

Expert Usability Evaluation Assessment On Two E-commerce Websites Using Cognitive Walkthrough Method

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The paper presents a case study of GUI (Graphical User Interface) quality testing between two online shopping portals. The study aimed to assess the user experience using the cognitive walkthrough method and collate it with expert opinions. In this study, there were two significant findings. First, the result showed successful and unsuccessful features; pain points, and problems like simplicity, consistency, familiarity that prevent users from accomplishing their goals. The absence of any of these key factors may diminish the usability of web portals. Second, one of the vital causes to decrease the conversion rate is the lack of simplicity of the checkout design that prevents consumers from purchasing from the marketplace.

1 INTRODUCTION AND BACKGROUND

E-commerce is one of the fastest-growing markets where consumers from all over the world flock to the internet to make purchases. It has become a much easier way to shop considering that it does not require leaving the house. Since having previous knowledge about online shopping is one of the significant concerns to purchase products online, it is important to design an interactive website that will serve a good user experience and feel comfortable performing their tasks [1].

For the experiment, two portals have chosen for usability evaluation. "Aarong" (<https://www.aarong.com/us/>) is one of the most popular physical stores in Bangladesh, specializing in Bengali ethnic wear and handicrafts [2]. In recent times, "Aarong" officially embarked on their online store for the consumers where people from Bangladesh and the USA can order products online instead of visiting the outlets (see figure.1 (a)). Another portal named "Overstock.com" (<https://www.overstock.com/>) is one of the most popular online e-commerce marketplace which was founded in the USA (see figure.1 (b)). It continues to sell home decor, furniture, bedding, and many other goods that are closeout merchandise [3]. In recent times, both stores are gaining their popularity to the buyers, so it needs good usability that will attract more potential buyers and increase sales with minimum expenses on advertising. Furthermore, a good user experience can improve the conversion of visitors to buyers. If any users are looking for some item to view/ purchase, "Aarong" and "Overstock.com" let them find their desired items from the menu or using the search option. For adding products to the cart, both websites allow users to proceed to checkout providing all personal information and shipping details. Along with this, there are some other similarities like creating an account, adding items to wishlist, international shipping, managing orders, and other essential tasks that are most common in any online shopping website. As both sites can avail their purpose to the users, it will help for making a good analysis for the experiment.

2 STUDY DESIGN

In this study, the cognitive walkthrough technique was selected to discover potential usability problems of the website in the early stage of the design. Also, it helps to find reasons behind the problem with possible solutions. This study aims to answer the flexibility of the UX and customer journey to the user [5]. It involved both qualitative and quantitative analysis for two e-commerce websites. To accelerate the study, the CW method involves several scenarios containing tasks to perform for users (see Study-Material:5.1).

For collecting the quantitative data, some measurements were taken to observe the design of the website that serves the

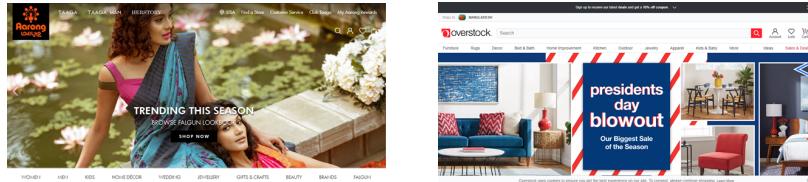


Fig. 1. (a) Screenshot of the web-page of Aarong ([//www.aarong.com/](http://www.aarong.com/)), (b) Screenshot of the web-page of Overstock ([//www.overstock.com/](http://www.overstock.com/))

good usability to the user. For example, this study found how many errors, steps, alternative ways, and the time required to complete the tasks. The estimation of these data accomplish usability criteria, which will be analyzed from the CW feedback. Also, the comparison between two websites statistical data helped to identify successful and unsuccessful features and problems that prevent users from completing their tasks.

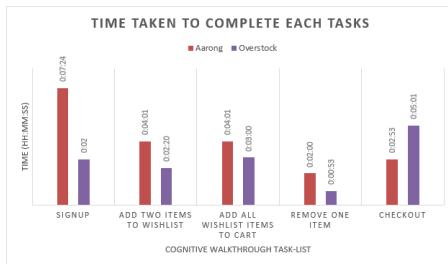
For collecting qualitative data, an exit interview was taken for the users that includes UX questions, where participants evaluate their own subjective experience of the interaction. While performing the tasks by end-users, at each step user answered four questions, i.e., *will the user know what to do, will the user know how to do it, were you able to complete the task, and when the action is completed, will the user understand whether they did the right thing*. These measurements were taken using qualitative nominal data on the “YES/NO” scale (see Study-Material:5.2). This data was collected to know if the new design indicates clearly what users can do on the website and how to accomplish their goals. Also, the data gave information about conversion techniques that can convert viewers to consumers. During a Cognitive Walkthrough, a usability expert evaluates an interactive system from the user’s point of view by putting himself in the role of a consumer. In this study, I considered myself as a user and expert to evaluate the tasks performed by the end-user(myself). What kind of simplicity, consistency, familiarity serves the website to the first time user were the key things to evaluate as an expert.

3 RESULTS

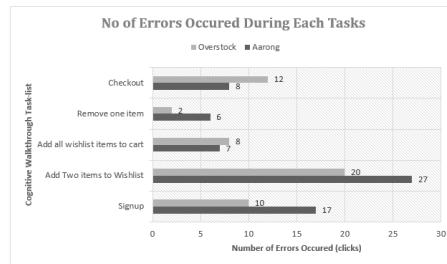
Results of the case study are divided into two parts. For qualitative analysis, exit interviews at each step of the tasks were performed by the user. The results of the exit interview contain nominal qualitative data (see Study-Material:5.2) concerning user experience about the tasks, understanding the feature of the website is successful to satisfy the customer, user guidance to complete the task. Though both the websites had some similarities and pitfalls, but participant liked “Aarong” more than “Overstock” considering a few points. “Aarong” had minimum user inputs in the checkout section (see figure.11.c in study material) where “Overstock.com” user had to provide so many inputs for billing and personal information (see figure.20 in study material). Through guest user login is a good feature for any online shopping portals, but “Overstock.com” failed to navigate the user to view their wishlist items as a guest user (see figure.23 in study material). It requires less time and steps to create a new user account in “Overstock.com” than “Aarong”. It was hard to find the right way to purchase any items from both of the websites, so it does not convert the user to a buyer efficiently (see figure.11 & figure.20 in study material).

For this experiment, both websites had some quantitative measurements based on the user experience while performing the tasks. There were some measurement criteria, firstly required time to complete the tasks. Here, Aarong took the maximum time (07:24 minutes) (see figure.2(a)) for “Sign up” which includes 12 steps (see figure.2(c)) to complete

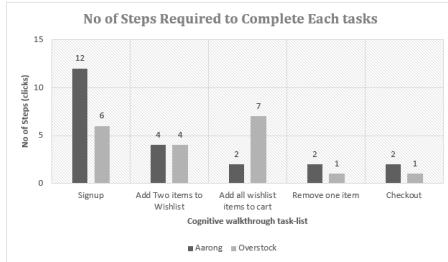
the registration as a new user. And while creating a new account, the user made 17 errors (see figure . 2(b)) to navigate the sign-up icon and did not get the OTP (One-time-password) for the first time. The system took several minutes to send the code to the user's phone number. Conversely, signing up was easier in "Overstock" compared to "Aarong" because it took 02:00 minutes to create a new account (see figure .2(a)) which was three times less than the "Aarong" sign-up processing time. Also, in Overstock it required half of the steps (6) to complete the task (see figure .2(c)). For both websites four steps were common to add items to the wishlist (see figure .2(a)). but "Aarong" is tougher to complete the task than "Overstock". Because the number of errors that occurred during the tasks was 27 and 20 respectively (see figure .2(b)). Aarong had three alternative ways for sign up and Overstock had three alternative ways for checkout (see figure .2(d)). The following graphs show all the findings:



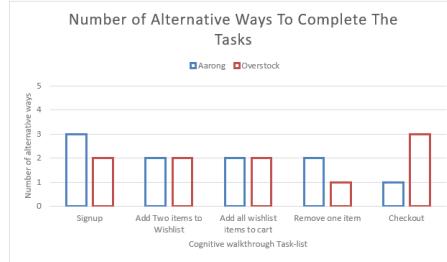
(a) Time taken for each task



(b) Number of errors occurred during the tasks



(c) Number of steps required to complete the tasks



(d) Alternative ways to complete the tasks

Fig. 2. Quantitative data analysis between two online e-commerce websites

4 DISCUSSION AND CONCLUSION

Based on the findings from the inspections of the study it suggests that the pragmatic quality (i.e. the usability) of the websites are average, but there are some areas of improvement for increasing the hedonic quality of the interaction (i.e. user experience). Firstly, for finding a good user experience, "Aarong" is more usable than "Overstock.com" in the user experience questionnaire. In "Overstock", one surprising fact was found that while adding any product to the wishlist, it showed to add that product to a customise category. But surprisingly, after adding the product into a customized category, this category name could not be found anywhere on the website (see figure .14.b in study material). In this study, users have faced several difficulties identifying icons, and also it took time to interact with the websites. The overall study includes human cognition of what we have discussed in the class.

Understanding UX, online customer journey, and consumer decision-making processes on a website help to understand what are the pain points and problems that prevent users from performing tasks or accomplishing their goals[4]. The study indicates that “Aarong” can facilitate good UX but,it could be better. Secondly, for finding the ability to convert a user’s mentality as a buyer, the shopping process on “Overstock.com” was more difficult than “Aarong”. My recommendation towards the online retailers that they should work strategically to maximize their website performance, especially on product pages. Websites should not force users to create a new account unless they are giving any advantages. The number of participants contributes a significant role in the result. The result could be more promising in case of fewer constraints like more survey users, participants from different backgrounds, and more time to evaluate the sites for experts’ evaluators. Besides, adding more members to the expert evaluator team might change the currently stated overview of the websites, which could provide more suggestions for improvement. In this study, I have only focused on the basic functionality of those sites. In the future, I would like to stretch more on the complex functionality of the websites i.e. the intelligence system, customer support using the chatbot.

REFERENCES

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- [5] Plechawska-Wojcik, M.; Lujan Mora, S. and Wojcik, L. (2013). Assessment of User Experience with Responsive Web Applications using Expert Method and Cognitive Walkthrough - A Case Study.In Proceedings of the 15th International Conference on Enterprise Information Systems - Volume 1: ICEIS, ISBN 978-989-8565-61-7, ISSN 2184-4992, pages 111-118. DOI: 10.5220/0004443001110118.

5 STUDY MATERIAL

To facilitate the study, the cognitive method involves several scenarios containing tasks to perform for users. Each steps of the Cognitive walkthorugh process for "Aarong" //www.aarong.com/ is given below:

5.1 Cognitive walkthrough task-list for Aarong

- (1) Sign up: User needs to create his/ her account to record customer information - see figure.3 and figure.4.
- (2) Adding to wishlist: User needs to add two items from "Ring" category- see figure.5 and figure.6
- (3) Working with the wishlist: User needs to add all wishlist items to cart- see figure.7, figure.8 and figure.9
- (4) Remove one item: User needs to remove one item from the cart- see figure.10
- (5) Checkout: User needs to provide every required information to confirm the purchase- see figure.11

To facilitate the study, the cognitive method involves several scenarios containing tasks to perform for users. Each steps of the Cognitive walkthorugh process for "Overstock.com" //www.overstock.com/ is given below:

5.2 Cognitive walkthrough task-list for Overstock

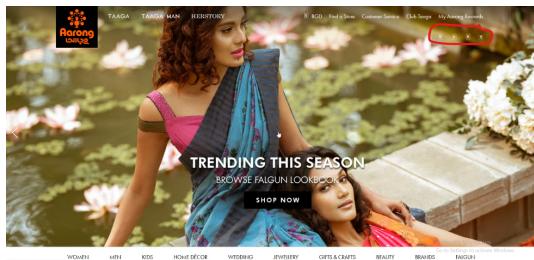
- (1) Sign up: User needs to create his/ her account to record customer information - see figure.12 and figure.13
- (2) Adding to wishlist: User needs to add two items from "Ring" category- see figure.14 and figure.15
- (3) Working with the wishlist: User needs to add all wishlist items to cart- see figure.16 and figure.17
- (4) Remove one item: User needs to remove one item from the cart- see figure.18
- (5) Checkout: User needs to provide every required information to confirm the purchase- see figure.19

5.3 Qualitative Analysis

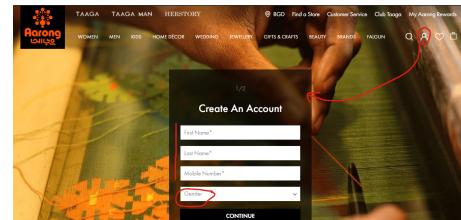
Please see figure.22

5.4 Guest User Login Feature

Please see figure.23



(a) Initially there was no icon to find the "Sign-up" button



(b) After few time, it loads the icons and then user clicked on Sign Up

This screenshot shows the "Create An Account" step 1 form. It includes fields for First Name*, Last Name*, and Mobile Number*. Below these is a dropdown for Gender and a "CONTINUE" button. At the bottom, there's a link to log in if already registered.

(c) There are 3 required fields only in this step

This screenshot shows the same form after pressing the "CONTINUE" button. The "Gender" field is now highlighted with a red border, and an error message "This field is required." is displayed below it. The "CONTINUE" button is now orange.

(d) When pressed continue it said gender is required

Fig. 3. Sign up: User needs to create his/ her account to record customer information. First cognitive task for "Aarong" (Step 1)

2/2

Create An Account

Email*

Date of Birth*

Create Password* eye icon

Confirm Password* eye icon

I agree to Aarong's [Terms & Conditions](#)

SUBMIT

Already have an account? [Login Now](#)

(a) This is second page for sign up 2

2/2

Create An Account

sahaprojna@gmail.com

02/6/1996

eye icon

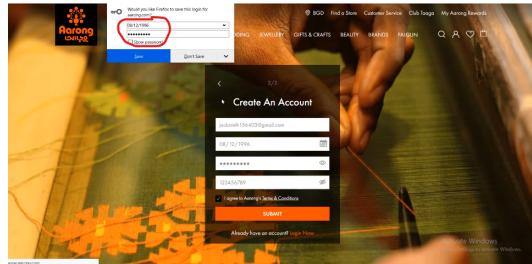
eye icon

SUBMIT

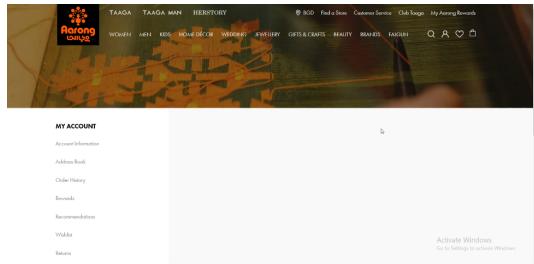
Already have an account? [Login Now](#)

Minimum length of this field must be equal or greater than 6 symbols. Leading and trailing spaces will be ignored.

(b) There was no password rules declared initially, but later it showed an error message



(c) It saved the password against dob



(d) After creating the account, it redirects to the dashboard with no user information

Fig. 4. Sign up: User needs to create his/ her account to record customer information. First cognitive task for "Aarong" (Step 2)

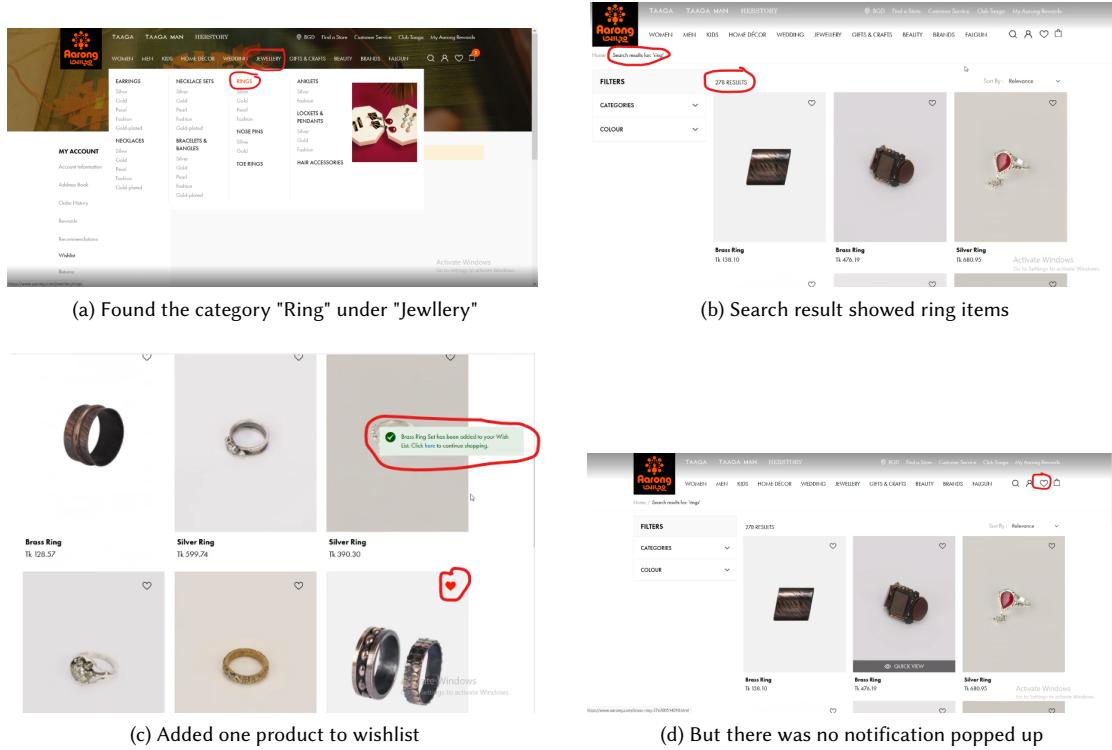


Fig. 5. Adding two items to wishlist: User needs to add two items from “Ring” category. Second cognitive task for “Aarong”

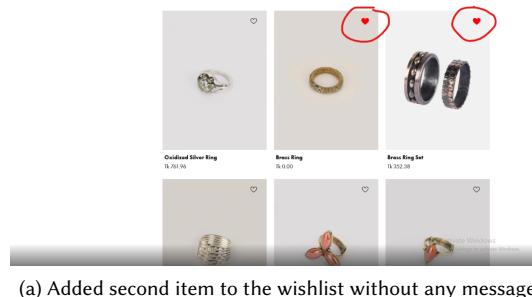


Fig. 6. Adding two items to wishlist: User needs to add two items from “Ring” category. Second cognitive task for “Aarong” (continue)

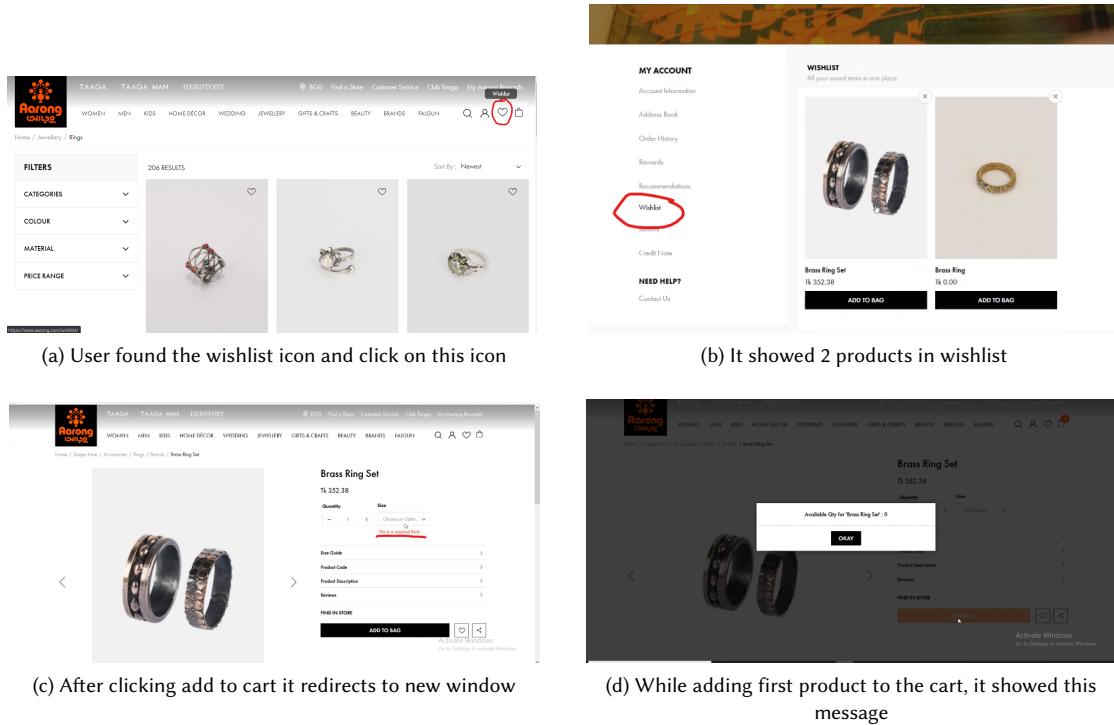


Fig. 7. Working with the wishlist: User needs to go to the wishlist and select all items to Cart. Third cognitive task for "Aarong"

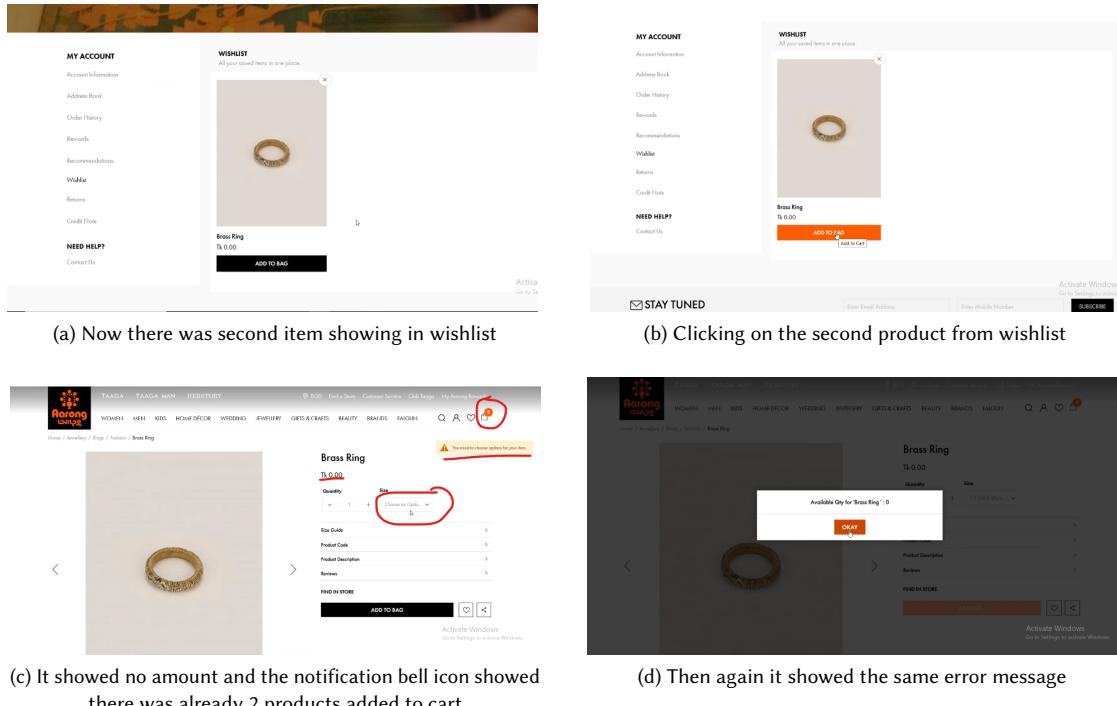


Fig. 8. Working with the wishlist: User needs to go to the wishlist and select all items to Cart. Third cognitive task for "Aarong"

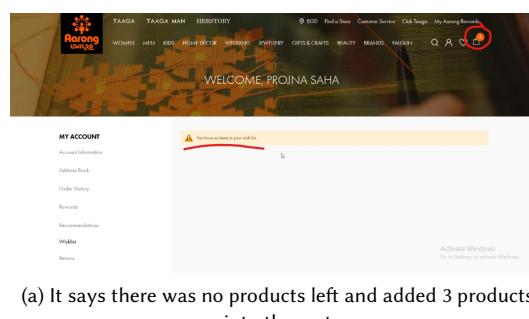


Fig. 9. WWorking with the wishlist: User needs to go to the wishlist and select all items to Cart. Third cognitive task for "Aarong"

(a) It says 3 quantities added in the cart

(b) There was 2 items in the cart quantity

(c) Successfully removed one product from the cart

Screenshot (a): Shopping Cart View

The screenshot shows a shopping cart with three items: "Recycled Handmade Paper Shopping Bag" (Tk 70.00), "Recycled Handmade Paper Shopping Bag" (Tk 70.00), and "Recycled Handmade Paper Shopping Bag" (Tk 75.00). The total subtotal is Tk 704.76. The quantity for each bag is circled in red.

Screenshot (b): Order Summary View

The screenshot shows the order summary with two items: "Brass Ring Set" (Tk 33.24) and "Brass Ring" (Tk 6.00). The quantity for the ring set is circled in red.

Screenshot (c): Shopping Cart View After Removal

The screenshot shows the shopping cart with only one item: "Brass Ring" (Tk 6.00). The quantity is circled in red.

Fig. 10. Remove one item: User needs to remove one item from cart. Fourth cognitive task for "Aarong"

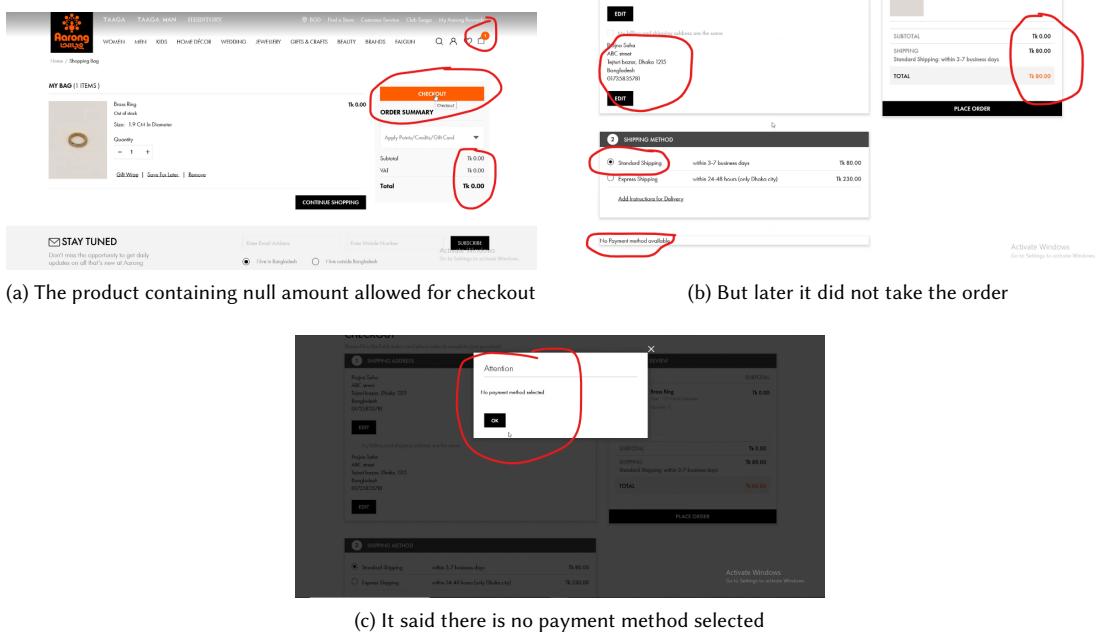
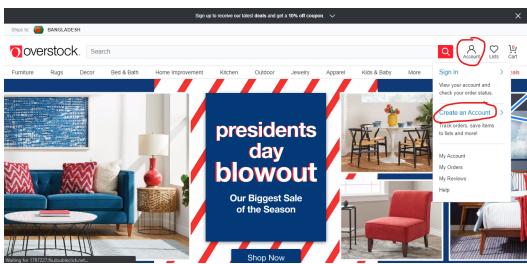
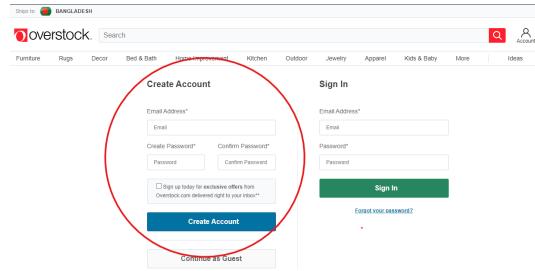


Fig. 11. Checkout: User needs to proceed to checkout. Fifth cognitive task for "Aarong"



(a) Landing page of overstock and easy to find sign up option



(b) It required only three fields

Create Account

Email Address*

sahaprojna@gmail.com

Create Password*

Password

Confirm Password*

Confirm Password

sahaprojna@gmail.com
.....
from
inbox**

Suggest strong password...

Manage passwords...

Continue as Guest

(c) Suggested strong password

& Bath

Home Improvement

Kitchen

Outdo

Create Account

Email Address*

sahaprojna@gmail.com

Create Password*

.....

Confirm Password*

.....

Sign up today for exclusive offers from
Overstock.com delivered right to your inbox**

Create Account

(d) After clicking on suggesting password it automatically filled up the password fields

Fig. 12. Sign up: User needs to create his/ her account to record customer information. First cognitive task for "Overstock"

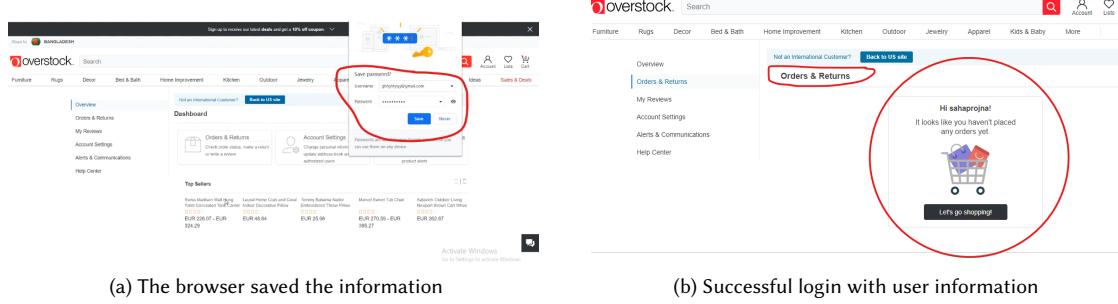


Fig. 13. Sign up: User needs to create his/ her account to record customer information. First cognitive task for "Overstock" (continue)

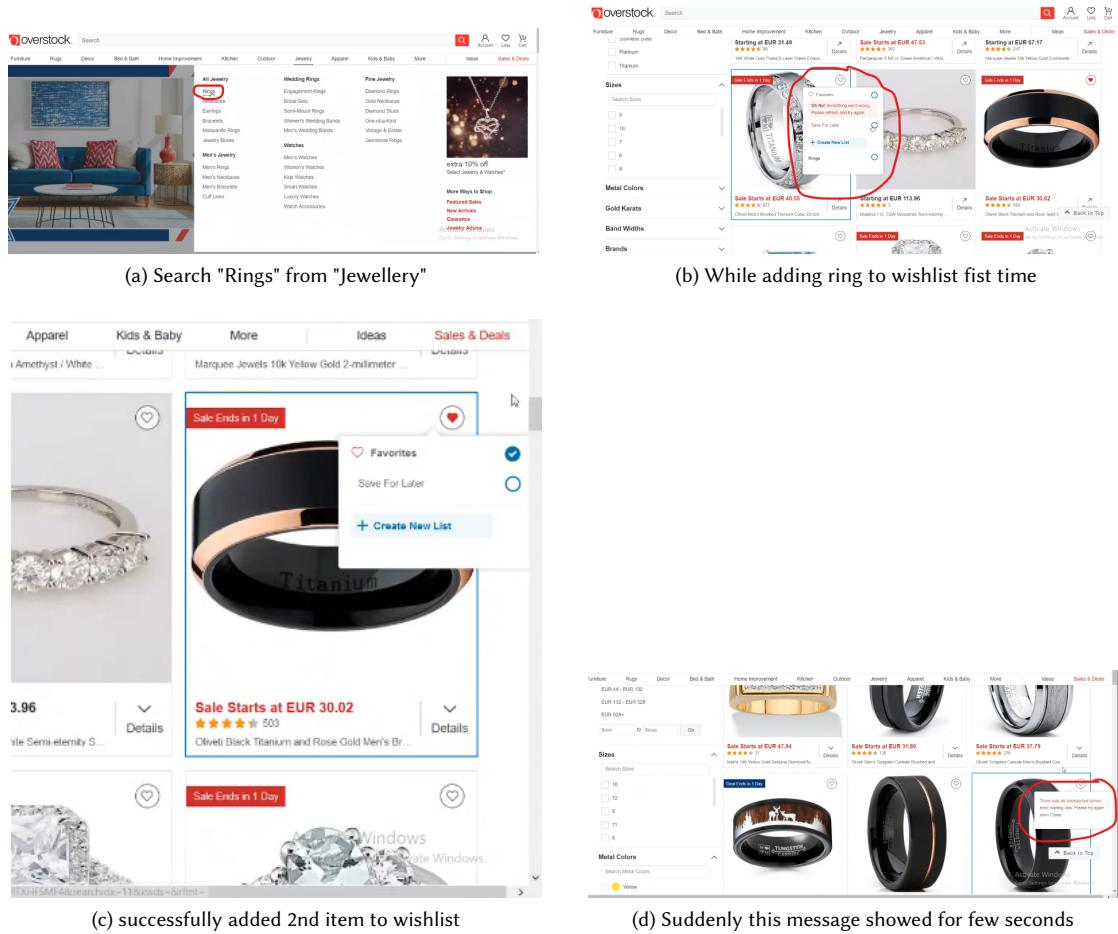


Fig. 14. Add to wishlist: User needs to add two items from "Ring" to wishlist. Second cognitive task for "Overstock"

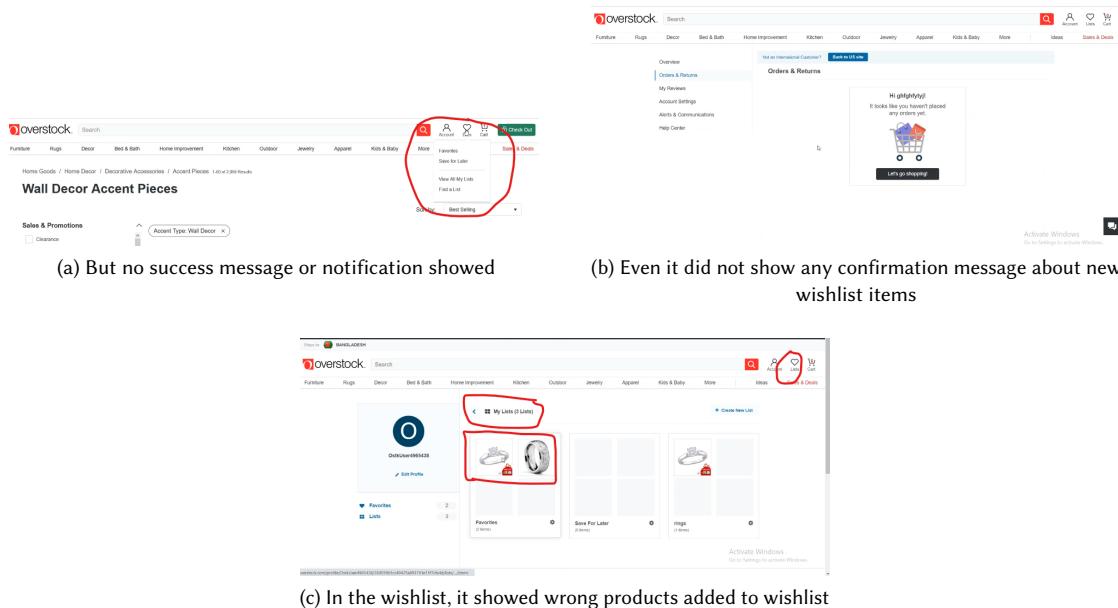


Fig. 15. Add to wishlist: User needs to add two items from "Ring" to wishlist. Second cognitive task for "Overstock" (continue)

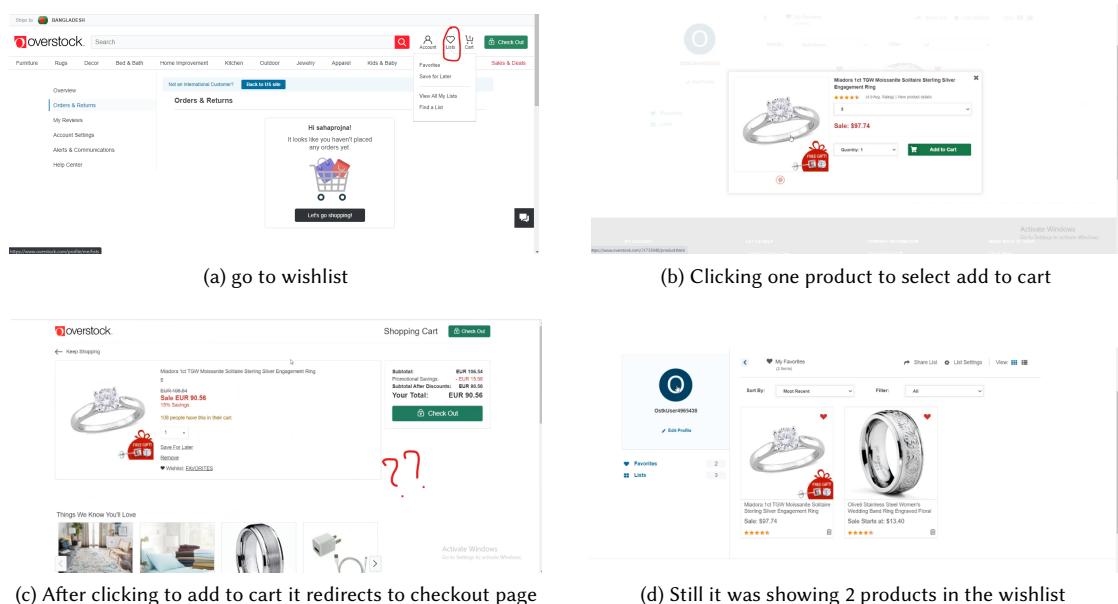


Fig. 16. Working with wishlist: User needs to add all wishlist item to cart. Third cognitive task for "Overstock"

(a) Select size for the second product

(b) Successfully added to cart now

Fig. 17. Working with the wishlist: User needs to add all wishlist item to cart. Third cognitive task for "Overstock" (continue)

(a) There was a remove option and user removed it

(b) It remained one item in the list

Fig. 18. Remove one item: User needs remove one product from the cart. Fourth cognitive task for "Overstock"

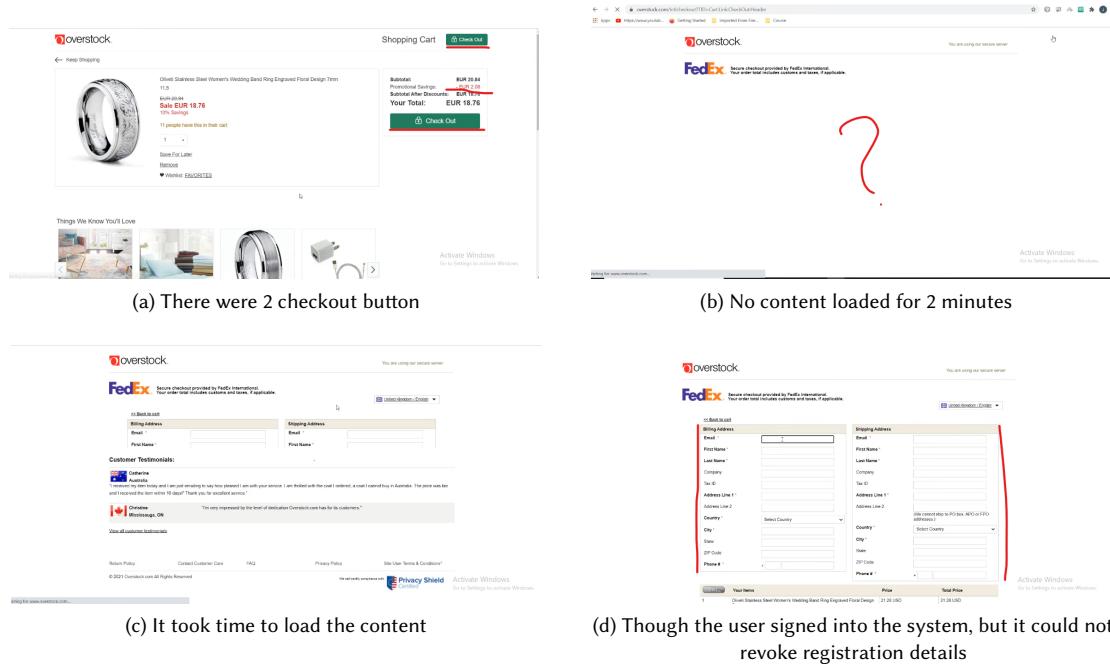


Fig. 19. Checkout: User needs to proceed to checkout. Fifth cognitive task for "Overstock"

(a) While user started to providing the information, the system made some errors

(c) User selected the PayPal as a method of payment

(d) But for country it was not possible to pay through PayPal

Fig. 20. Checkout: User needs to proceed to checkout. Fifth cognitive task for "Overstock" (continue)

(a) After selecting the "PayPal" option, there was no content in the page

Fig. 21. Checkout: User needs to proceed to checkout. Fifth cognitive task for "Overstock" (continue)

Table: Qualitative analysis of two e-commerce websites, "Aarong" & Overstock

Cognitive Walkthrough Task-list	Aarong				Overstock			
	Will the user know what to do?	Will the user know how to do it?	Were you able to complete the task?	When the action is completed, will the user understand whether they did the right thing?	Will the user know what to do?	Will the user know how to do it?	Were you able to complete the task?	When the action is completed, will the user understand whether they did the right thing?
Sign Up	Yes	No	Yes	No	Yes	Yes	Yes	No
User needs to add to two items to wishlist from "Ring"	Yes	Yes	Yes	Yes	No	No	Yes	No
Navigate to wishlist and all items to cart	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Remove one item from cart	Yes	Yes	Yes	YES	Yes	Yes	Yes	Yes
Checkout	Yes	Yes	No	No	Yes	No	No	No

Fig. 22. Qualitative analysis between two online e-commerce websites

(a) After selecting the wishlist icon as a user, it redirects to the login UI

(b) It is saying that the cart is empty, but there is no wishlist

Fig. 23. Checkout: User needs to proceed to checkout. Fifth cognitive task for "Overstock" (continue)