

Human Computer Interaction

Low-fi prototype design and Cognitive Load Effects

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1. Introduction

CovidNow is a web app that automatically provides personalised and accessible COVID-19 related information based on users' details stored in their accounts. Users will be notified of critical up-to-the-minute updates tailored to their accounts along with a visual representation of COVID-19 new cases, clusters, testing and vaccine centres based on users' location.

As a result, the main purpose of the web app is to provide COVID-19 information personalised to users' details. This helps users to save time and effort searching on the internet and other websites to look for relevant information that applies to them.

The web app can potentially attract a broad range of users, including workers/essential workers, students and business owners as primary users, health professionals and support staff as secondary and tertiary users, respectively.

2. Analysis

In this section, we analyse the design of some of the prototype's pages that are based on cognitive load effects.

- Expertise reversal effect

According to Sweller et al. (2003, p. 23-31), when users face new information, they initially process the information in their working memory. Learning the information helps them store the schema of the latest news in their long-term memory and reduce the load on working memory. However, as Sweller et al. (2003, p. 23-31) reported, this method is not always productive and highly depends on how users are experienced at using the product. They believe that although presenting instructions and new information for novice users can be effective, it can negatively impact when expert users try to use the product. This is called as expertise reversal effect.

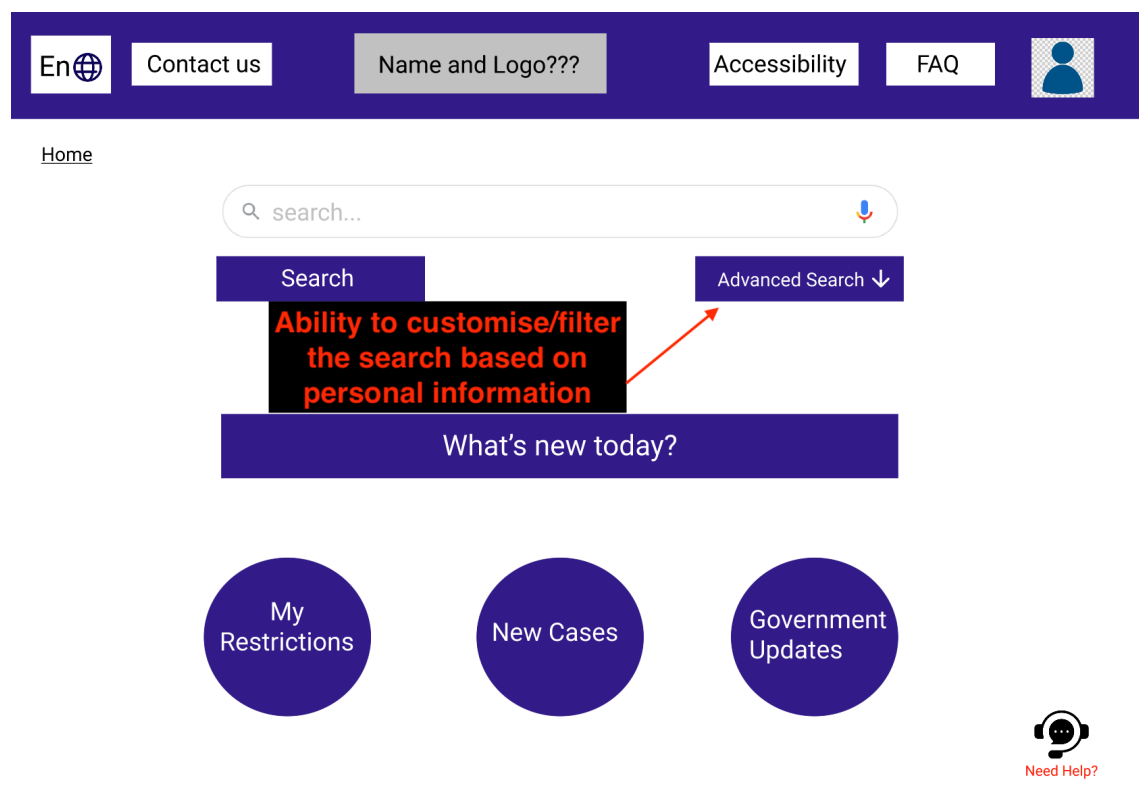


Figure 1

The design above demonstrates the main page of the web application. As we can see, users are able to customise their search for updates based on their personal information by using the advanced search button where they can manually input their personal data and then search. However, this can be ineffective and annoying if experienced users manually input their details every time they like to search. As a result, upon signing up to create an account for the app, users can input their details only once. After that, all the information and search results displaying on the map will be adjusted to users' preferences.

Home > Sign Up > Step 2 of 3

Step 2 of 3: Enter your personal details (optional)

Date of birth

Home address

Work address

Educational institution address

NEXT ->

Users can enter their personal information for optimal result and experience with the web app

Need Help?

Figure 2

- Redundancy effect

The redundancy effect makes the learning process more difficult when an extra amount of information is provided to users while displaying less information can result in more effective learning (Jin P., 2012).

The design below demonstrates one of the pages in the app called 'My restrictions', where users can see the latest restrictions applied by the government. Users also have the ability to filter these restrictions based on their data.

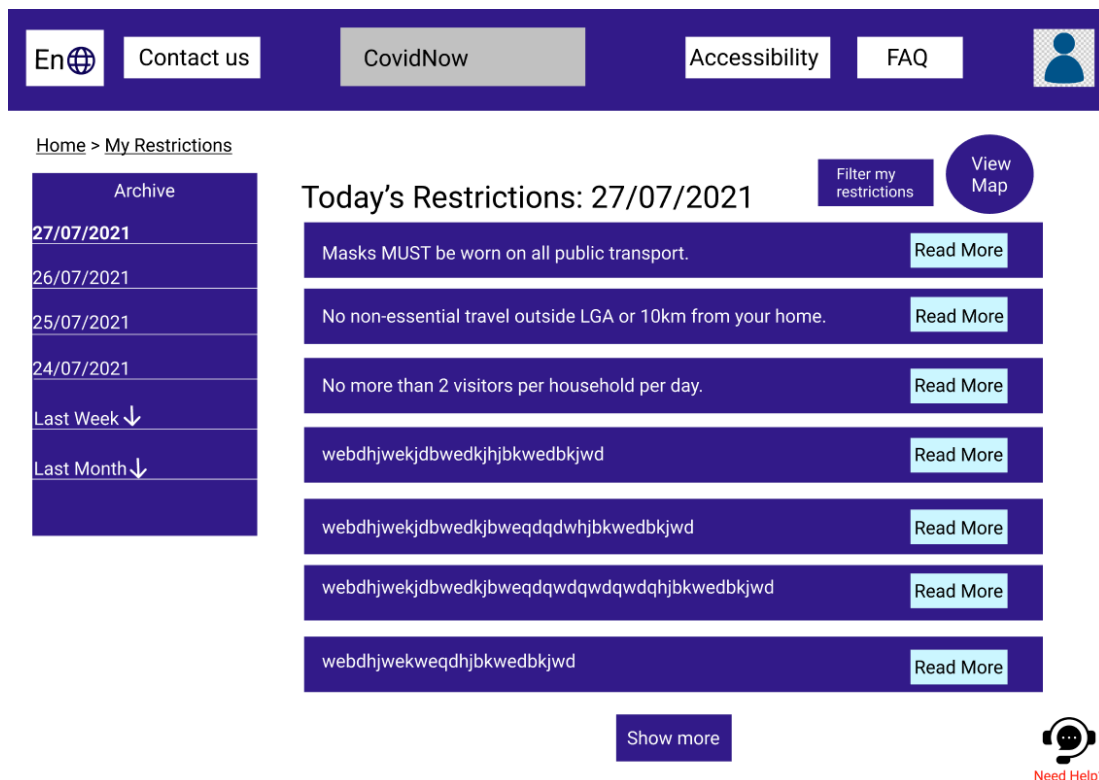


Figure 3

As we can see, the mentioned page is crowded and bombarded with lots of buttons, links and information which may appear redundant. This can increase users' working memory load, and they may experience difficulty learning and understanding the page design. As a result, a more succinct and summarised presentation of information is preferred for the layout of this page.

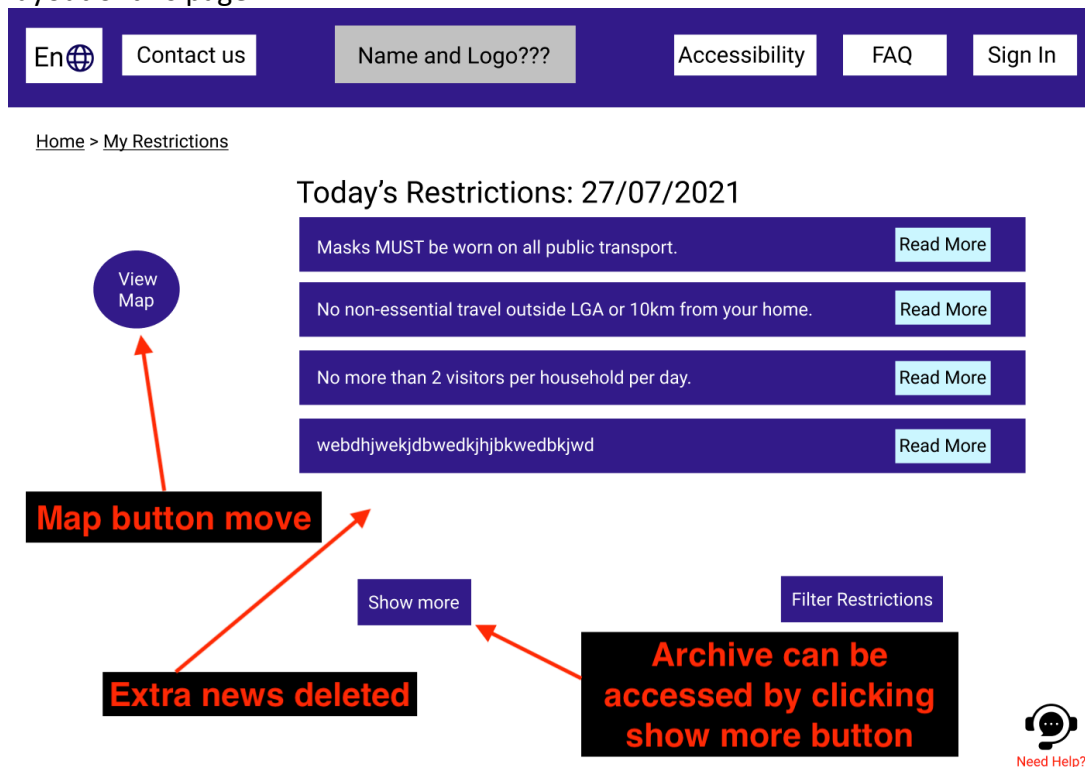


Figure 4

As displayed above, the changes have been applied to simplify the layout and make it look less cluttered.

The archive links and dropdowns are removed as they do not seem to be essential. Also, the number of restrictions shown on the page is lowered to avoid overwhelming users with loads of new information and data.

Therefore, the page's design looks more straightforward to learn, involving less working memory than it was before.

- Worked example effect

According to Ayres P. (2012), worked example effect refers to the situations where solutions to a particular problem are provided. Users can learn from these worked examples in order to solve a similar or the same problem demonstrated in the worked example. This effect helps users learn faster and more efficiently as they do not need to figure out the solutions themselves.

The current design of the prototype does not provide any additional presentation to help users learn the interface more efficiently with a worked example. As a result, a short video of how to use the web app and its different features and a step-by-step explanation on how to achieve the goals can help the users increase the system's learnability.

Therefore, the worked example video will be added to the FAQ page of the web app where users refer to look for answers to their questions.

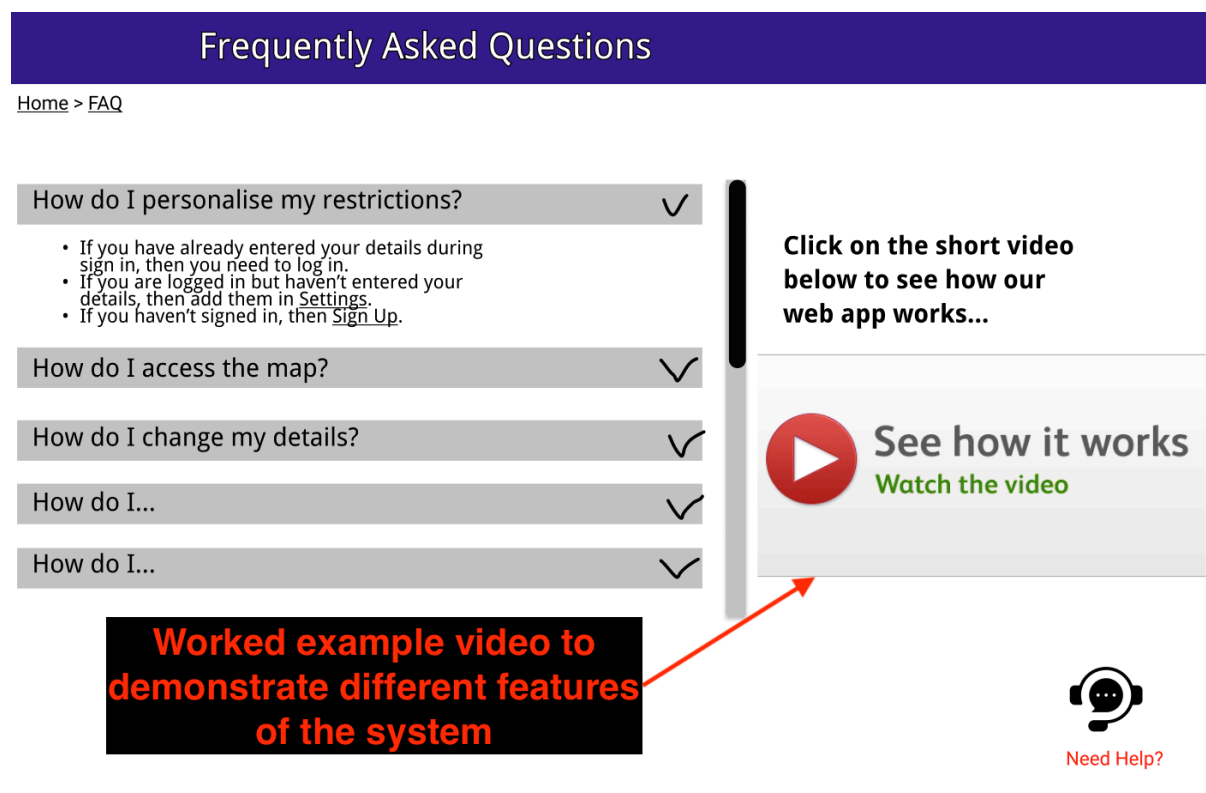


Figure 5

References

- Ayres P. (2012) Worked Example Effect. In: Seel N.M. (eds) Encyclopedia of the Sciences of Learning. Springer, Boston, MA. https://doi.org/10.1007/978-1-4419-1428-6_20
- Jin P. (2012) Redundancy Effect. In: Seel N.M. (eds) Encyclopedia of the Sciences of Learning. Springer, Boston, MA. https://doi.org/10.1007/978-1-4419-1428-6_200
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