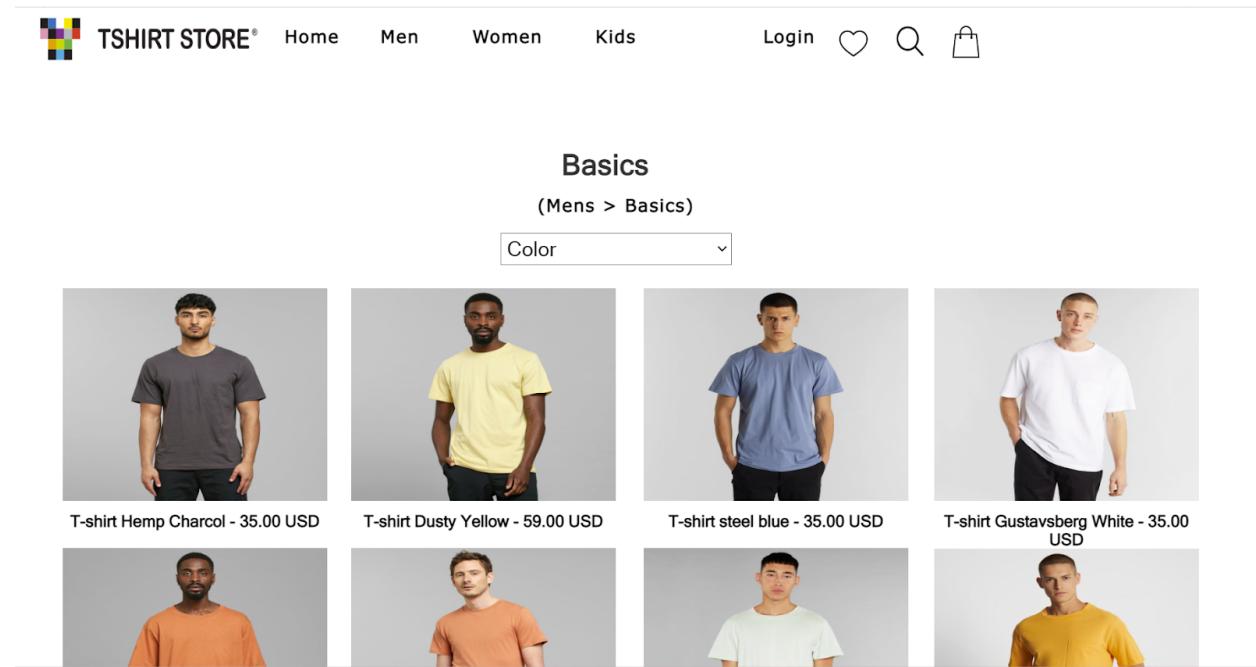
If we observe in the original website, we can see that there is no explicit button to return to the home page so there are high chances that users might feel confused about how to navigate to the home page. So to address this situation, we have added a “Home” button in the navigation bar so that the user can easily navigate to the home page without much effort.

Implementation 4: Added the current location of the user (in which page the user is in).

Original Website:



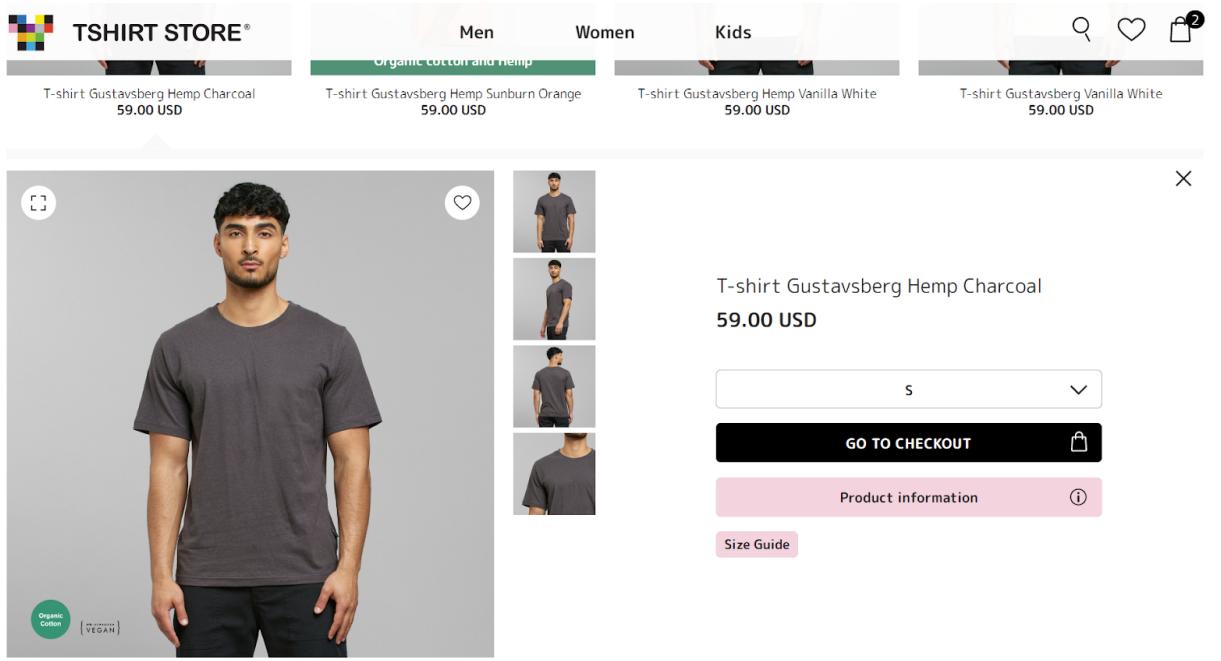
Redesigned Website:



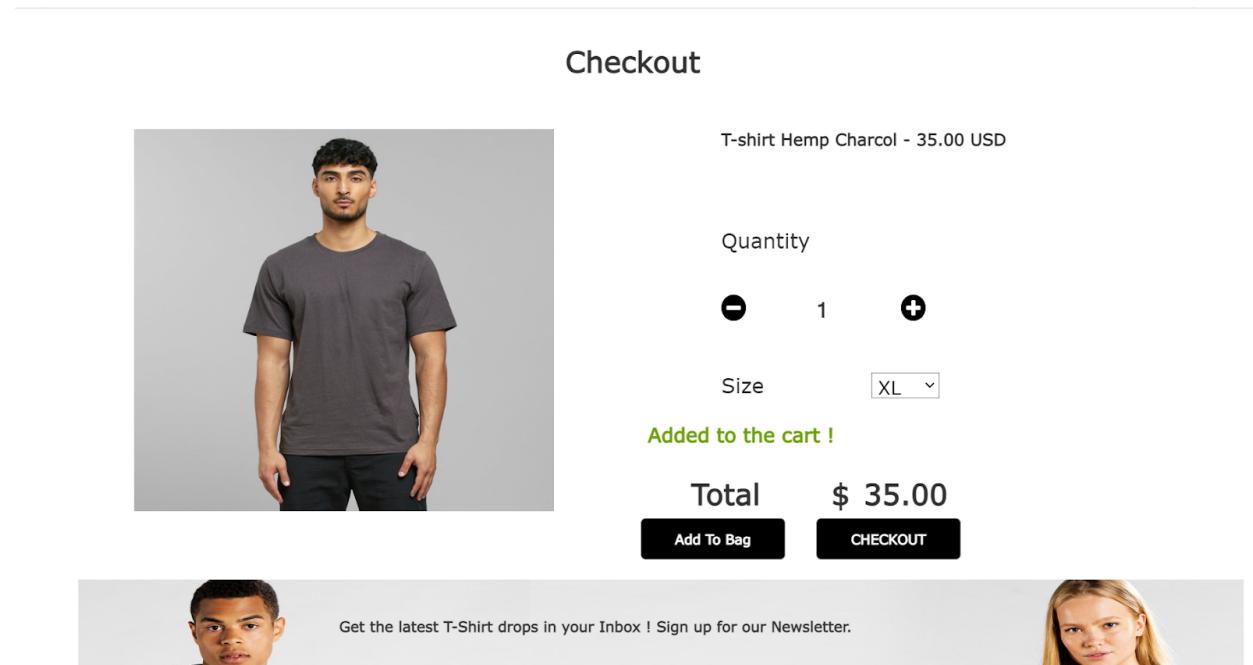
From the above images, it can be observed that the original version of the website doesn't explicitly state where the user is currently located. So there are chances that users might feel lost. This problem is addressed by adding the current location of the user (in the website) thereby improving the user experience.

Implementation 5: Provided the user with feedback when necessary.

Original Website:



Redesigned Website:



Note: Above pictures are captured after clicking the Add to bag/Add to cart button.

In the original website we can see that there is no feedback being given to the user after performing the action (clicking the add to cart button) it is violating an important principle in HCI

(Providing necessary feedback) so adhering to the principle, we have shown relevant feedback to the user when he/she performs the actions.

Implementation 6: Improved the readability of the website.

Original Website:

The screenshot shows a shopping cart interface. At the top, there are navigation links for Men, Women, and Kids. On the right side, there are icons for search, heart (favorites), and a shopping bag with a notification badge. The main content area is titled "1. Selected products". It displays a product card for a "T-shirt Gustavsberg Hemp Charcoal" in size S, quantity 2, and a total price of 2 x 59.00 USD. Below the cart, a pink banner says "32.00 USD left until free shipping! Continue Shopping". There is a "Voucher Code" input field and an "Add" button. At the bottom, a summary table shows Subtotal (2 items) at 118.00 USD, Shipping at 19.95 USD, and a Total of 137.95 USD.

Redesigned Website:

The screenshot shows a redesigned shopping cart interface. At the top, there is a logo, navigation links for Home, Men, Women, and Kids, and user account links for Login, Heart, Search, and Bag. The main content area displays two product cards. The first card shows a "T-shirt Hemp Charcol - 35.00 USD" with a size dropdown set to XL, a quantity of 1, and a total of 35.00. The second card shows a "T-shirt Stockholm Charcol - 35.00 USD" with a size dropdown set to XL, a quantity of 1, and a total of 35.00. At the bottom, it says "Total Amount Payable \$ 105".

From the above images, it is evident that the font size and the font color are not well chosen so readability of the website is lost. We have redesigned the website with the proper font size and color so that the website can be easily perceived by the user.

Implementation 7: Clearly marked the required fields with an asterisk symbol ("*").

Original Website:

The screenshot shows a top navigation bar for "TSHIRT STORE" with links for Men, Women, and Kids. Below the navigation is a section titled "Address Information" containing several input fields: First Name, Last Name, Email, Phone Number, Address Line 1, Address Line 2, Zip Code, City, and a dropdown menu for "Choose State". There is no explicit indicator for required fields.

Redesigned Website:

The screenshot shows a "Payment" page with a "Address Information" section. The section title includes a note: "* Indicates the required fields". Below are ten input fields, each preceded by an asterisk (*) indicating it is required: First Name, Last Name, Email, Phone Number, Address Lane 1, Address Lane 2, Zip Code, City, State (with a dropdown placeholder "Select a state"), and Country (with a dropdown placeholder "Select a country").

There is no proper indication for mandatory input fields (required fields) so the user might miss some of the required fields and thereby the user might need to iterate through the form several times every time he/she oversees a field. So in order to avoid this situation we have clearly

indicated the required fields with an appropriate symbol which can easily attract the attention of the user.

Implementation 8: Proper form validation has been performed.

Original Website:

The screenshot shows a web browser displaying a form for "Address Information". The form fields contain the following data:

- Surya Vämsi
- Kodeti
- skodeti@asu.edu
- 4255344
- This is a sample address
- Address Line 2
- 85282
- Tempe
- Arizona

Below the form, a payment gateway window is open, showing the following details:

Netaxept **nets**

Butik: Stockholm Tshirt Store AB
Belopp: 137.95 (USD)
Ordernummer: 900774

Välj betalningsmetod och tryck "Nästa".

Visa
 Mastercard
 Maestro

Avbryt Nästa >

Redesigned Website:

The screenshot shows a wireframe of a checkout form titled "checkout (2 of 7)". The form includes fields for Last Name (Kodeti), Email (skodeti@asu.edu), Phone Number (42352), Address Lane 1 (THIS IS A sample address), Address Lane 2 (empty), Zip Code (85282), City (Tempe), State (Arizona), and Country (United States). Below the form, there is a checkbox labeled "I agree to Terms & Conditions" with a checked mark. A red error message "Enter valid phone number" is displayed above the phone number field. A black button at the bottom is labeled "Proceed to payment".

In the original website, we can see that though there is an invalid input from the user, the form was accepted and the user was navigated to the payments page. It is very important to get valid and accurate information from the user, so we have placed strict constraints on the input fields and made sure to collect the accurate information from the user.

Overall Findings & Recommendations

For Task 1:

Metric 1 - Time Taken

	Mean	Standard Deviation
Original Website:	190 sec	30.87
Redesigned Website	117 sec	7.99

After analyzing the data, we found that the t-value is 5.6077 and the p-value is 0.000225. These results suggest that there is a significant difference in the time taken to complete task1 between the original and redesigned websites at a significance level of $p < 0.05$. In other words, we can reject the null hypothesis that there is no difference between the two websites. Additionally, the use of proper field validations and error messages for incorrect user inputs is found to be effective in reducing the time taken to complete tasks.

Metric 2 - Efficiency(Number of clicks)

	Mean	Standard Deviation
Original Website	57.8	4.05
Redesigned Website	34.5	2.59

The analysis found a statistically significant difference between the original and redesigned websites regarding the number of clicks needed to complete task1. Specifically, the calculations yielded a t-value of 11.8721 and a p-value less than 0.001, indicating that the difference is not due to chance. This result implies that the redesign successfully reduced the number of clicks required by the user to complete the task, which can lead to a more efficient and user-friendly website experience.

Original Sample Findings:

Both the metrics show that the original website takes a long time and more clicks.

The reasons for this are there is no feedback given after steps (like step completed successfully) and also there is no input validation and also as there is no feature like saving the address/ input from user, every time user needs to enter this data which made total mean time to complete task 1 high as 190 secs.

Redesigned Sample Findings:

In the redesigned website to avoid confusion, we added a feedback feature (which gives feedback like task completed) and also added input validation. As users can save the address/inputs, need not enter the address again which reduced total mean time for redesigned website to 117 secs.

The screenshot shows a web page titled "TSHIRT STORE*". At the top, there are navigation links for "Men", "Women", and "Kids", along with icons for search, heart, and bag. Below the header, there is a section titled "Address Information" containing the following fields:

- Name: Veena, Kuntalo
- Email: veenak@gmail.com
- Phone Number: 987654321Y
- Street Address: 1265 E UNIVERSITY DR
- Apartment: Apt G-2005
- Zip Code: 85288-8426
- City: TEMPE
- State: Arizona (selected in a dropdown menu)
- Country: United States (selected in a dropdown menu)

A green "Help" button is located at the bottom right of the form area.

Fig 1: Original Website (No input validation)

The screenshot shows a payment page for Netaxupt. At the top, it displays the order details: **Butik:** Stockholm Tshirt Store AB, **Belopp:** 78.95 (USD), and **Ordernummer:** 900806. Below this, a note says "Välj betalningsmetod och tryck "Nasta"." There are three radio buttons for payment methods: Visa (selected), Mastercard, and Maestro. At the bottom right are two buttons: "Avbryt" and "Nasta >".

Fig: Original website(Redirected to payment page even after incorrect phone number)

The screenshot shows a "checkout (2 of 7)" step. The "Address Information" section contains fields for First Name (Veena), Last Name (Kuntalo), Email (veenak@gmail.com), Phone Number (987656y550), Address Lane 1 (1255 E University Dr), Address Lane 2 (empty), Zip Code (85281), City (Tempe), State (Arizona), and Country (Algeria). Below the form, there is a checkbox for "I agree to Terms & Conditions" which is checked, and a red error message "Enter valid phone number" next to the phone number field. A large black button at the bottom says "Proceed to payment".

Fig : Redesigned Website (Error message is displayed)

Recommendations/Comments:

After implementing improvements to the original website, the redesigned website now performs tasks more efficiently, taking less time to complete. This was achieved through the addition of features such as input validation and feedback messages indicating successful task completion,

which helped to eliminate user confusion and also as the users can save the input values like address in the redesigned website. As a result, the mean time spent by users on this task was significantly reduced in the redesigned website when compared to the original website.

For Task 2:

Metric 1 - Time Taken

	Mean	Standard Deviation
Original Website	198 sec	24.73
Redesigned Website	117 sec	7.59

The calculations conducted revealed that the t-value is equal to 7.6699 and the p-value is equal to 0.000017. These results suggest that there is a statistically significant difference between the time taken to complete task 2 on the original and redesigned websites at a significance level of $p < 0.05$. This means that the redesigned website has resulted in a significant improvement in the time taken to complete task 2 compared to the original website.

Metric 2 - Efficiency(Number of clicks)

	Mean	Standard Deviation
Original Website	58.2	3.46
Redesigned Website	34.0	2.10

After analyzing the data, we found that the t-value is 14.6458 and the p-value is less than 0.00001. This indicates that there is a significant difference between the original and redesigned websites in terms of the number of clicks required by the user to complete task 2. The significance level is less than 0.05, which is considered significant.

Original Sample Findings:

Both the metrics show that the original website takes a long time and more clicks.

The reasons for this are that the task of increasing quantity is difficult, every time the user needs to go to the checkout page and change quantity and then come back to the shopping page. Also no feedback given after steps (like step completed successfully) and also there is no input validation which made total mean time to complete task 1 high as 198 secs.

Redesigned Sample Findings:

The reason for redesign website having such less average mean time (117 secs) is user can change the quantity of selected item in the same page itself immediately after selecting and also features like input validation and feedback reduced confusion significantly.

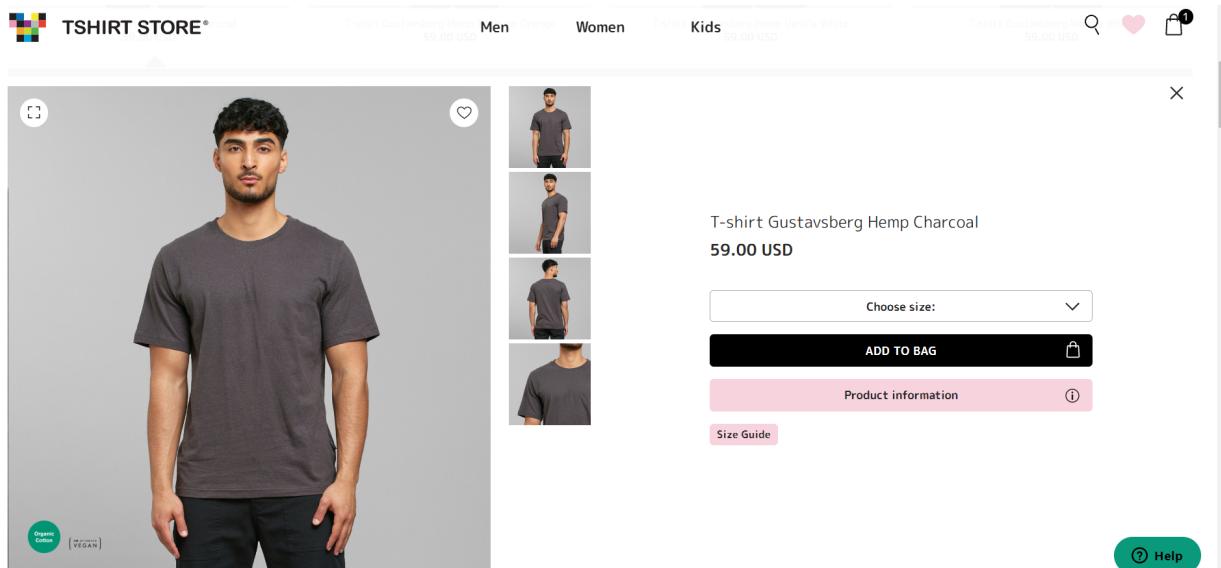


Fig: Original website(No option to change the quantity)

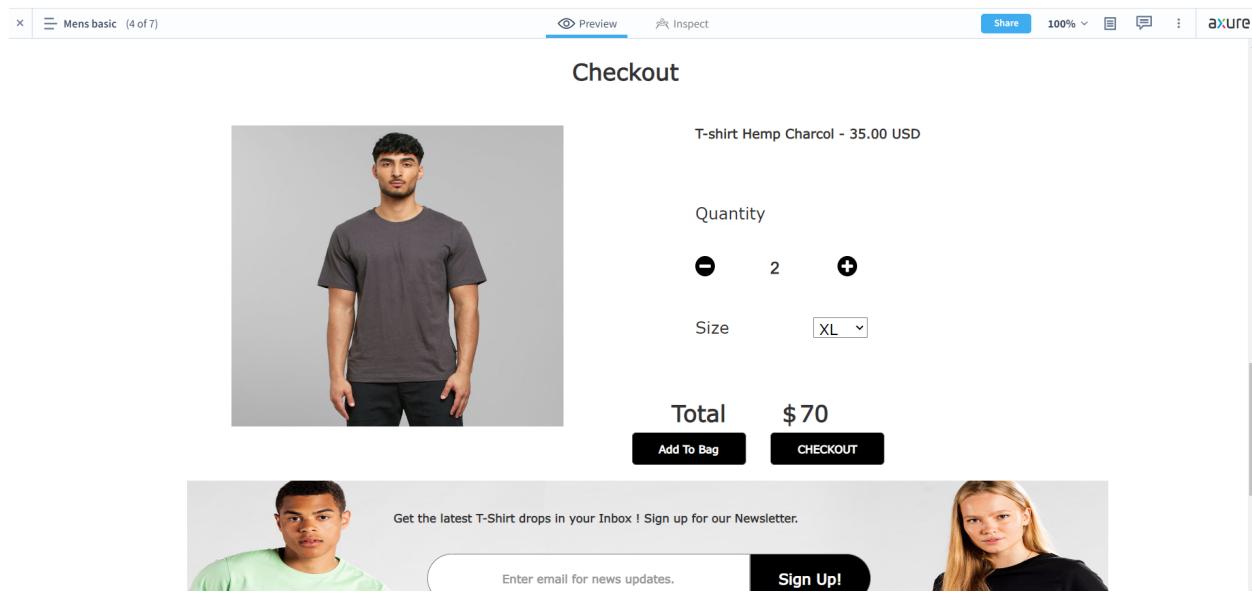


Fig: Redesigned website(Option to change the quantity is added)

Recommendations/Comments:

After implementing improvements to the original website, the redesigned website now performs tasks more efficiently, taking less time to complete. For this task this was achieved mainly through the addition of a feature - changing quantity in the same page where a product was selected and also features previously mentioned such as input validation and feedback messages indicating successful task completion, which helped to eliminate user confusion. As a result, the mean time spent by users on this task was significantly reduced in the redesigned website when compared to the original website.

System Usability Scale(SUS) Survey Report:

The following are the responses of the survey given by the participants after completing tasks on the original/re-designed website.

Users/Questions	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	SUS Score
User 1 (Original)	1	4	3	4	2	5	3	4	2	4	25.00
User 2 (Original)	2	5	1	5	2	4	2	4	1	4	15.00
User 3 (Original)	1	4	3	4	1	5	1	5	1	5	12.50
User 4 (Original)	3	4	2	4	1	5	1	5	1	5	12.50
User 5 (Original)	2	5	2	4	2	4	2	4	2	4	22.50
User 6 (Original)	3	4	2	4	2	4	1	5	1	4	22.50
User 7 (Redesign)	4	2	4	2	5	1	4	2	4	2	80.00
User 8 (Redesign)	5	2	4	2	5	2	5	1	4	2	85.00
User 9 (Redesign)	4	3	5	1	5	2	4	2	4	1	82.50
User 10 (Redesign)	5	2	4	2	5	1	4	2	5	2	85.00
User 11 (Redesign)	4	3	5	1	5	1	5	2	4	1	87.50
User 12 (Redesign)	4	2	4	1	4	1	4	2	5	1	85.00

- Mean of the Original Website : 18.33
- Mean of the Redesigned Website : 84.1
- Standard Deviation of the Original Website : 5.63
- Standard Deviation of the Redesigned Website : 2.58
- The t-value : 26.0317.
- The p-value : < .00001. The result is significant at p < .05

By combining the scores obtained from the System Usability Scale (SUS) with the time taken to complete tasks and the number of clicks required, it is evident that the redesigned website offered a significantly improved usability experience for users. The SUS scores measure users' perceived usability of the website, and the time taken and number of clicks required serve as objective metrics to validate the results. Therefore, the combined data provides a comprehensive evaluation of the website's usability, indicating that the redesign has resulted in a much better overall experience for users. This suggests that the enhancements introduced in the redesigned website have positively impacted the user experience, making it more efficient and user-friendly.