



CS 465 PRINCIPLES OF UI DESIGN – HOMEWORK 4



NOVEMBER 16, 2016
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Interfaces Under Study:

For empirical study, I have compared two popular e-commerce websites. With growing prevalence of e-commerce shopping, e-commerce platforms are improving and changing themselves drastically to cater the needs of the user.

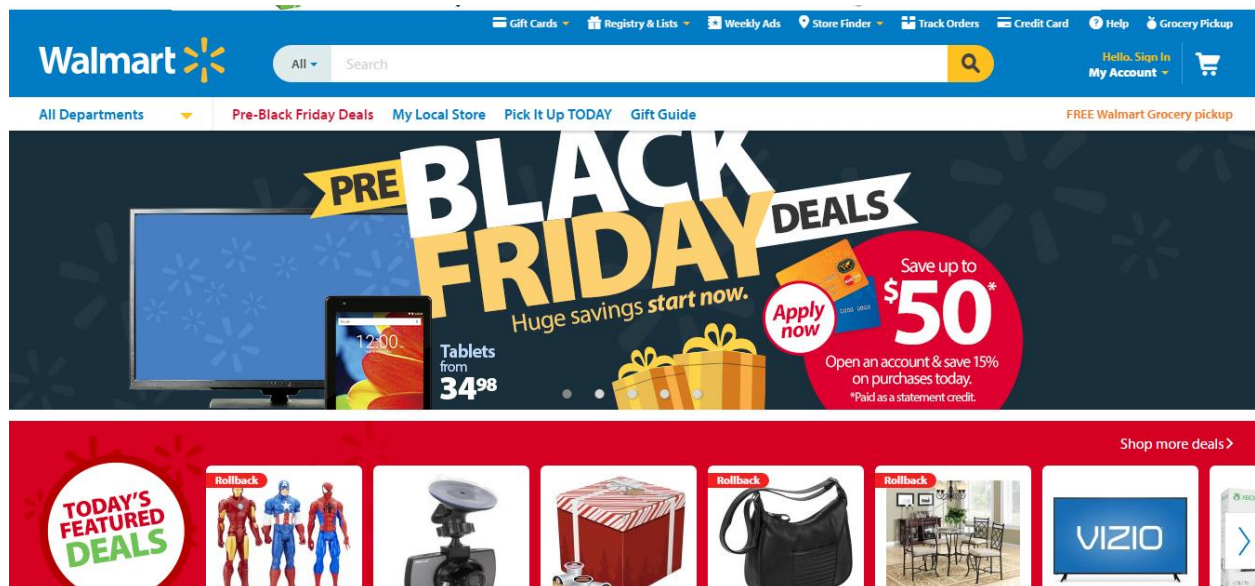
In this empirical study we shall compare two websites of famous retail stores in the US namely Walmart and Target.

Walmart:

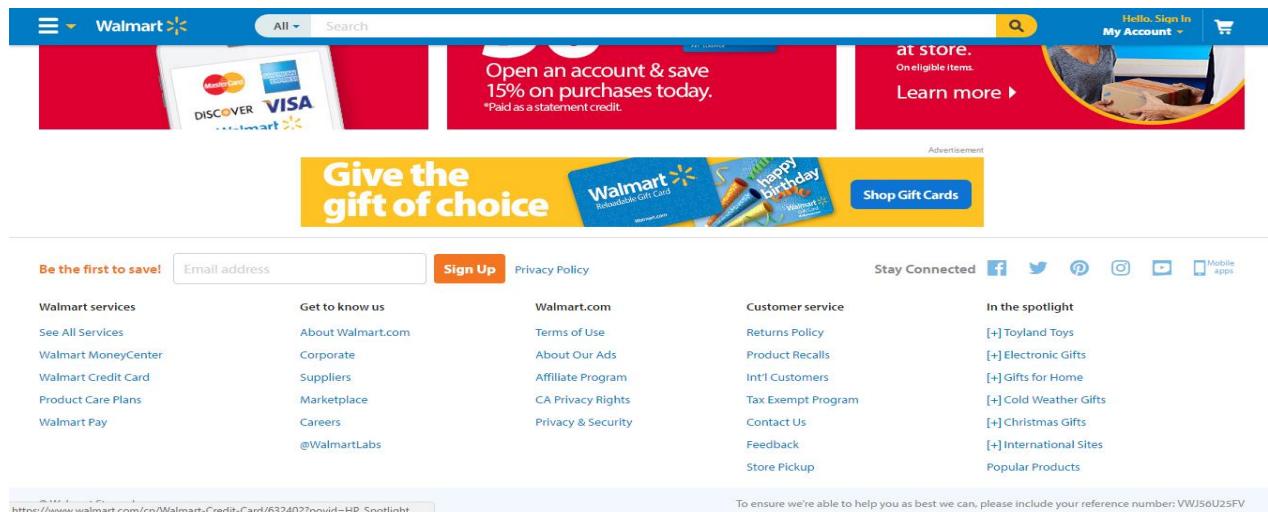
The interface is a website that provides online shopping to the products that are available in the store. Walmart predominantly sells home appliances, electronics, sports tools, automobiles, fashion accessories and a lot of products under various categories in this website. Users are provided with the flexibility of choosing different shipping methods and discount deals.

The interface has a global search bar to search for products and the search results with a filter criteria appear as result

Home Screen Top End:



Bottom end of home page:



Product Search Page with results:

Walmart

All

sticky notes

⌵

🔍

Gift Cards

Registry & Lists

Weekly Ads

Store Finder

Track Orders

Credit Card

Help

Hello, Sign In

My Account

🛒

All Departments

Pre-Black Friday Deals

My Local Store

Pick It Up TODAY

Gift Guide

FREE shipping on \$50+ orders

Our app is where it's at

Learn More

Showing 20 of 66,326 results

Departments

Shipping & Pickup

Color

Assorted

Staplers

Scissors

Rulers

Paper Punches, Paper Cutters, and Paper Folding Machines

Sticky Notes

Refine


Price

Top brands

Store availability

Sort

Best match



School Smart Self Adhesive **Sticky Notes**, 3" x 3", Yellow, 24-Pack

\$9.88

Rollback

★★★★★ (2)


Self sticky memo note pads

Measures 3" x 3"

Each pad contains 100 sheets

Free shipping on orders over \$50

Free store pickup



Post-it **Notes Super Sticky Super Sticky Notes**, 3 x 3, 5 90-Sheet Pads, Rio de Janeiro Collection

Walmart

All

sticky notes

⌵

🔍

Gift Cards

Registry & Lists

Weekly Ads

Store Finder

Track Orders

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Price

Top brands

Store availability

Sort

Best match



Post-it **Pop-up Notes Super Sticky Super Sticky Pop-up Dispenser**, 3" x 3", Assorted

\$14.13


★★★★★ (2)

Clear top designer dispenser with assorted Super Sticky pop-up Post-it notes. Includes dispenser and 12 notepads.

Model Number:

Free shipping on orders over \$50

Free store pickup



Post-it **Notes 2" x 2" Super Sticky Full Adhesive Notes**, Assorted Bright Colors, 8-Pack

\$4.24

★★★★★ (12)


Hold longer and stronger

Remove cleanly

Provide versatility and reliability

Free shipping on orders over \$50

Free store pickup



Sparco Spr-19788 Premium Pastel Adhesive **Sticky Notes Pad** - Repositionable - 3" X 3" - Assorted - 12 / ...

\$13.56

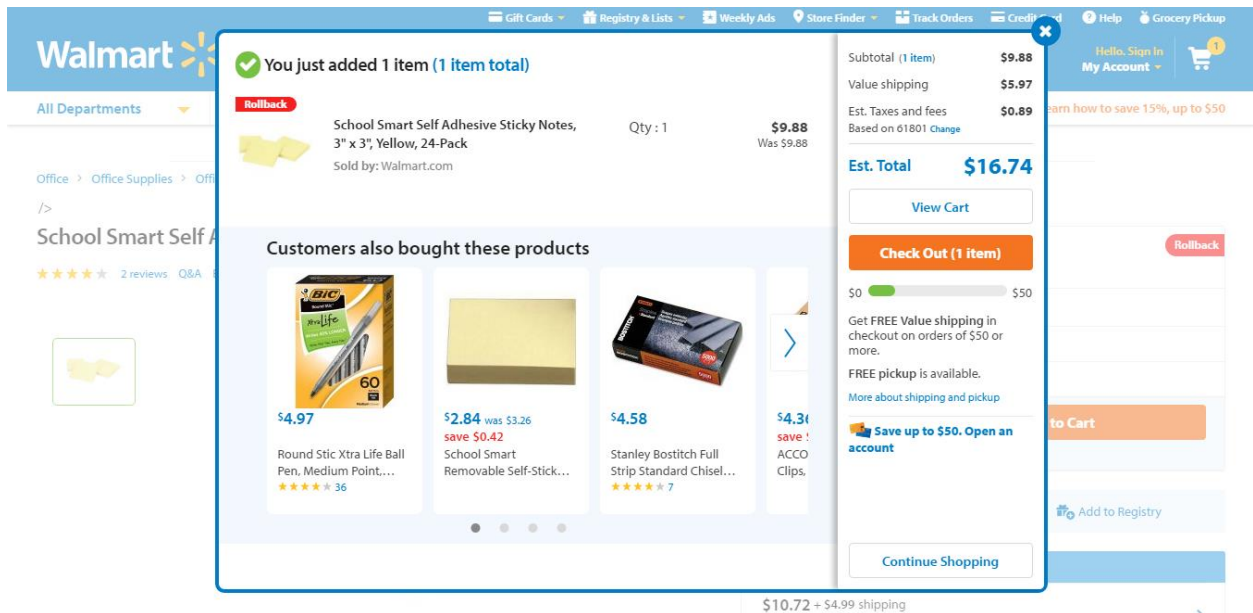
★★★★★ (1)

Sparco Spr-19788 Premium Pastel Adhesive Sticky Notes Pad - Repositionable - 3" X 3" - Assorted - 12 / Pack (spr19788)

Sold & Shipped by Beach Audio Inc

Free shipping

Product selection and add to cart:

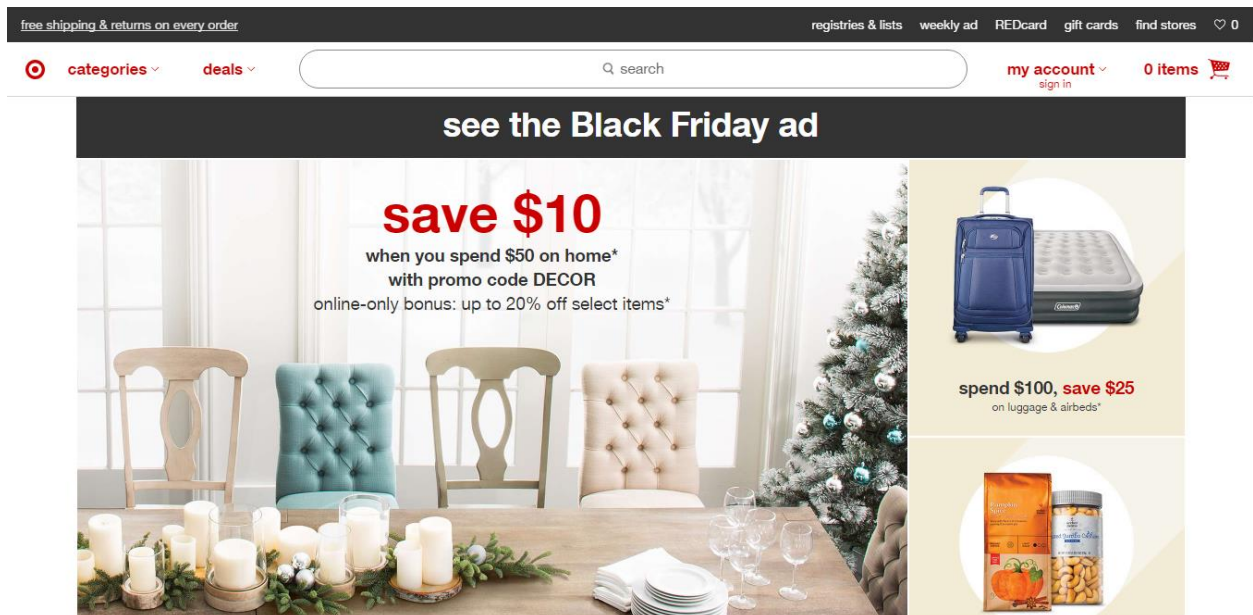


Target


The functionality of the website is very similar to that of Target i.e provides online shopping portal to the products that are available in the store. Target sells everything you can find on leading ecommerce stores especially for families' needs. Users are provided with the flexibility of choosing different shipping methods and discount deals

The product search page differs from that of Target in the layout of search result instead of using a list Target uses a grid and also the font size and spacing is different.


Home Screen Top End:




Bottom end of home page:




\$34.99
Shopkins™ Mystery Edition...




\$2.69 - \$4.99
Room Essentials™ Fast Dry...




\$23.99
LEGO® Super Heroes Marvel...



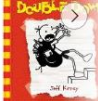
\$11.99
Tide PODS Spring Meadow Laundry...



\$59.99
Battlefield 1 (Xbox One)




\$195.99 - \$199.99
Beats Solo 2 Wireless Headphon...




\$11.16
Diary of a Wimpy Kid: D...


top rated items




\$218.99
LEGO® Star WARS™ Ewo...




\$9.59
Burt's Bees Aloe and Linden Fl...




\$19.99
Elf Pets®: A Reindeer Tra...




\$247.99
Beats Studio Around-the-Ear Wi...



\$17.99
Method Fresh Air High Efficiency...



\$16.99
Boys' 2-Piece Holiday Plaid Pa...



\$11.59
How to Charm a Beeke...


help ▾ stores ▾ apps ▾ social ▾ more ▾


recalls terms privacy interest-based ads ca privacy rights ca supply chain act [privacy updated 11/16](#) ™ & © 2016 target brands, inc.

Product Search Page with results and filter criteria:

free shipping & returns on every order

registries & lists weekly ad REDcard gift cards find stores ♥ 0

 categories ▾ deals ▾

my account ▾ [sign in](#) 0 items 

"sticky notes"

168 items

filter results

sort by **relevance** ▾

category




- school & office supplies (149)
- home (7)
- movies, music & books (4)
- back to college (3)

type

- ☐ Books (18)
- ☐ File Tab (1)
- ☐ Sticky Note Dispenser (7)
- ☐ Sticky Notes (141)

related searches

[up and up sticky notes](#) [pop up sticky notes](#) [lined sticky notes](#)



^ binding type

☐ Unbound (3)
☐ top (1)

^ material

^ color


^ price

^ availability

^ brand

^ guest reviews

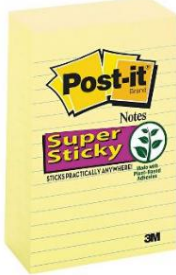
\$5.99
Post-it® Notes Super Sticky Super Sti...
get it by 11/18 with express shipping



add to cart

\$40.99
Sticky Notes 3" X 3" Post-It Mul...
subscription eligible
get it by 11/18 with express shipping


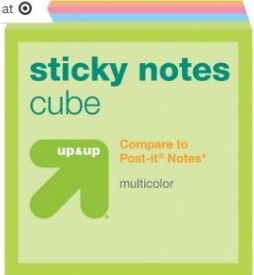
\$5.99
Sticky Notes Hamburger Notepad



add to cart

\$9.99
Post-it® Notes Super Sticky 4 x 6 Sup...
get it by 11/18 with express shipping

\$9.99
Post-it® Notes Super Sticky 3 x 3 Sup...
subscription eligible
get it by 11/18 with express shipping

only at



add to cart

\$2.32
Sticky Note Cube - Assorted Colors - 1 7/8...
★★★★☆ 2

Product selection and add to cart:

filter results

sort by relevance

^ category

school & office supplies (149)
home (7)
movies, music & books (4)
back to college (3)

^ type

☐ Books (18)
☐ File Tab (1)
☐ Sticky Note Dispenser (7)
☐ Sticky Notes (141)

^ binding type

☐ Unbound (3)
☐ top (1)

^ material


related searches

up and


added to cart

view cart & check out


guests also viewed




\$4.99
Post - it Notes Ultra Color No...




\$3.97
Post-it® Notes Cube, 3" X...



\$4.89
Post - it Notes Super Sticky N...



\$4.89
Post-it® Pop-up Notes, 3"...



\$5.89
Post-it® Super Sticky N...

continue shopping

User Tasks:

The typical tasks in an e-commerce website revolves around buying a product. The study focusses on various tasks that are a typical user will perform on a regular basis these include create an searching for a product and adding to cart, payment for the purchase and creating registries. We have not taken create an account or sign in as a task since it is very trivial.

Task 1: Searching for a product

The user would like to buy a product with specific characteristics. So, the user searches for the product and then selects the item to buy. He then adds the item to the shopping cart.

Alice is a broke college student. For the upcoming semester, she would like to buy notebooks for college that are cheap but still fashionable to carry. She is not willing to pay more than a dollar for a notebook and she needs to buy 5 of them. She visits the website (logs in), searches for the notebooks. From the

results of the search she finds the cheapest product available and adds the notebooks to her cart. She then exits the website

Relevance: The ability to find the product that the user looks for in the shortest time and with ease determines the popularity of the website. Also, the heart of an e-commerce website involves finding a product that suits the users need. This task forms predecessor for other tasks like making payment, removing a product from the cart, cancelling order etc.

Task 2: Place an order

Once the user is done with selecting the products to buy. He then places the order and chooses the payment (credit card, debit card) and the delivery options.

Alice visits the website (logs in). She goes to her cart and reviews the items that she had added to the cart. She then places the order by choosing the delivery date as 20th of November 2016. She then adds the address to which the product to be shipped to which is Alice Madison, Department of Computer, UIUC, Champaign, Zip code: 61820. Also, she chooses credit card as her mode of payment and enter the details of the credit card ie Card number:1234567890, expiry date: November 2018 and CVV:123. After entering the details she confirms her order and places it. Alice then exits the website

Relevance: The main purpose of the e-commerce application is to sell products. Since this task involves a lot of interaction with the user in terms of getting user inputs, selecting the delivery dates, it provides a lot of information for obtaining bottom line usability metrics. This ease of usability of this task determines whether the user will buy product from the website again since if it is not easy to use then the user will not prefer shopping using this website.

Task 3: Create a registry

It is common for users to create a registry to enable their friends and family know what to gift for them during special occasions like wedding or baby shower.

Alice Madison is to be married to her Fiancé Robert Langdon on December 26, 2017. She would like to create a wedding registry to share with her family and friends. She visits the website, creates a registry for her wedding and adds the following items to the list: a 23-inch Sony LCD TV, Philips Vacuum Cleaner. She then saves the list.

Relevance: This task is little different from the others discussed above. It generates a lot of revenue to the website since it involves a lot of item to be bought at a single go, thus it is an important task from the business side of view. If the users experience is not good in this task, then the website will miss out on large monetary transaction which might lead to loss of revenue.

Experimental Design:

Using Within Subjects design 4 users were recruited and the two users are given Target website first to test and then Walmart while the other two users are given Walmart to test first. To negate the learning effects the user of tasks are as follows:

User 1: Target Walmart Task1 Task2 Task3

User 2: Target Walmart Task3 Task1 Task2

User 3: Walmart Target Task1 Task2 Task3

User 4: Walmart Target Task 3 Task1 Task2

Questionnaire Forms:

The following was the questionnaire form used to collect user experience information and gain insights regarding user satisfaction. The user is provided with a questionnaire for each website

Structured questions: (One set for each website)

1. The website was easy to learn to use
1 2 3 4 5 6 7
Strongly disagree Neutral Strongly Agree
2. The website was very fast and responsive
1 2 3 4 5 6 7
Strongly disagree Neutral Strongly Agree
3. The website provided useful feedback during errors
1 2 3 4 5 6 7
Strongly disagree Neutral Strongly Agree
4. The website enables the tasks to be performed in a straightforward manner
1 2 3 4 5 6 7
Strongly disagree Neutral Strongly Agree
5. I would recommend the website to a friend
1 2 3 4 5 6 7
Strongly disagree Neutral Strongly Agree
6. The website was aesthetically pleasing
1 2 3 4 5 6 7
Strongly disagree Neutral Strongly Agree
7. I would love to use this website regularly
1 2 3 4 5 6 7
Strongly disagree Neutral Strongly Agree

Open Questions:

8.
 - a. Were there any parts of the website that was *easy* to use or understand?
 - b. Were there any parts of the website that was *difficult* to use or understand?
9.
 - a. Which of the given tasks were easy to perform in the website?
 - b. Which of the given tasks were difficult to perform?
12. If you could change one thing about website what would it be and why?

Summative Questions:

12. Among Target and Walmart which website did you like and why?

Metrics:

The metrics chosen for this experiment are completion time of each task, whether the user was able complete the task successfully (completion rate) and the errors that the users face while performing the

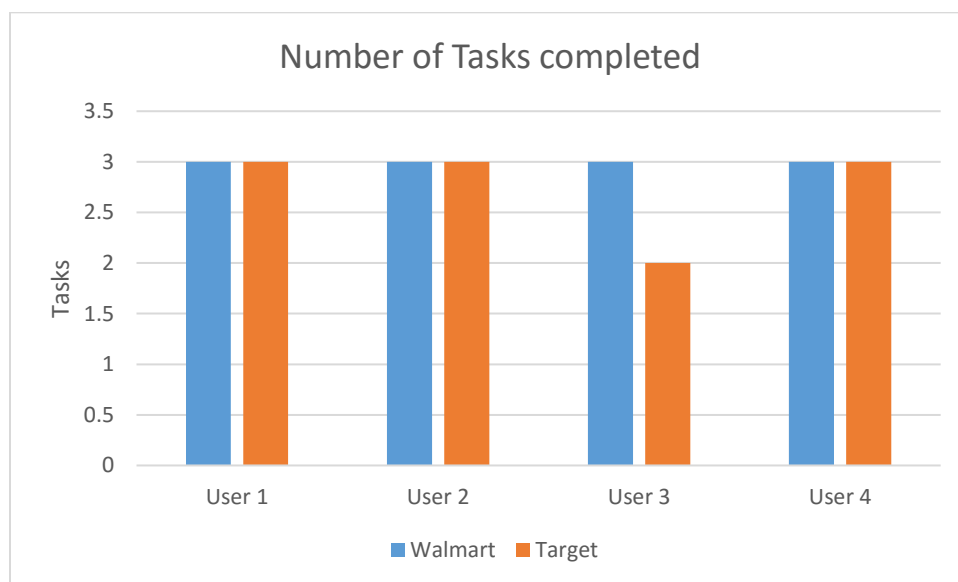
tasks. The difficulty of the task can be expressed in terms of how long the user takes to complete the task and the usability problems that the user faced. If the user completes a task in a short amount of time it implies that the interface and the task to be performed is clear. It also implies that the website is easy to learn

Also, the errors are calculated as a function of the number of questions raised, frustration expressed and the number of error messages that the user experiences while using the applications. All the factors are given equal weightage. Even though the websites display error messages every time the user enters any information that cannot be processed, it alone can't serve as a metric. Since the users were encouraged to ask question if they found anything irregular or if anything was unclear it was a useful metric to be considered as error. Also since most users will be hesitant to ask questions, any comments or frustration raised by the user indicates that user is facing difficulty i.e the website is not clear.

Task completion rate helps identify which task was difficult to perform. For user satisfaction, the questionnaire is used. For conducting the study, I was nearby and timed the tasks with a stopwatch and observed the interaction for errors.

Observation:

- **Task Completion Rate:** Out of the three tasks given to each user how many tasks were they able to complete successfully. Successfully is measured in terms of completion of the task as per the task description.



Most of the users were able to complete all the tasks except user 3 who was not able to complete one task for Target website

Average Task Completion Rate:

- Walmart: 100%
 - Target: 91%
- **Easiest task Vs Difficult task:** Based on the questionnaire we can identify the tasks that were easy for the user to perform and those that were difficult. The idea being that the we might have to consider the design of the difficult tasks in terms of what the users found difficult, whether the information provided was unclear etc.

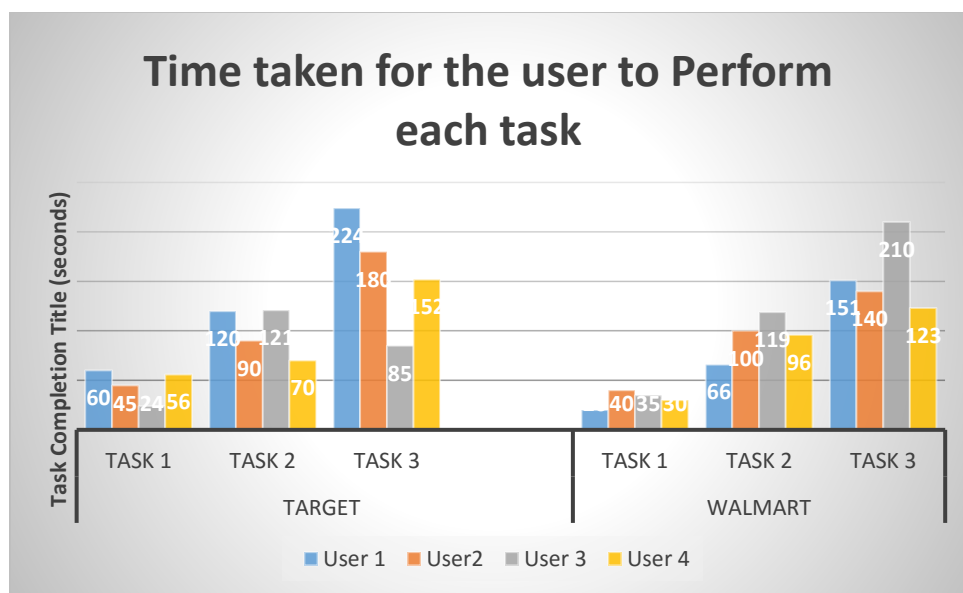
| | | User1 | User 2 | User 3 | User 4 |
|---------|-----------|-------|--------|--------|--------|
| Target | Easy | 1 | 1 | 1 | 1,2,3 |
| | Difficult | | | 3 | |
| Walmart | Easy | 3 | 3 | 1 | |
| | Difficult | | 1, 2 | | 1,2,3 |

Easiest Task:

- Walmart: 3
- Target: 1

Most Difficult Task:

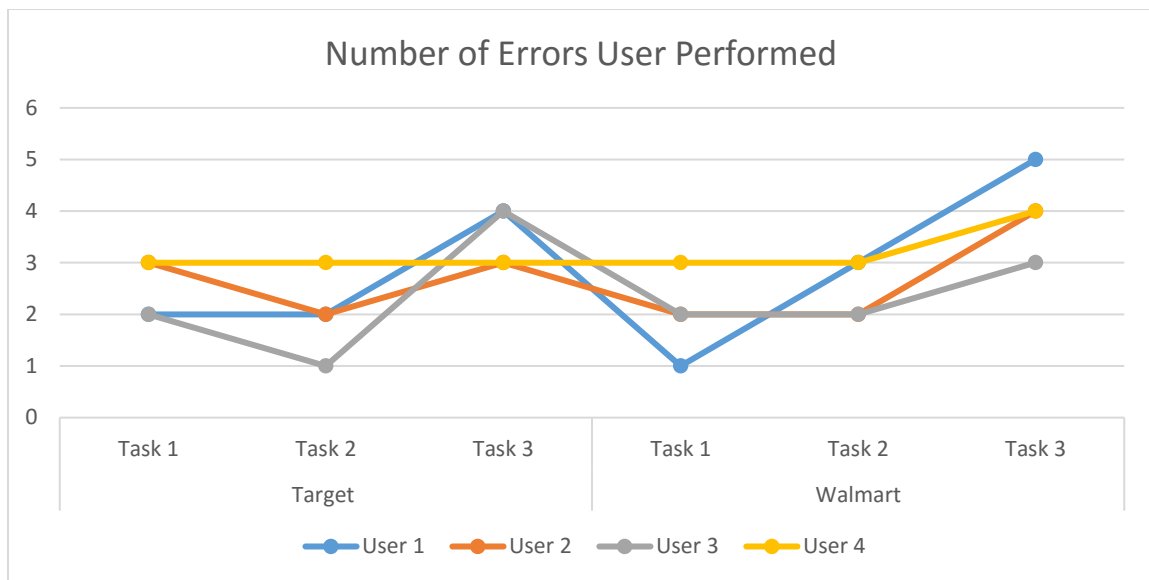
- Walmart: 1, 2
- Target: 3
- **Time taken for performing each task:** The longer it takes to perform a task the more unclear the website is for performing the tasks.



Of the tasks given Task 3 takes the maximum amount of time for both the websites and task 1 takes the least amount of time to perform.

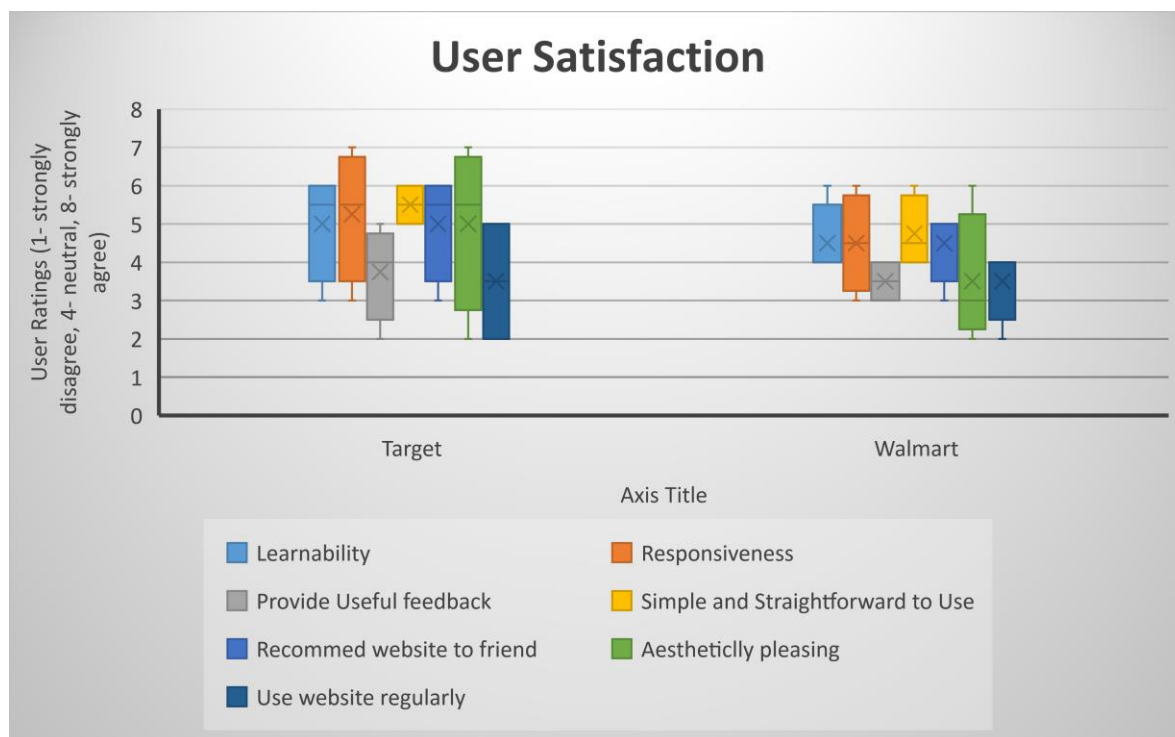
Average Task Completion Time for

- Walmart: 94.17
- Target: 102.25
- **Number of Errors the User encounters:** Errors the user encounters whether in terms of error messages, frustration or questions the user asks.



The task that the users perform with most errors is task 3 for both websites.

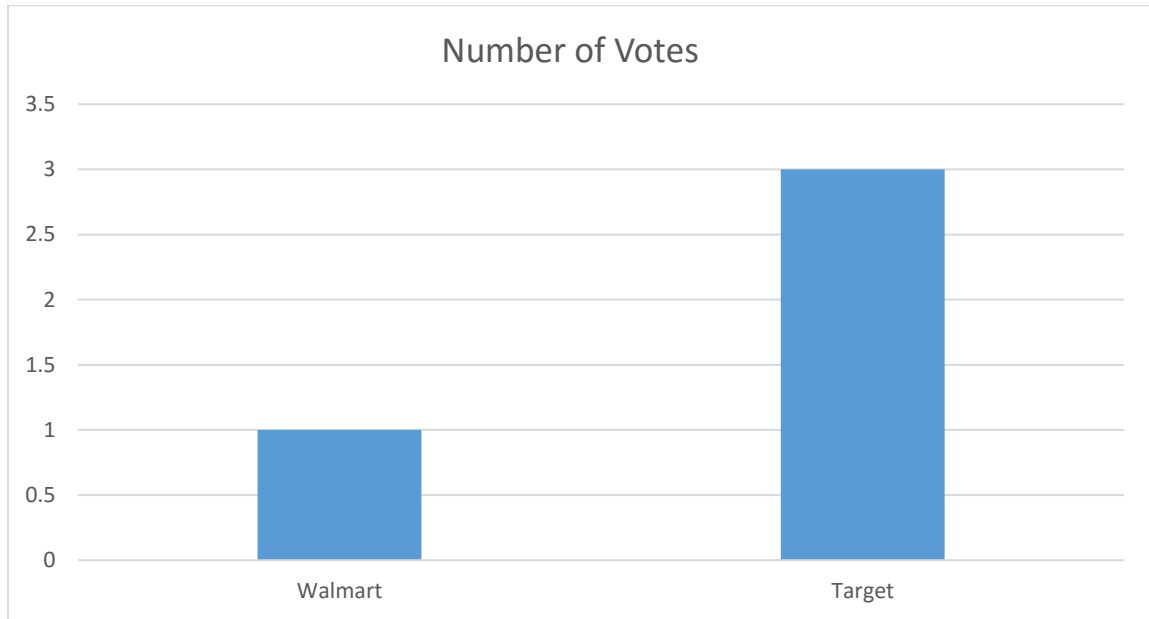
- User satisfaction Metric:** The metric is on a scale of 0-8 where the higher the better. A box plot is used to describe the rating the users have given for the website.



The following are the observations were observed:

- Walmart website provides very poor feedback to the users
- Target fairs better in terms of aesthetically pleasing
- Target is better in terms of ease of learn of using the website
- Target is simpler to use than Walmart

- **User popularity:** In the questionnaire, each user was asked to vote for their most preferred website



About 75% of the users prefer Target over Walmart

Interpretation of Observations:

From the task completion ratio, we can imply that the tasks were not unclear and the users are able to perform the task. But however, with User 3, the user was not able to complete the task 2 due to errors in website. Thus, it is not of much significance since the user was not able to complete the task because of system errors and not because of lack of usability of the website.

From the easy vs difficult task graph, we can infer that the finding the registry was the most difficult task for all the users. And searching for the product is the easiest task. Most of the users spent some time trying to figure out where the registry is and expressed frustration when they were not able to find it. Also, the users felt that the registry involved typing a lot of information. From the answers to the questionnaire the users expressed the need to redesign the screen to have clearer instruction. In the Walmart website one user expressed that he was not able to find the create a registry button since it was scattered among the bunch of other images.

From the time to perform each task, we observe that it correlates with the information we observed from the other graphs. All the users take more time to complete the difficult tasks than the easier tasks. Thus, both the websites need to work on redesigning for Task 3. In terms of other tasks, we observe that Walmart takes less time than Target. This could be because most users were aware of Walmart and claimed to have heard about the website earlier. Also, because the search and filtering task is dependent on how relevant the information provided by the search results.

Since we had measured errors as a cumulative function of the number of error messages the user encounters while performing each task, the questions raised and the frustration passed in their comments. We observe both the websites have almost the same amount of errors while Walmart has around 10% more errors than Target. These reflect in the usability metrics obtained too.

From the user satisfaction perspective, we can observe that Target fairs better than Walmart is all the user satisfaction metrics. Even though the users took more time to complete the tasks in Target website, they

seem to like the look and feel of the website and the website leaves a good impression at the end of the mind.

The factors that we discussed so far holds true when it comes to the votes the users get. Target fairs better than Walmart in terms of popularity also and the reason given by the users predominantly aligns along the line of being aesthetically pleasing.

From the open questions, we infer that Walmart web site was difficult to use for the users. Quoting on such user's comment on the question - If you could change one thing about website what would it be and why? - for Walmart: "Orderliness UI design and tool tip because a layman like me can't understand online shopping easily. Please improve and help". We can notice that people wanted both the websites to have Facebook linked login, so that the time spent on creating account is reduced.

However, User 3 seems like Walmart more than Target. This can be attributed to the inability of completion of Task 2 in Target website. Thus, the user could have felt that Walmart was a better website than target. This, affirms our correlation between completing a task and liking a website.

We can finally conclude from the observation than Target has provided a better user interface than Walmart. Even though Walmart offers a faster website, users are more frustrated in using Walmart website.

Ideas for Improvement:

For Walmart:

From what the users expressed in the questionnaire and during the study, the users didn't find the website appealing because of the overcrowding of data on the website's page. Thus, Walmart needs to focus on reducing the amount of information that they show on the screen.

For example, we noticed that most of the time in creating the registry was spent on trying to find the create a registry button in the registry page.

Also, lack of tool tip and help layovers makes it difficult for the user to perform tasks when they are unfamiliar with the website. The need for user to enter a lot of details during account and registry creation further adds to the frustration of the user.

Once the registry is created, it was not clear to the user where to find the list created. Only a confirmation message appeared on the screen. The registry was not displayed on the webpage which was the expectation of the user. It took the user sometime to realize that he must click on "Manage Registry" to view his created registry.

Also, users complained about the lack of having a Google or a Facebook login for logging into the page. Since the website did not allow to single sign on with existing account, they had to enter the details again.

For Target:

Even though, the website is aesthetically pleasant. The website is not as fast as Walmart. It is because of this reason that the users take more time to complete the same task. For example, since the users had to find the cheapest sticky notes based on the results it took some time for them to find the exact product. This is one area that the website can work on. But since it is on the back end it is not of much relevance to our studies.

One of the users had suggested that the website use more colors. This could be because Red is predominantly used throughout the website and there is a lot of white space. I don't think this needs to be changed.

Like Walmart, users complained about the lack of having a Google or a Facebook login for logging into the page. Since the website did not allow to single sign on with existing account, they had to enter the details again.