NZQA

Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Level 1 Digital Technologies RAS 2023

92006 Demonstrate understanding of usability in human-computer interfaces

EXEMPLAR

Merit   TOTAL **06**

Instructions

The task in this assessment is in four parts:

● In part (a), you will refer to an interface you have studied at school ("your interface").
● In part (b) you will refer to the video, which shows a user interacting with a website.
● In part (c) you will compare the usability of the interfaces.
● In part (d) you will make recommendations on how to improve the usability of both interfaces.

You are required to discuss the usability of the interfaces in terms of mātāpono Māori (Resource A) or the usability heuristics (Resource B) on .

You may include up to five screenshots from each interface to illustrate your answers. Do not use more than 10 in total.

Read all parts of the task before you watch the video. You may play, pause, and restart the video as often as you like. *Note: the video has no sound.*

Resource A: Mātāpono Māori

• the accurate and clear use of te reo Māori (including macrons) within the interface

• whether tools such as spell-checking and word prediction work accurately with te reo Māori

• how the interface facilitates and allows for the expression and use of tikanga and mātauranga Māori.

Resource B: Nielsen's 10 Usability Heuristics

"Usability heuristics" are general principles or "rules of thumb" to help measure the effectiveness of a user interface. You will be familiar with Jakob Nielsen's 10 usability heuristics listed below.

1. Visibility of the system's status

2. Match between the system and the real world

3. User control and freedom

4. Consistency and standards

5. Error prevention

6. Recognition rather than recall

7. Flexibility and efficiency of use

8. Aesthetic and minimalist design

9. Help users recognise, diagnose, and recover from errors

10. Help and documentation

Source (adapted): Nielsen, J. (1994, April 14, updated 2020, November 15). *10 usability heuristics for user interface design*. Nielsen Norman Group. https://www.nngroup.com/articles/ten-usability-heuristics/

Assessment Task

Maia is studying usability in human-computer interfaces and has asked you to help her learn key concepts by discussing an interface that you have studied at school and one that she has used recently.

An interface that you have studied at school

(a) (i) State the name of your interface.

> Bunnings

(ii) Briefly describe the purpose of your interface. What does the user want to achieve while they are using it?

> Bunnings is a store that sells items (mostly hardware) and has a website which can be used so that users can buy or find items without having to go to the store by getting them delivered instead.

An interface that Maia has used recently

Maia recently shopped online on the *Little Shop of Taonga* website for her brother's 18th birthday gift.

You have been provided a video of Maia interacting with the website.

In the video, Maia:

- reads the "About Us" page and subscribes to the newsletter
- creates an account and adds her address
- browses categories and adds items to the cart
- searches the FAQs for the returns policy and uses the chat feature to find out shipping times
- decides on a gift, removes an item she doesn't want from the cart, and checks out
- uses the contact form for an enquiry about commissioning a unique piece for her parents' anniversary

Video timings

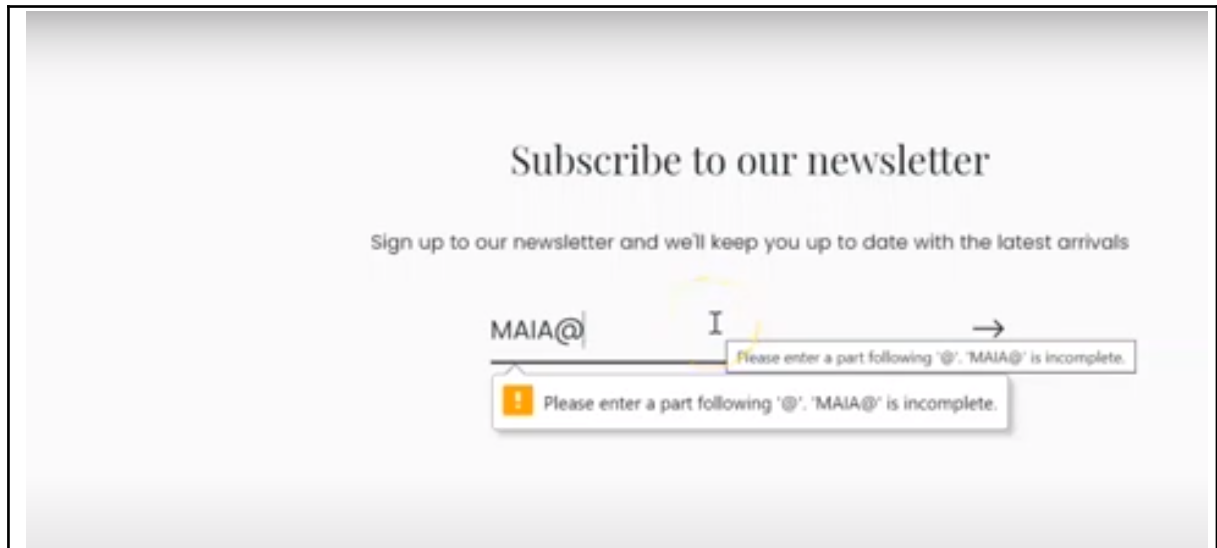| Activity	Timestamp
(1) Reads "About Us" page and subscribes to the newsletter	00.06
(2) Creates an account and adds her address	01.30
(3) Browses categories and adds items to the cart	03.40
(4) Searches the FAQs and uses the chat feature	04.58
(5) Checks out	06.42
(6) Uses the contact form for an enquiry	07.28

(b) Choose THREE of the activities from the list on .

(i) For each activity, explain how mātāpono Māori OR usability heuristics are used.
If you discuss usability heuristics, provide a description of each.

You may support your answer with screenshots from the video.

| Activity:Reads "About Us" page and subscribes to the newsletter |
| --- |

Response:

When an incorrect email (didnt have @) was added the website gave a error message when the arrow was clicked and didn't let them progress any further. This prevented the users error of entering an invalid email which could cause problems later. This shows the usability heuristic, error prevention(where ever possible the interface must prevent errors from occuring in the first place, either by removing error prone conditions or by providing the user with a confirmation) and the error message clearly identifies the error (not having not being complete and showing that there should be more parts to the email after) and asking the user to enter the rest of the email. This shows the heuristic, help users recognise, diagnose and recover from errors (good error messages are useful and should clearly identify the error and suggest a solution, they should be written in plain language and should not contain error codes). These 2 helped the user fix their email. The problem though was that in the end the user was allowed to continue even though they were missing a 'm' in .com which makes that email invalid. This could cause problems later so this feature only prevents some problems making it a bit ineffective.

The arrow through shows the heuristic match between the system and the real world (the interface should speak in the users language using words, phrases and actions familiar to the user and making information appear in a natural and logical order) because the arrow is associated with moving on (this is used in road signs etc) it gives the user the idea of clicking it to continue. This helps the user understand the interface better and the arrow is also used in many webpages for similar uses so this shows the heuristic, consistency and standards (users should not have to wonder if different words, phrases or actions mean the same thing, follow platform conventions) which further helps users identify its purpose. This saves time and makes the website less confusing to use.

Activity: Browses categories and adds items to the cart
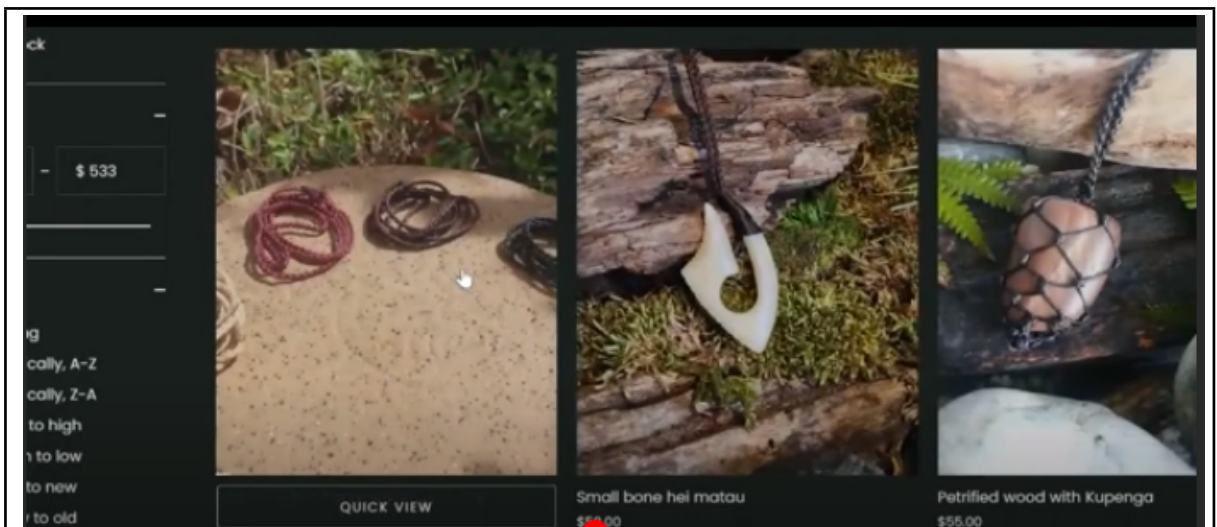
Response:

The interface shows the heuristic aesthetic and minimalist design by having only relevant information in the website and the most important ones (items and their prices) taking up most of the interface with options to sort the items out at the side which all helps the user find the items they want to buy which saves time. The website also shows the heuristic error prevention by making the user have to click multiple times to add more items to buy. This prevents the "off by one error" which could cause the user to accidentally add too many items (if the user had to type in how many items they want they could accidentally add an extra 0 etc) which could cause the user to have to pay much more than they need to. The interface also shows a pop up to show the user that they added that item into the cart which could be important if the user accidentally added an item which prevents errors like that from happening.
 The website also shows the heuristic, match between the system and the real world (the interface should speak in the users language using words, phrases and actions familiar to the user and making information appear in a natural and logical order) by using symbols such as a trolley which is used to keep items that are about to be bought in and using a magnifying glass which is used to search for things which are all items familiar to the user which helps them identify them easily(this also helps them find the options because most of the time, users will "scan" the webpage rather that reading it so it is easier to "scan" for images that it is for letters).

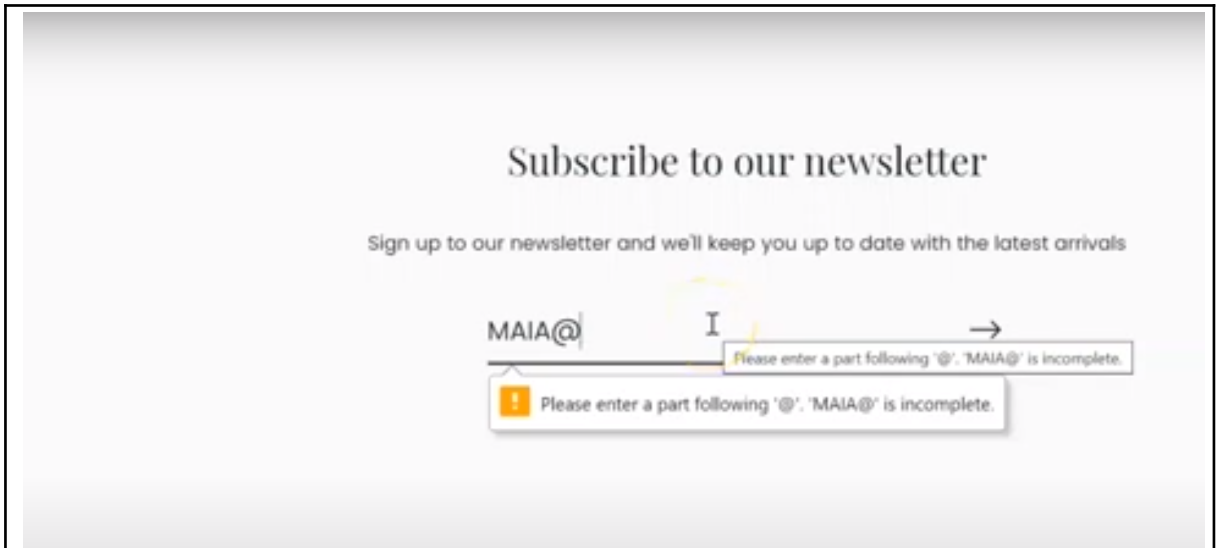| Activity: Creates an account and adds her address |
|---|

Response:

When the user enters a invalid email and password, the interface didn't let them continue any further and a error message showed that the email and password are incorrect and told the user that the password should have a minimum of 5 characters. The interface only contains necessary information and the information appear in an order used by a lot of different websites for the same purpose. This shows the heuristic aesthetic and minimalist design (the interface should not contain information that is irrelevant or rarely needed because every extra bit of information competes with and diminishes the relative visibility of the necessary information) by only containing necessary information which makes it easier to use because the user can quickly find what they need without any distractions. This shows the heuristic error prevention when it prevents the user from going any further when they enter an invalid email and password because this could cause problems later and the heuristic help users recognise, diagnose and recover from errors by showing that they need a password with more that 5 characters and that their email is invalid. This could be improved though if the error suggests a way to fix the issue with the email aswell rather that just saying email is invalid. This also shows the heuristic consistency and standards(users should not have to wonder if different words, phrases or actions mean the same thing, follow platform conventions) where it uses an interface with information in a order used by many websites which makes it easier to use and less confusing because most users would've already done this many times. The problem is that when an invalid input is entered it resets the entire thing making the user have to remember what they needed to type in again which is time consuming and against the heuristic recognition rather that recall (reduce the users memory load by making actions and information visible) because otherwise the information would be visible to the user and they won't have to remember it all.

(ii)   Evaluate how successfully mātāpono Māori OR usability heuristics have been applied in each activity.

You may support your answer with screenshots from the video.

Activity: Reads "About Us" page and subscribes to the newsletter

Response:

When an incorrect email (didnt have @) was added the website gave a error message when the arrow was clicked and didn't let them progress any further. This prevented the users error of entering an invalid email which could cause problems later. This shows the usability heuristic, error prevention(where ever possible the interface must prevent errors from occuring in the first place, either by removing error prone conditions or by providing the user with a confirmation) and the error message clearly identifies the error (not having not being complete and showing that there should be more parts to the email after) and asking the user to enter the rest of the email. This shows the heuristic, help users recognise, diagnose and recover from errors (good error messages are useful and should clearly identify the error and suggest a solution, they should be written in plain language and should not contain error codes). These 2 helped the user fix their email. The problem though was that in the end the user was allowed to continue even though they were missing a 'm' in .com which makes that email invalid. This could cause problems later so this feature only prevents some problems making it a bit ineffective in terms of error prevention but is good for help users recognise diagnose and recover from errors(this could also be improved by adding some options such as '@gmail.com' etc which would show the heuristic recognition rather that recall (minimise the users memory load by making options, actions and information visible, users should not have to remember parts of one page to another) which saves time and helps the user remember what to add in which in turn helps them recover from the error (help users recognise, diagnose and recover from errors). This interface is alright but could definitely be improved.

Activity: Browses categories and adds items to the cart
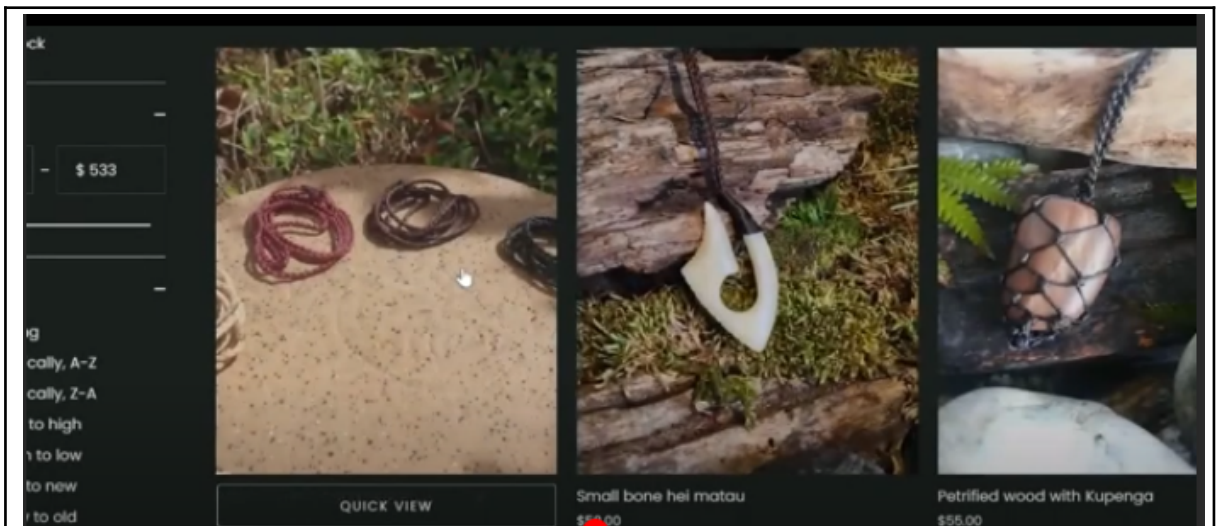
Response:

The interface shows the heuristic aesthetic and minimalist design by having only relevant information in the website and the most important ones (items and their prices) taking up most of the interface with options to sort the items out at the side which all helps the user find the items they want to buy which saves time. The website also shows the heuristic error prevention by making the user have to click multiple times to add more items to buy. This prevents the "off by one error" which could cause the user to accidentally add too many items (if the user had to type in how many items they want they could accidentally add a extra 0 etc) which could cause the user to have to pay much more that they need to. The interface also shows a pop up to show the user that they added that item into the cart which could be important if the user accidentally added an item which prevents errors like that from happening.

The website also shows the heuristic, match between the system and the real world (the interface should speak in the users language using words, phrases and actions familiar to the user and making information appear in a natural and logical order) by using symbols such as a trolley which is used to keep items that are about to be bought in and using a magnifying glass which is used to search for things which are all items familiar to the user which helps them identify them easily(this also helps them find the options because most of the time, users will "scan" the webpage rather that reading it so it is easier to "scan" for images that it is for letters).

This interface is an excellent example showing aesthetic and minimalist design with barely any distractions or unnecessary information. This makes it easy for the users to find what they want and saves a lot of time.

The website also does well in terms of error prevention by making actions that could have consequences hard to do (having to click once for each item preventing off by one errors) and showing an alert when they add items. This prevents small "slips" and mistakes from causing problems later. It also shows an image of what the user is buying alongside its name which shows the heuristic recognition rather that recall which helps the user remember what they just added to the cart which helps them make decisions.

It also shows the heuristic match between the system and the real world by using symbols related to items used in similar use cases that exist in the real world and making the user do actions in a similar order to what they would do if they were is a physical store. This helps users complete their task and find things.

Overall this part of the website is very effective in terms of usability.

Activity:Creates an account and adds her address

Response:

Create Account

Password is too short (minimum is 5 characters)
Email is invalid.
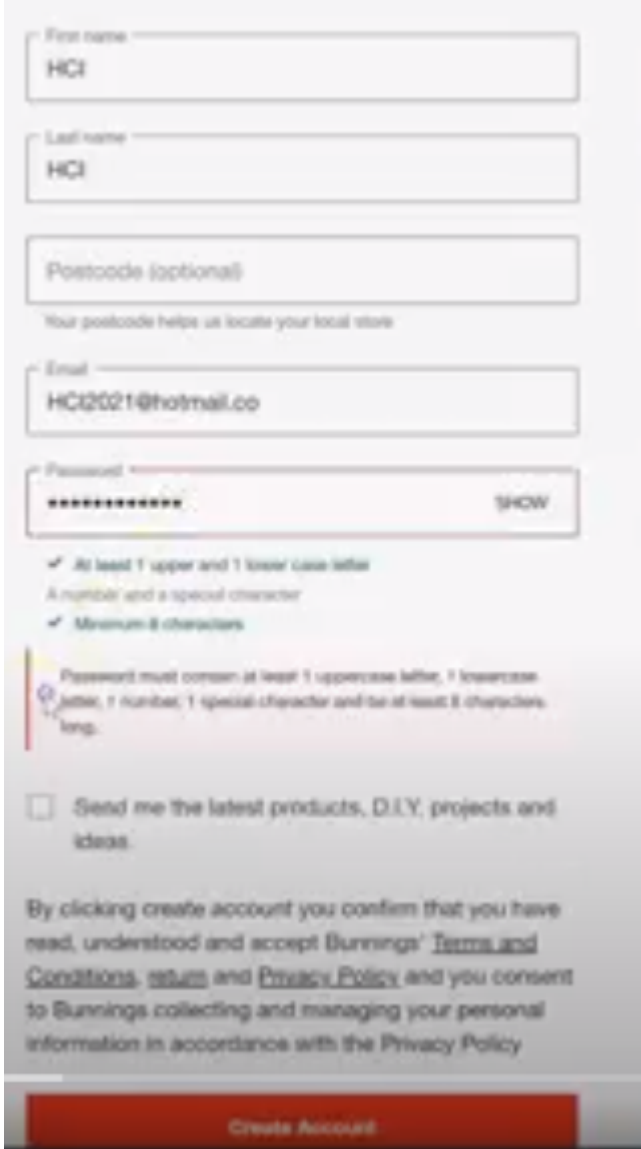
First Name

Last Name

Email

Password

When the user enters a invalid email and password, the interface didn't let them continue any further and a error message showed that the email and password are incorrect and told the user that the password should have a minimum of 5 characters. The interface only contains necessary information and the information appear in an order used by a lot of different websites for the same purpose. This shows the heuristic aesthetic and minimalist design (the interface should not contain information that is irrelevant or rarely needed because every extra bit of information competes with and diminishes the relative visibility of the necessary information) by only containing necessary information which makes it easier to use because the user can quickly find what they need without any distractions. This shows the heuristic error prevention when it prevents the user from going any further when they enter an invalid email and password because this could cause problems later and the heuristic help users recognise, diagnose and recover from errors by showing that they need a password with more that 5 characters and that their email is invalid. This could be improved though if the error suggests a way to fix the issue with the email as well rather that just saying email is invalid. This also shows the heuristic consistency and standards(users should not have to wonder if different words, phrases or actions mean the same thing, follow platform conventions) where it uses an interface with information in a order used by many websites which makes it easier to use and less confusing because most users would've already done this many times. The problem is that when an invalid input is entered it resets the entire thing making the user have to remember what they needed to type in again which is time consuming and against the heuristic recognition rather that recall (reduce the users memory load by making actions and information visible) because otherwise the information would be visible to the user and they won't have to remember it all.

Due to this, this part of the website shows error prevention, consistency and standards and aesthetic and minimalist design very well but doesn't do as well in help users recognise, diagnose and recover from errors and recognition rather than recall which makes it usable but time consuming and frustrating.

Comparison

(c)   Compare the *Little Shop of Taonga* interface with your interface. Discuss the similarities **and** differences between the interfaces, and identify which addresses mātāpono Māori OR usability heuristics best, and why.

Use screenshots to support your answer.

When setting up a account, the bunnings website shows the user the requirements for the password and a green 'tick' mark appears next to the requirements when they are fulfilled which shows recognition rather than recall because the user doesn't need to remember what the password requirements are and error prevention by showing what the user needs to do and showing them what is missing before they click 'create account' and even if they do click create account, they won't be allowed to continue before all the conditions are met. Little shop of Taonga doesn't show error prevention as well because it let the user continue with some parts of the email missing and enter incorrect information for the post number etc which can cause problems later and it also only tells the user what to do after they try to continue which is time consuming. The bunnings website also did better by using match between the system and the real world by using green tick marks and the colour green and tick mark are associated with correct while Little shop of Taonga didn't have this. Little shop of Taonga did however do slightly better in terms of aesthetic and minimalist design throughout the website because the bunnings interface looks a bit more cluttered(there is some rarely used information but still most of the information is relevant) while Little shop of Taonga only had relevant information with lots of empty space in between. Both did well by using symbols familiar to the user(trolley, magnifying glass,arrow etc) and the red colour

used for errors which signifies danger and making information appear in a natural and logical order by making the user have to follow steps that are similar to what the user would do to buy items in a real shop which shows match between the system and the real world. Both interfaces did alright in terms of help users recognise, diagnose and recover from errors by having error messages that identify the error, and suggest a solution but they were quite vague but Little shop of Taonga did a bit better by telling the user all the things that were wrong (Little shop of Taonga shows that both the email and password are wrong while if the same is done in bunnings, only one error will come up at a time which makes it time consuming and frustrating) and the error message for bunnings shows all the possible problems in the password (the problems that are actually there are shown by the list of requirements being greyed out which does help with this) while Little shop of Taonga showed exactly what was wrong. When buying items, both interfaces showed error prevention by making the user click one every time they need to add an item into the cart which prevents off by one errors by deliberately making actions which could have consequences harder to

do.

Both websites let the user remove or add items into the cart and escape from unwanted situations by adding undo options which shows the heuristic user control and freedom(users often select actions by mistake and will need a clearly marked emergency exit to leave an unwanted situation without having to go through extensive dialogue, support undo and redo) which lets the user do things without having to worry about consequences.

When checking out, little shop of taonga only shows one of the errors in the information entered (when post number and city were both wrong only one was shown) these errors though were caused by the ineffectiveness of the error prevention (it doesnt show error prevention well) but the user was able to change this and add valid information later which shows the heuristic user control and freedom which solved the issue caused.
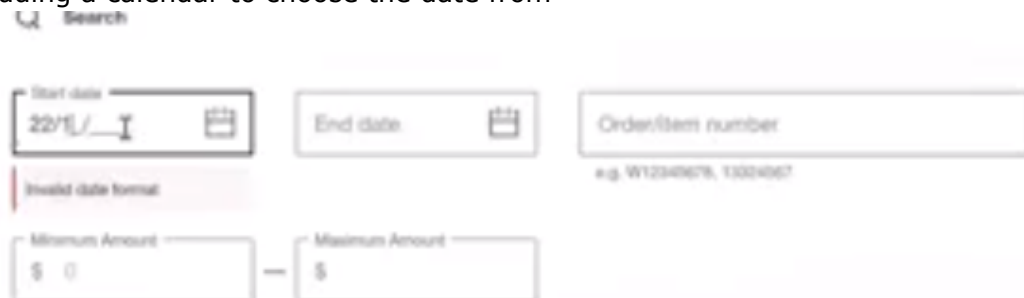
Overall, bunnings does much better in error prevention but little shop of taonga did better in aesthetic and minimalist design and help users recognise, diagnose and recover from errors. Both of them did equally in user control and freedom and match between the system and the real world. I think bunnings did a bit better overall as they followed the usability heuristics better(even though little shop taonga did better in more heuristics, it was by a small amount while bunnings did much better in terms of error prevention).

Recommendations

(d) (i) Recommend improvements that could be made to **your interface** by applying mātāpono Māori OR usability heuristics. Explain how these will improve the usability of the website in terms of the user's experience.

You may support your answer with screenshots.

When choosing a date the user can type in the date which could cause issues as the user can select anything and could enter something invalid. This could be improved by adding a calendar to choose the date from


The interface could also be improved by making the error messages (incorrect password etc) more specific and showing exactly what went wrong and showing all the mistakes rather than just one (if both email and password are wrong). This would make it less time consuming and prevent it from being frustrating by helping the user diagnose the error (help users recognise, diagnose and recover from errors).
The website could also use a progress bar to let the user know how many more steps are left until they buy the items with the actions clearly marked which can help them make decisions by estimating how long it would take (this could be useful if they want to know if they can do the task within a limited timeframe for example if they are in a hurry) which would show visibility of system status(the interface should always keep users informed about what is going on using appropriate feedback within a reasonable amount of time).
The website could also improve the interface by adding more white space and removing some of the less relevant information by moving the further down to help users find what they want and make it less cluttered because there are less distractions (aesthetic and minimalist design)
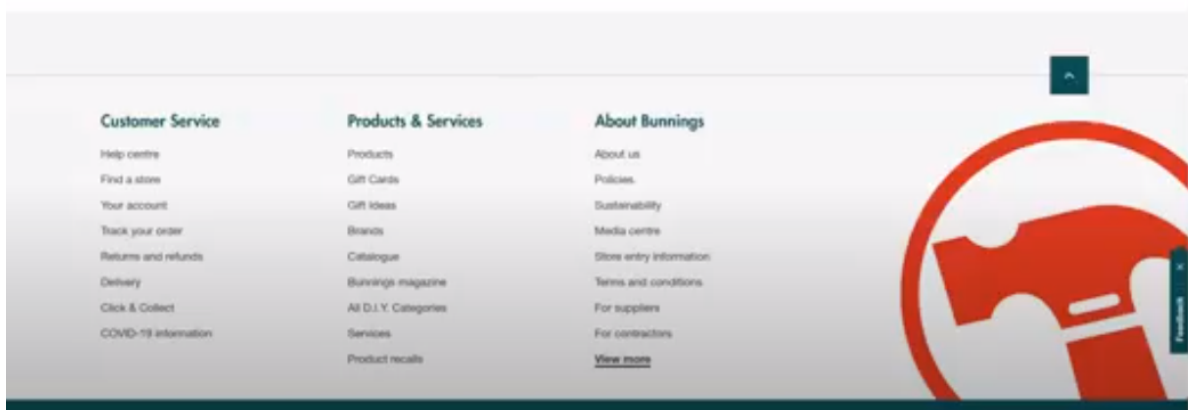
The help option is at the bottom of the page and in small letters amongst a lot of other mostly irrelevant information which makes it hard to find and this can cause problems if the user is stuck and needs help. It could be improved by moving it to the top of the page which would show the heuristic aesthetic and minimalist design which would save time and help users fix problems they may have while doing their task.

(ii) Recommend improvements that could be made to the *Little Shop of Taonga* interface by applying mātāpono Māori OR usability heuristics. Explain how these will improve the usability of the website in terms of the user's experience.

You may support your answer with screenshots.

This website could make the error messages more specific (telling the user what went wrong for example when the wrong email is entered it just said 'invalid email') and giving better instructions to fix the error (for example telling the user to add something) which would show the heuristic help users recognise, diagnose and recover from errors better.
 it could also add a pop up giving suggestions when entering an email(when most of the email has been entered it can give suggestions like @gmail.com or @outlook.com etc) which would reduce the users memory load by making options visible and make actions faster and easier as the user won't have to remember as much (recognition rather than recall).
The interface could also improve error prevention by making sure the user input is not invalid (it let the user enter a invalid email and continue) because things like that could cause problems later and it might be hard for the user to find what is wrong(error prevention).
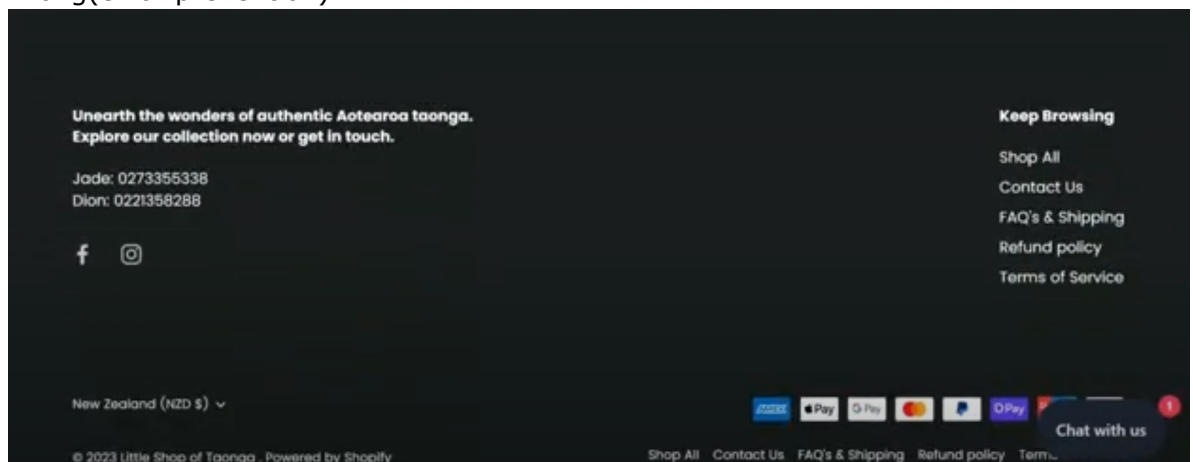
The help option is at the bottom of the page and in small letters amongst a lot of other mostly irrelevant information which makes it hard to find and this can cause problems if the user is stuck and needs help. It could be improved by moving it to the top of the page which would show the heuristic aesthetic and minimalist design by making relevant information easier to find which would save time and help users fix problems they may have while doing their task.

Merit

Subject: Digital Technologies

Standard: 92006

Overall grade: 06

Grade	Marker commentary
M6	The candidate has described the role of their interface.
	They have accurately identified a different heuristic for three activities.
	They have explained and evaluated the application of three heuristics in the unfamiliar interface. The explanations are brief but explain clearly how the application of heuristics improved the usability of the interface. They have included screenshots to illustrate their answers.
	In their comparison of the two interfaces, the candidate twice described the application of heuristics in each interface, rather than evaluating their effectiveness.
	They suggested one improvement for each interface. The suggested improvements are not justified by referring to usability heuristics or mātāpono Māori.