

Enhancing User Experience through Interface Update

– A Case Study of CBC News
Comment Section

Tina L Cao

Abstract

The digitalization trends have profoundly reshaped user interactions on online platforms, necessitating thoughtful design and updates to mitigate cognitive workload.

In this study, we focus on the interface update of CBC News, specifically transitioning the comment sections within articles into pop-up windows. This change aims to streamline user engagement and reduce cognitive workload by maintaining context and minimizing cognitive switching.

Utilizing principles of user-centered design, we conducted an experiment to assess the impact of this interface update on user experience. Using our research platform, we simulated interactions with both the original and updated interfaces to gauge user responses and gather feedback. Preliminary findings indicate a positive reception towards the pop-up window design, with users reporting reduced memory workload and enhanced engagement.

Furthermore, our analysis highlights the importance of seamless navigation aids and intuitive design elements in facilitating user interactions within digital interfaces. While the transition to pop-up windows proved efficacy in reducing cognitive load, considerations for optimizing navigation aids remain crucial for enhancing overall user experience. This study underscores the significance of user-centered design principles in optimizing interfaces for usability and satisfaction for online news platforms.

Keywords

CBC News; Interface Update; User experience; Cognitive load; User-centered design; Digital interface

Introduction

The selection of the CBC News interface for this study was motivated by its expansive user base and its status as a prominent global news outlet. CBC News caters to a diverse audience, offering comprehensive coverage across a wide array of topics.

However, a specific aspect of the interface warranted scrutiny and improvement: the comment section within articles. As depicted in *Figure 1*, prior to the update, users encountered difficulty when attempting to engage with comments, as they were compelled to navigate to the bottom of the page where the comment section was situated, blending amidst other content.

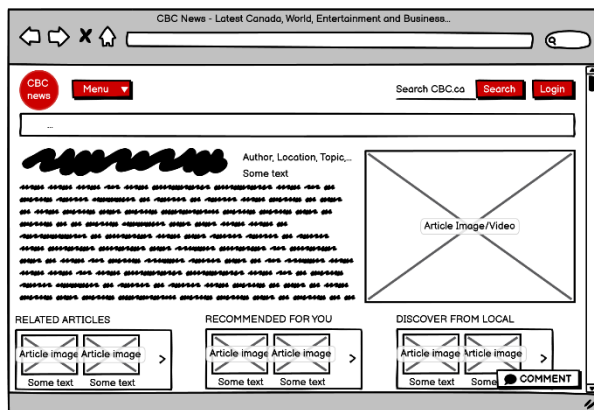


Fig. 2. Updated layout of comment section

Expanding upon this enhancement, there are some more refinements introduced to optimize the interface layout. The redesign initiative was undertaken with the objective of improving the organization of content and enhancing visual aesthetics on the CBC News platform. The overhaul of the main page layout specifically aimed at consolidating user-interest topics and minimizing the time users might allocate to locating particular content. By integrating principles of symmetry into the design, the revamped layout accentuates visual balance and coherence, thereby contributing to a more aesthetically pleasing user interface. These refinements are hypothesized to decrease users' cognitive workload by improving user engagement and comprehension, resulting in a more efficient and satisfying browsing experience.

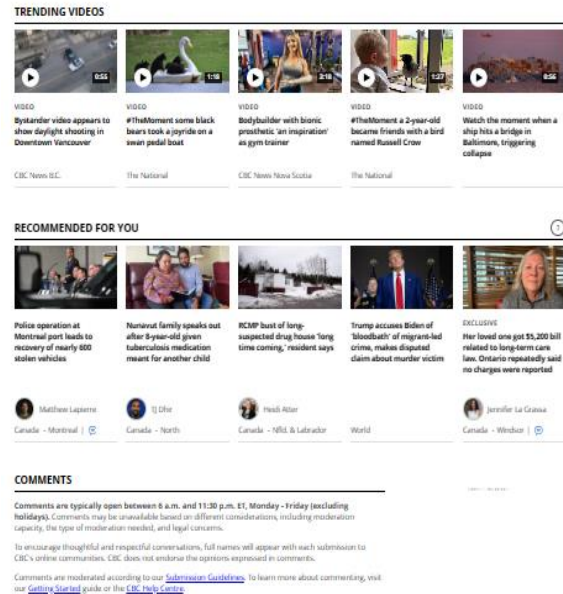


Fig. 1. Comment section in articles

The objective of this study was to enhance the visibility and accessibility of the comment section by transitioning it into a pop-up window. This initiative aimed to solve the identified usability issues and provide users with a more intuitive and seamless commenting experience. Given the dynamic nature of user comments, ensuring a seamless comment section interface is imperative. By separating the comment section into a pop-up window, users can now leave comments and engage with others while browsing articles more seamlessly (see *Figure 2*).

Background

In the contemporary digital landscape, user experience (UX) stands as a critical determinant of success for online platforms. Recent research highlights the significant impact of website visual design on user perceptions and behaviours, emphasizing the importance of creating visually appealing and user-friendly interfaces.

A body of research consistently demonstrates that visually appealing designs significantly contribute to enhanced usability and pleasantness among users. This positive user experience, characterized by ease of navigation and aesthetic appeal, fosters favourable evaluations of the website, including perceived value, intention to reuse, and intention to recommend [1]. Thus, optimizing the visual design of online interfaces is essential for enhancing user satisfaction and engagement, increasing audience retention and reach.

The incorporation of symmetry principles into interface design introduces notable benefits for user interaction and engagement. By adhering to symmetrical layout elements and balanced placement of interface elements, users can efficiently navigate interfaces, fostering a sense of harmony and order conducive to seamless exploration of content [2, 4, 5]. Cairns and Thimbleby (2008) highlighted the significance of symmetry in interfaces, noting that symmetrical elements suggest actions to users, enhancing intuitive navigation and interaction [2]. Consequently, symmetrical design elements effectively guide users through interfaces, facilitating a smoother and more engaging user experience.

Moreover, insights gleaned from behavioral analysis studies, especially those concentrating on task sequencing and workload management [3], emphasize the importance of understanding user behaviors and preferences to inform design decisions. Research suggests that analyzing task behaviours and transitions offers valuable insights into user strategies, enabling designers to implement features aimed at reducing cognitive load during interaction [3]. This approach allows users to defer interruptions until moments of lower mental workload, ultimately enhancing overall user engagement and satisfaction with digital platforms.



Fig. 3. CBC logo, example of symmetry

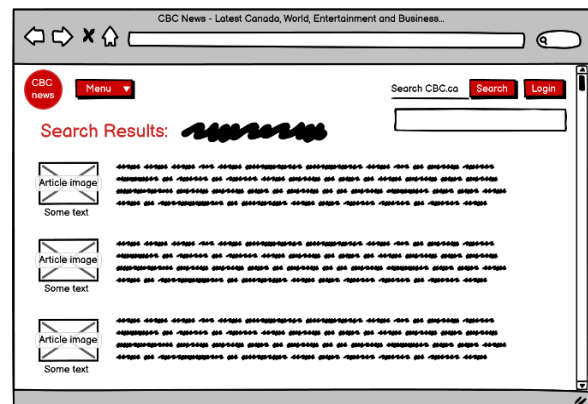


Fig. 4. Updated interface, symmetry applied

Methods

In the conducted experiment, a total of five experienced users were engaged, consisting of three adults within the age range of 20-50 and two seniors aged 60-80. This diverse demographic composition aimed to provide comprehensive insights reflective of various age groups that could potentially utilize the interface.

Participation prerequisites included proficiency with basic equipment such as a computer or a laptop connected to the internet, installed Zoom and a notepad app, a mouse, and a keyboard, as well as the ability to effectively respond to a questionnaire. The experiment was executed remotely through the Zoom platform. Following a within-subject design, each participant was tasked with interacting with both the original interface and an updated iteration fashioned using Wireframe.

Participants were meticulously briefed on the experimental protocols, ensuring they had prior experience with the interface. This experience allowed them to have a clear understanding of the tasks involved and what the experiment aimed to achieve.

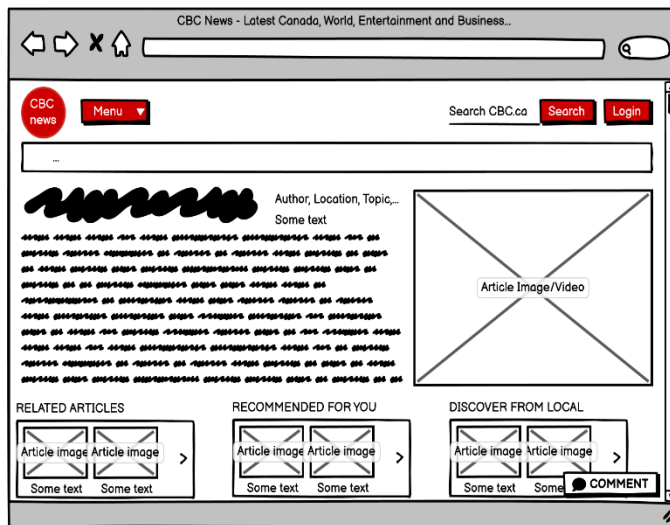


Fig. 5. Updated interface, Article page

The procedure for engaging with the original interface involved selecting an article of interest, reading its content, scrolling down to locate the comment section, clicking on the text field of the comment section, typing in their thoughts, and submitting their comments. In contrast, the interaction with the updated interface differed in that participants had the flexibility to read the article and concurrently type their comments as they progressed through the content. The time used for each subtask will be collected.

However, an unforeseen discrepancy emerged during the first experiment as the participant discovered the updated interface was not capable of receiving user-typed and submitted comments.

In response, participants were instructed to open a notepad on the laptop, treating it as a placeholder for the pop-up window intended for the comment section (see figure 5). This adaptation allowed participants to simulate the act of typing and submitting comments within the context of the updated interface.

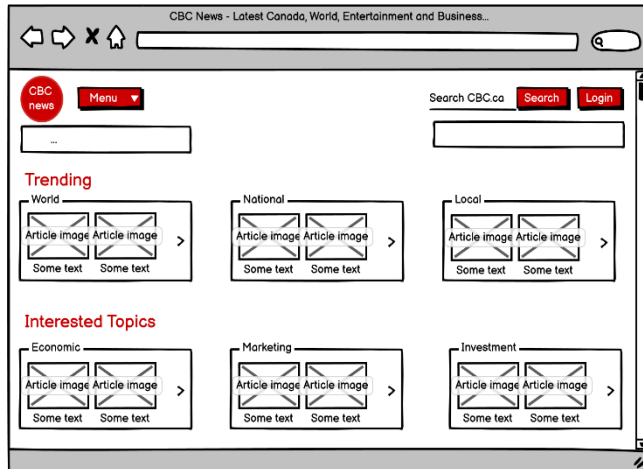


Fig. 6. Updated interface, Main page

Subsequently, participants provided feedback via a semi-structured questionnaire comprising ten questions.

These questions were strategically designed to gauge participants' perceptions pertaining to interface enhancements, the ease of comment submission, the visibility of the comment section, satisfaction with the overall layout, identification of notable updates, encountered technical challenges, intentions regarding future interface usage, preferences between the original and updated versions, and recommendations for further enhancements. (see Figure 7,8)

The experiment's independent variable encompasses the original interface and its updated counterpart, while the dependent variable centered on the time taken by participants to fulfill predefined tasks.

1. Do you think the layout of interface improved? *

☐ Yes

☐ No

2. Was it easier to leave a comment using updated interface? *

☐ Yes

☐ No

3. Did you find the comment section easier to locate? *

☐ Yes

☐ No

4. Which version has a better comment section?

☐ Original interface

☐ Updated interface

5. How would you describe your experience with the overall layout of the article page? *

Your answer _____

Fig. 7. Questionnaire form (1)

6. Is there any specific update that stood out to you? *

Your answer _____

7. Did you encounter any technical issues or errors while using CBC News? *

Your answer _____

8. Will you continue to use the updated version of CBC News in the future? *

☐ Yes

☐ No

☐ Not sure

9. Did you prefer the original version or the updated version? Why? *

Your answer _____

10. Any suggestions for the updated version of CBC News? *

Your answer _____

Thank you for participating!

Fig. 8. Questionnaire form (2)

Result

The analysis utilized multiple statistical methods to thoroughly examine the dataset. These included Box Plot analysis, paired samples statistics, descriptive statistics, Q-Q plots, and the one-sample Kolmogorov-Smirnov test to assess variable distributions.

Significant differences in response time distributions between the original and updated interfaces were evident in the Box Plot analysis. The Box Plot of the original interface displayed a balanced distribution without noticeable skewness. In contrast, the plot for the updated interface showed a downward skew, as indicated by a shorter line on the lower y-axis.

This discrepancy suggests potential differences in the performance characteristics of the two interfaces. The downward skewness in the Box Plot for the updated interface implied a lower median response time compared to the original interface. The absence of significant outliers in the results suggests a consistent spread of data within each interface's response time distribution.

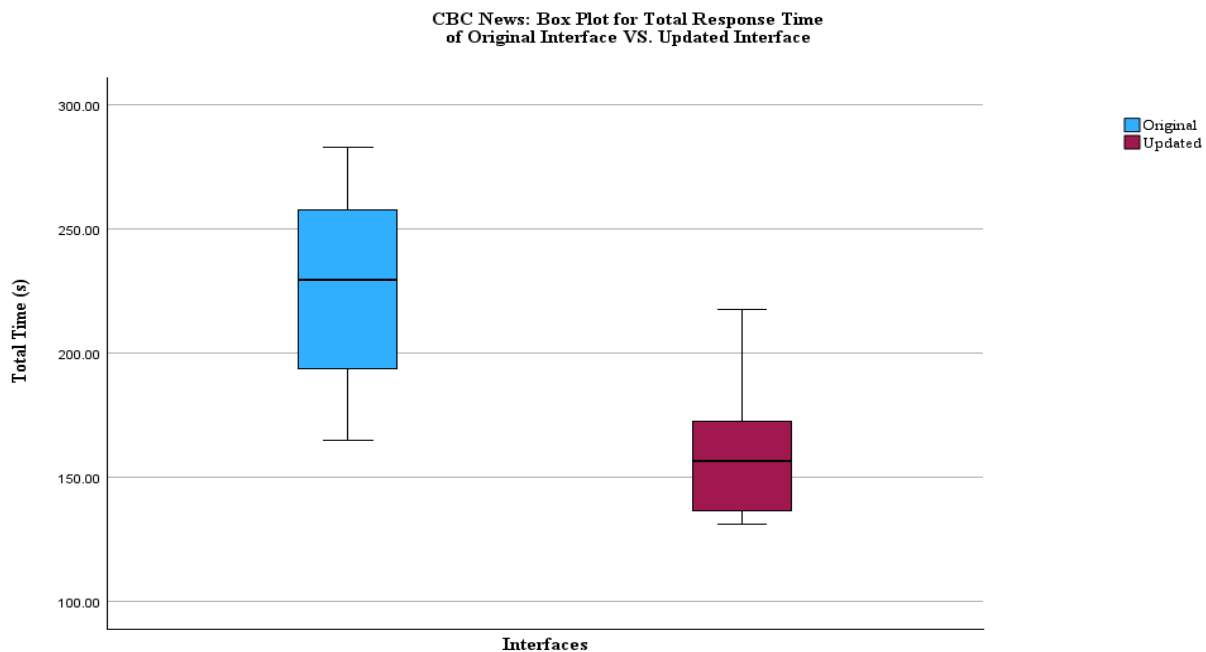


Fig. 10. Box Plot - Comparing the total time spent on both interfaces

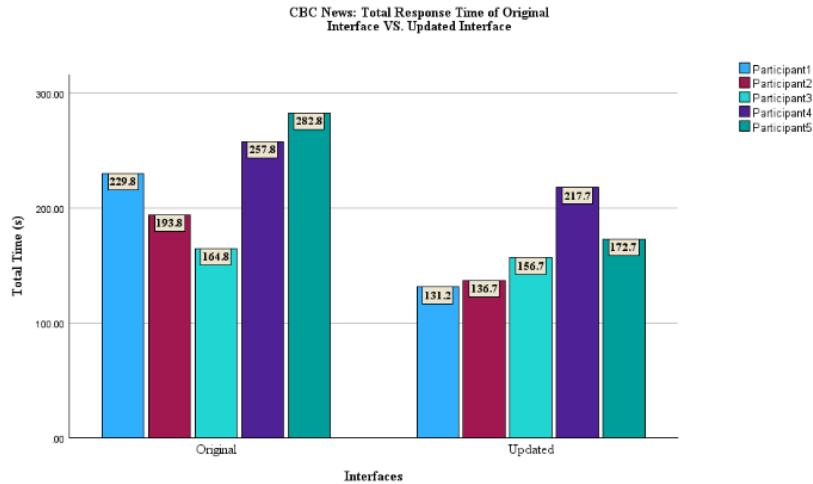


Fig. 11. Bar Chart -

Comparing the total time spent on both interfaces

It further validated that the time spent on the updated interface by all participants has improved.

Samples Statistics				
Independent variables	Size	Mean (s)	Standard Deviation	Std. Error Mean
Original	5	225.75	47.52368	21.25324
Updated	5	163.00	34.7448	15.5383

As shown in the Paired Samples Statistics derived from a sample size of 5, the mean response time for the original interface averaged 225.75 seconds, with a standard deviation of 47.52 seconds and a standard error mean of 21.25 seconds. Conversely, the updated interface demonstrated a decreased mean response time of 163.00 seconds, coupled with a standard deviation of 34.74 seconds and a standard error mean of 15.54 seconds.

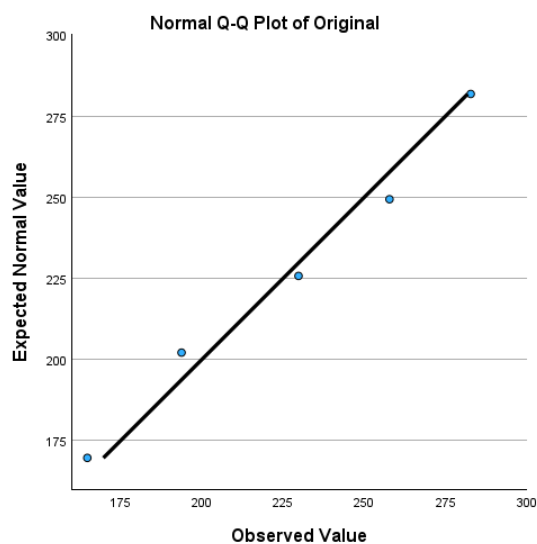


Fig. 12. Q-Q Plot for Original interface

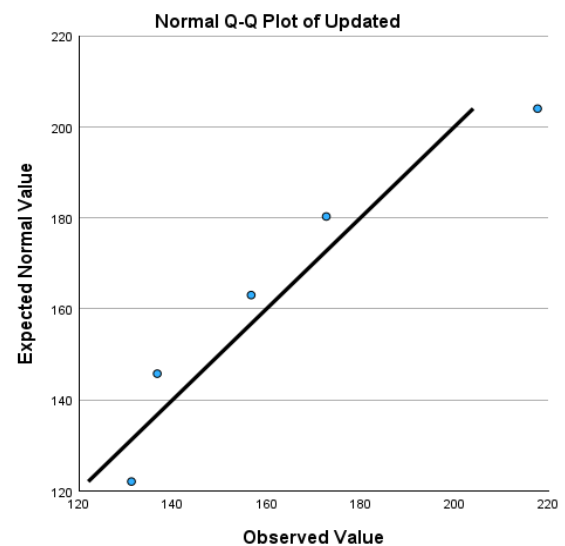


Fig. 13. Q-Q Plot for Updated interface

Q-Q plot lines for both the original and updated interfaces appear straight and closely follow the diagonal line (line of equality), it suggests that the response time data for both interfaces closely approximate a normal distribution. As a result, we are expected to see a bell-shape distribution.

Based on the feedback received, the majority of participants expressed a preference for the comment section style in the updated interface, responding positively to the changes. Specifically, 80% of the participants favoured the updated version of the comment section, noting its improved ease of accessibility.

Discussion

Transitioning the comment section of the CBC News into pop-up windows aimed to streamline user engagement and minimize cognitive workload by maintaining context and reducing cognitive switching. The impact of this interface update on user experience was evaluated through experiments that used user-centered design principles. Initial results indicate a positive reception to the pop-up window design, with users reporting reduced memory workload.

However, it's important to note that users may not be accustomed to the new design of the comment section, as conventional interfaces typically position it below articles. This unfamiliarity could initially affect users' navigation and engagement with the comment section, influencing their overall experience.

Expanding the participant pool could offer deeper insights into user perceptions and behaviours, allowing for more conclusions regarding the effectiveness of the interface update. Additionally, unforeseen factors, such as participants selecting lengthier articles, may impact the outcomes of the experiment by requiring more reading time, thereby influencing their interaction with the interface and their perception of the pop-up window design. These situational variables should be considered when interpreting the results and may warrant further investigation in further studies.

As mentioned in the feedback from participants, further updates could incorporate the option for users to select between placing the comment section below articles (a convention observed in most interfaces) or as a pop-up window. This customizable setting would afford users greater flexibility and accommodate their individual preferences more effectively.

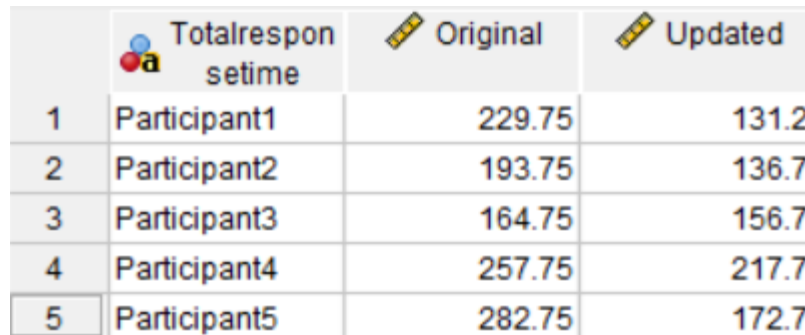
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- [3] D. D. Salvucci and P. Bogunovich, “Multitasking and monotasking,” *Proceedings of the 28th international conference on Human factors in computing systems - CHI '10*, 2010, doi: <https://doi.org/10.1145/1753326.1753340>.
- [4] M. Bauerly and Y. Liu, “Effects of Symmetry and Number of Compositional Elements on Interface and Design Aesthetics,” *International Journal of Human-Computer Interaction*, vol. 24, no. 3, pp. 275–287, Mar. 2008, doi: <https://doi.org/10.1080/10447310801920508>.
- [5] M. Soegaard, “Gestalt principles of form perception,” *The Interaction Design Foundation*, 2009. <https://www.interaction-design.org/literature/book/the-glossary-of-human-computer-interaction/gestalt-principles-of-form-perception> s

Appendix A – Raw Data

Total Response Time of Original and Updated Interface		
Total response time	Original	Updated
Participant1	229.75	131.2
Participant2	193.75	136.7
Participant3	164.75	156.7
Participant4	257.75	217.7
Participant5	282.75	172.7

Table: Excel Data Table (1): Total response Time of Original and Updated interface



	Totalrespon setime	Original	Updated
1	Participant1	229.75	131.2
2	Participant2	193.75	136.7
3	Participant3	164.75	156.7
4	Participant4	257.75	217.7
5	Participant5	282.75	172.7

Image: IBM SPSS Statistics (1): Variables and data used in SPSS

Time spent on counted subtasks for each participant					
Response Time	P1(20-50)	P2(20-50)	P3 (20-50)	P4 (60-80)	P5 (60-80)
Read comments(1)	55	40	71	66	80
Type comment(1)	50	27	25	58	64
Review comment(1)	46	20	39	44	67
Type comments reading the article(2)	97	103	111	163	126
Review comment(2)	5	3	16	21	15
*(1) indicates original interface task, (2) indicates updated interface task					
P stands for Participant (i.e., P1 = Participant 1), Age range 20-50, 60-80					

Table: Excel Data Table (2): Time spent on the counted subtasks for each participant

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Participant1	2	131.20	229.75	180.4750	69.68537
Participant2	2	136.70	193.75	165.2250	40.34044
Participant3	2	156.70	164.75	160.7250	5.69221
Participant4	2	217.70	257.75	237.7250	28.31963
Participant5	2	172.70	282.75	227.7250	77.81710
Valid N (listwise)	2				

*Table: IBM SPSS Statistics (2): Descriptive Statistics based on participants***Paired Samples Statistics**

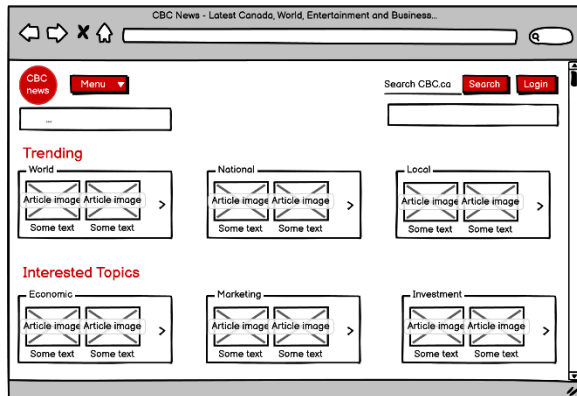
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Original	225.7500	5	47.52368	21.25324
	Updated	163.000	5	34.7448	15.5383

*Table: IBM SPSS Statistics (3): Paired Samples Statistics of original and updated interface***One-Sample Kolmogorov-Smirnov Test**

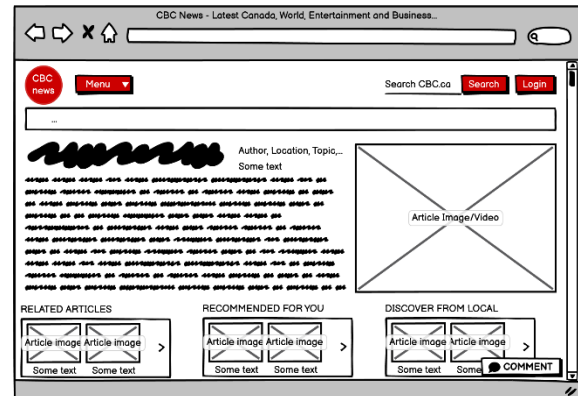
		Original	Updated
N		5	5
Normal Parameters ^{a,b}	Mean	225.7500	163.000
	Std. Deviation	47.52368	34.7448
Most Extreme Differences	Absolute	.150	.190
	Positive	.150	.190
	Negative	-.150	-.180
Test Statistic		.150	.190
Asymp. Sig. (2-tailed) ^c		.200 ^d	.200 ^d
Monte Carlo Sig. (2-tailed) ^c	Sig.	.975	.841
	95% Confidence Interval	Lower Bound	.972
		Upper Bound	.978

Table: IBM SPSS Statistics (4): One-Sample Kolmogorov-Smirnov Test

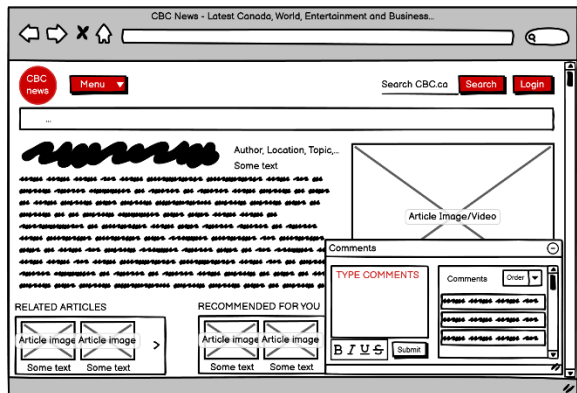
Appendix A – Wireframe



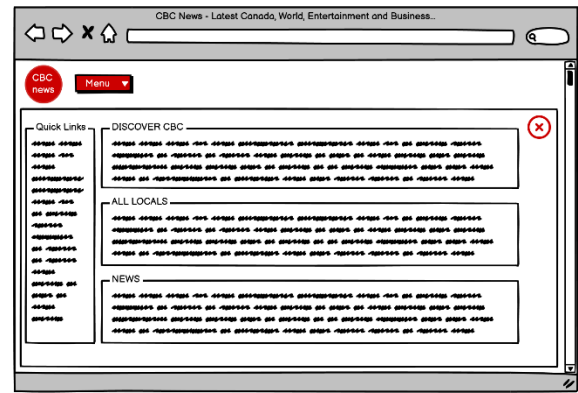
Wireframe Image (1): Main page



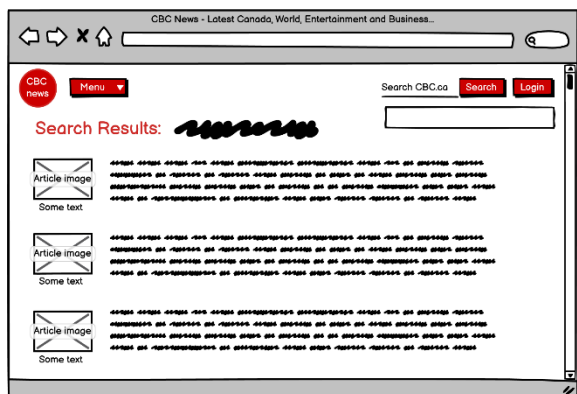
Wireframe Image (2): Article page



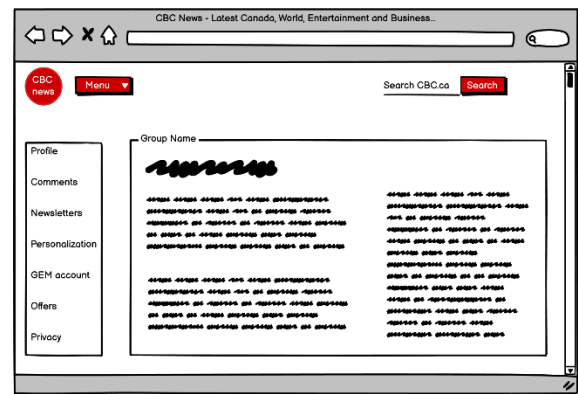
Wireframe Image (3): Pop-up window



Wireframe Image (4): Navigation Menu



Wireframe Image (5): Search



Wireframe Image (6): Login

Appendix A – Feedback

Participant 1 Questionnaire Feedback:

Timestamp, Age Group	2024-04-01 11:04:41 AM, (20-50)
1. Do you think the layout of interface improved?	Yes
2. Was it easier to leave a comment using updated interface?	Yes
3. Did you find the comment section easier to locate?	Yes
4. Which version has a better comment section?	Updated interface
5. How would you describe your experience with the overall layout of the article page?	The Overall Layout of the article was good. More organized, page looks clean
6. Is there any specific update that stood out to you?	The organized sections of topics on main page
7. Did you encounter any technical issues or errors while using CBC News?	No
8. Will you continue to use the updated version of CBC News in the future?	Yes
9. Did you prefer the original version or the updated version? Why?	Updated, easier to see both the comments and the article
10. Any suggestions for the updated version of CBC News?	no

Participant 2 Questionnaire Feedback:

Timestamp, Age Group	2024-04-01 12:07:22 PM, (20-50)
1. Do you think the layout of interface improved?	Yes
2. Was it easier to leave a comment using updated interface?	No
3. Did you find the comment section easier to locate?	No
4. Which version has a better comment section?	Updated interface
5. How would you describe your experience with the overall layout of the article page?	Good layout, less contents and words show on the page. Easy to navigate.
6. Is there any specific update that stood out to you?	No
7. Did you encounter any technical issues or errors while using CBC News?	I was trying to scroll down to find the comment section.
8. Will you continue to use the updated version of CBC News in the future?	Yes
9. Did you prefer the original version or the updated version? Why?	Both, more used to original comment section style, but the updated is cleaner.
10. Any suggestions for the updated version of CBC News?	possible to have both styles of comment section.

Participant 3 Questionnaire Feedback:

Timestamp, Age Group	2024-04-01 3:22:18 PM, (60-80)
1. Do you think the layout of interface improved?	No
2. Was it easier to leave a comment using updated interface?	Yes
3. Did you find the comment section easier to locate?	Yes
4. Which version has a better comment section?	Updated interface
5. How would you describe your experience with the overall layout of the article page?	Articles are not having enough overview
6. Is there any specific update that stood out to you?	Comment section
7. Did you encounter any technical issues or errors while using CBC News?	No
8. Will you continue to use the updated version of CBC News in the future?	Yes
9. Did you prefer the original version or the updated version? Why?	Updated, comment section looks new and cool.
10. Any suggestions for the updated version of CBC News?	No

Participant 4 Questionnaire Feedback:

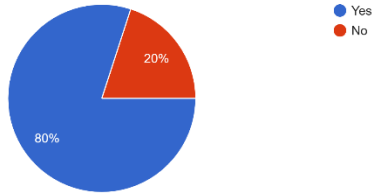
Timestamp, Age Group	2024-04-01 7:10:36 PM, (20-50)
1. Do you think the layout of interface improved?	Yes
2. Was it easier to leave a comment using updated interface?	Yes
3. Did you find the comment section easier to locate?	Yes
4. Which version has a better comment section?	Updated interface
5. How would you describe your experience with the overall layout of the article page?	Good in general, simple to use as always
6. Is there any specific update that stood out to you?	The layout of the pages, clean and neat
7. Did you encounter any technical issues or errors while using CBC News?	No
8. Will you continue to use the updated version of CBC News in the future?	Yes
9. Did you prefer the original version or the updated version? Why?	Updated, it looks very nice where things are organized to sections, the article image, content and information look more organized too
10. Any suggestions for the updated version of CBC News?	No, all looks good to me :)

Participant 5 Questionnaire Feedback:

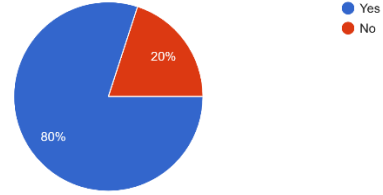
Timestamp, Age Group	2024-04-03 11:14:23 AM, (60-80)
1. Do you think the layout of interface improved?	Yes
2. Was it easier to leave a comment using updated interface?	Yes
3. Did you find the comment section easier to locate?	Yes
4. Which version has a better comment section?	Updated interface
5. How would you describe your experience with the overall layout of the article page?	There were less contents showing, faster for me to locate things
6. Is there any specific update that stood out to you?	I like the way the sections are lined up on the main page
7. Did you encounter any technical issues or errors while using CBC News?	No
8. Will you continue to use the updated version of CBC News in the future?	Yes
9. Did you prefer the original version or the updated version? Why?	I preferred the updated version because it has a more convenience comment section, I found it easier to locate and to use.
10. Any suggestions for the updated version of CBC News?	I like the layout! Maybe have the overview being zoomed (show more content when mouse is on the region) could help!

Questionnaire Data Summary (Graphs)

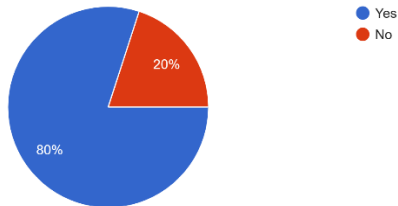
1. Do you think the layout of interface improved?
5 responses



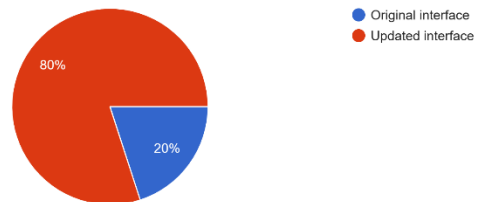
2. Was it easier to leave a comment using updated interface?
5 responses



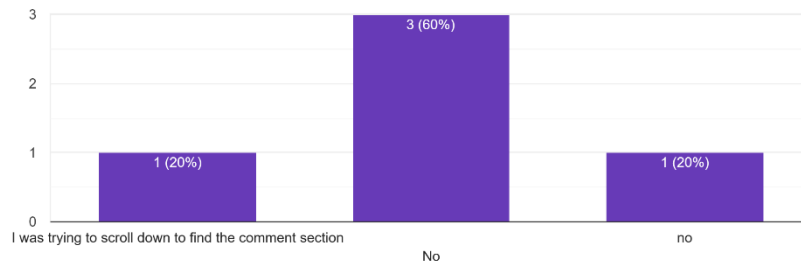
3. Did you find the comment section easier to locate?
5 responses



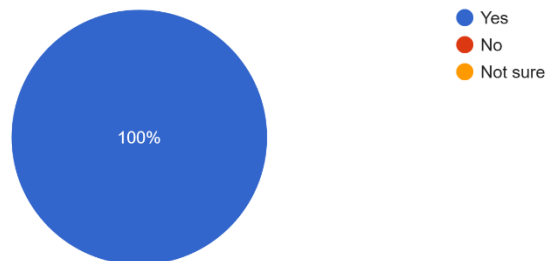
4. Which version has a better comment section?
5 responses



7. Did you encounter any technical issues or errors while using CBC News?
5 responses



8. Will you continue to use the updated version of CBC News in the future?
5 responses



Appendix B

General Informed Consent Template for Participants

Study Title: Enhancing User Experience through Interface Update

Name and Contact Information of Researchers:

Name: Tina L Cao, Carleton University, Faculty of Computer Science

Tel: 613-520-3500

Email: tinacao@cmail.carleton.ca

Project Sponsor and Funder: Dr. Moacdieh

Invitation

You are invited to take part in a research project because you are an experienced user of CBC News from age 20-80. The information in this form is intended to help you understand what we are asking of you so that you can decide whether you agree to participate in this study. Your participation in this study is voluntary, and a decision not to participate will not be used against you in any way. As you read this form, and decide whether to participate, please ask all the questions you might have, take whatever time you need, and consult with others as you wish.

What is the purpose of the study?

The study focuses on evaluating the efficiency and user experience of an updated version of CBC News, primarily centered around the introduction of a pop-up window for the comment section and minor layout changes to the interface.

What will I be asked to do?

If you agree to take part in the study, we will ask you to:

- Participate in an individual video call with researcher online, via Zoom platform
- Interact with two interfaces, CBC News and updated CBC News on Wireframe
- Find a quiet, stable internet space
- The activity is approx. 15 minutes
- Complete a questionnaire

Risks and Inconveniences

Privacy Risks: Sharing personal information during feedback sessions may pose a privacy risk, although we will take all necessary precautions to protect your data.

Mild Discomfort: You may experience mild discomfort or inconvenience while navigating the updated interface or providing feedback on the pop-up comment section.

Possible benefits

You may not receive any direct benefit from your participation in this study. However, your participation may allow researchers to better understand user preferences and interactions with the updated version of CBC News. Your contribution to this study is highly valuable and greatly appreciated.

Compensation/Incentives

You will not be paid or compensated for your participation in this study.

No waiver of your rights

By signing this form, you are not waiving any rights or releasing the researchers from any liability.

Withdrawing from the study

If you withdraw your consent during the course of the study, all information collected from you before your withdrawal will be discarded, unless you request that it be removed from the study data.

After the study, you may request that your data be removed from the study and deleted by notice given to Tina L Cao within 15 days.

Confidentiality

We will remove all identifying information from the study data as soon as possible, which will be after the completion of data collection and analysis. This ensures your anonymity and confidentiality throughout the research process. Rest assured that your privacy is our utmost priority.

We will treat your personal information as confidential, although absolute privacy cannot be guaranteed. No information that discloses your identity will be released or published without your specific consent. Research records may be accessed by the Carleton University Research Ethics Board B, in order to ensure continuing ethics compliance.

All data will be kept confidential, unless release is required by law (e.g., child abuse, harm to self or others). The results of this study may be published or presented at an academic conference or meeting, but the data will be presented so that it will not be possible to identify any participants unless you give your express consent.

"In-session" data, such as the audio, video, and chat transcript from the interview, will be stored locally on the researcher's computer.

Your participation is appreciated, and your privacy is our utmost concern. If you have any concerns about the handling of your data, please do not hesitate to contact us.

Data Retention

Your de-identified data will be retained for a period of 15 days and then securely destroyed.

New information during the study

In the event that any changes could affect your decision to continue participating in this study, you will be promptly informed.

Ethics review

This project was reviewed and cleared by the Carleton University Research Ethics Board B. If you have any ethical concerns with the study, please contact Carleton University Research Ethics Board, preferably by email at ethics@carleton.ca or you can leave a message by phone at 613-520-2600 ext. 2517.

Statement of consent – print and sign name

I voluntarily agree to participate in this study.

___Yes ___No

Optional I agree to be (audio recorded)

___Yes ___No

Signature of Participant (or parent/guardian)

Date

Research team member who interacted with the participant

I have explained the study to the participant and answered any and all of their questions. The participant appeared to understand and agree. I provided a copy of the consent form to the participant for their reference.

Signature of researcher

Date