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## Level 1 Digital Technologies 2024

**92006 Demonstrate understanding of usability in human-computer interfaces**

# EXEMPLAR

**Excellence**

**TOTAL 08**

## Page 1

### INSTRUCTIONS

The task in this assessment is in five parts:

- Part A – Short-answer questions
- Part B – Matching question
- Part C – Interface you have studied
- Part D – Scenario questions
- Part E – Real-world examples.

In Part D, you are required to discuss the usability of the interfaces in terms of *mātāpono* Māori (Resource A) or the usability heuristics (Resource B).

In Part E, you may play, pause, and restart the videos as often as you like.

**Note:** *the videos have no sound.*

Read all parts of the task before you begin writing.

Usability principles can refer to any of the following:

### RESOURCE A: *Mātāpono* Māori

*Mātāpono* Māori relevant to usability could include:

- 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



#### 10. Help and documentation.

Source (adapted): Nielsen, J. (1994, updated 2020), *10 Usability Heuristics for User Interface Design*. Nielsen Norman Group.  
<https://www.nngroup.com/articles/ten-usability-heuristics>

### RESOURCE C: Usability concepts

- Internal and external consistency
- Accessibility.

## PART A – Short-answer questions

(i) What does accessibility refer to when applied to human-computer interfaces?

B I U

Interfaces should be friendly, accessible and easy to use for **all** users. It should be inclusive and cater different people's needs without leaving people out. For example, when designing an interface, it should be considered that people with poor eyesight might not be able to read small fonts, and people with color blindness might not be able to use the interface effectively if the interface relies heavily on colors for instructions. Also, foreigners that are unfamiliar to the language might experience difficulty when using the interface. It is important to consider those factors and add features like larger fonts and different language options available at a place easy to find.

(ii) Give a definition **and** example of Nielsen's heuristic 'Error prevention'.

B I U

Error prevention is the prevention of errors from occurring in the first place when designing interfaces or products. Error prevention is better than recovery options as it is faster, more efficient and reduces user frustration. It should prevent the users from making unintentional mistakes for better experience and efficiency. For example, in a date picker element inside a booking interface, days that are not available like September 31st or February 30th should not be included. It also shouldn't allow users to pick a date in the past by greying the dates out.

(iii) Identify and describe one usability principle that can be seen on the image below.



Usability principle:

Description:

B I U

Recognition rather than recall means the interface should make options and objects visible to the users. Information should be easily retrievable for the users. By listing possible options or making suggestions, it reduces memory load for the users so they don't have to memorise exact names or options, and it becomes more accessible for people that have bad memory. Recognition is faster and more efficient than recall, and it is less error-prone. In the example, it is addressed in the interface by listing all the possible cinemas out, so the users do not have to recall from their own memory, speeding up the process, making it more accessible and requiring less effort.

- (iv) The image below has been reproduced with labels numbered 1, 2, and 3. At each of these numbers, one or more of Nielsen's usability heuristics can be observed. Refer to Resource B for a full list of usability heuristics.



1. Which heuristic(s) can be seen at number 1?

B I U

User control and freedom, Aesthetic and minimalist design, Consistency and standards

2. Which heuristic(s) can be seen at number 2?

B I U

Match between the system and the real world, Recognition rather than recall, Aesthetic and minimalist design, Consistency and standards

3. Which heuristic(s) can be seen at number 3?

B I U

User control and freedom, Aesthetic and minimalist design, Flexibility and efficiency of use, Match between the system and the real world, Consistency and standards

- (v) Why should usability principles be considered and applied to human-computer interfaces?

B I U

Interfaces are not only for the designers but also for the users, and the users are an important part of interfaces. Interfaces should be accessible, effective, efficient and easy to use, and usability principles are considered to make the interface better for the users. They make the interface require less effort to use, reduce user frustration and make it less error-prone. Interfaces with bad usability considerations can lead to serious disasters and cost lives, one example being the Boeing plane crash. People can be dumb sometimes and fail on completing their intention, and by considering usability principles like consistency, memory and cognition load, response times and addressing them using heuristics and such, the interface will become truly effective, and people will actually want to use the interface.



## PART B – Matching question

In this question, match Nielsen's usability principles with their description.

Number	Description of usability principle
1	All interface elements should be consistent within the website or application.
2	The interface should follow common practices followed on websites.
3	The interface should reduce unnecessary elements and simplify the layout.
4	The interface should always keep users informed about what is going on, through appropriate feedback within a reasonable time.
5	A message showing that the level of stock is low.
6	The importance of providing clear assistance and guidance to users whenever they need it.

In the table below, enter the number of the description that correctly matches each usability principle.

One of these has been completed for you.

Aesthetic and minimalist design	3	Visibility of system status	4
Consistency and standards	1,2	Help and documentation	6

## PART C – Interface you have studied

In the following question you will refer to an interface you have studied.

Name of your interface:

Explain how effectively two usability principles were implemented in your chosen interface, and how they allowed the interface to achieve its purpose.

Usability principle (1):

**B** *I* U

The interface effectively addresses match between the system and the real world. Match between the system and the real world means that the interface should use language, concepts and metaphors that the users are familiar to, and following real life conventions and norms. It reduces cognition load by leveraging user's prior knowledge, and making things predictable, easy to understand and learn. Making things and functions predictable reduces the learning curve of the interface, making it more accessible, efficient, and less error-prone.

In the woolworths interface, the symbol of a magnifying glass is used in the search bar, indicating its function for searching, as magnifying glass has connotations of searching, like in a detective novel. Another example is the symbol of shopping cart being used at the shopping cart where you store the things you wish to purchase. This also aligns with real life ideas and concepts in shopping, as users use the woolworths interface to shop. This means that people with little to none prior knowledge in digital interfaces and people unfamiliar with the language can still use the interface without too much struggle, making the interface more accessible. Match between the system and the real world means that users can shop in the interface without needing much things to learn, as the interface is focused on online shopping where people buy things online, which is a daily life feature, and shouldn't require too much technical knowledge.

Usability principle (2):

**B** *I* U

The interface effectively addresses user control and freedom. User control and freedom for an interface means that users should be able to undo and redo actions, or exit unwanted states without much difficulty. This means that users can always find a clear "back" or "cancel" button to revert or reattempt their actions, and get out of unwanted states easily. This reduces the users' frustration as they won't feel stuck at any state, and they won't be punished if they are not familiar with the interface. Having user control and freedom also means that the user can freely explore the interface and making various actions without costs when learning the interface. The users will be able to compare different options by going to the last steps when they need to compare two things.

In the woolworths interface, there is a clear, obvious back arrow button on the page. The users can use it and go back to past pages to pick up things they forgot, or undo unintentional actions. The back button also allows the users to compare different products, choosing the better option. The users can delete things in their shopping cart with a click of the cross button, so they are not forced to purchase things they don't want. The user can also go out of the transaction with the back button if they change their mind, demonstrating user freedom.

By addressing user control and freedom, users are able to compare products online and make payments, while having the right to fix their mistakes, and making sure that they receive the items they wanted correctly, fitting the intention of the online shopping interface.

## PART D – Scenario questions

Choose ONE of the following scenarios and write your answer in the box below.

- (a) The school website needs updating. Discuss ways of incorporating Māori principles, such as integrating te reo Māori and honouring tikanga Māori, into the update of the website and its content. Discuss at least two practical examples of applying Māori usability principles to ensure the interface effectively serves the needs of the whole school community.

OR

- (b) Imagine you are developing a program for students to use in the library to reserve laptops. How would you apply usability principles to create an interface that meets their needs? Discuss at least two Nielsen's usability principles you would consider, and how you would implement them.

Scenario chosen:

☐ (a)

☒ (b)

Write your answer here.

B I U

I would first consider aesthetic and minimalist design, as laptop reservation can be a simple process, too much information won't be useful, and makes the action less efficient. Aesthetic and minimalist design means that dialogues won't include irrelevant information or information that will rarely be used. And, visual elements should not clutter up the page. The interface should reduce unnecessary elements and simplify the layout. Excess elements and information increases the cognition load for users, and simplified layout on the other hand helps the users focus and direct to their goals. I would implement the idea by first simplifying the layout, only keeping the important elements like login details, laptop availability and such. I will unify the font size and style across the interface, and use a restricted color scheme with maximum of 4 colors. I will also simplify dialogues so they contain only useful information. Excess element will only distract the users from their goals whilst making the interface elegant, and laptop reservation interface is not intended for entertainment.

I would also consider flexibility and efficiency of use. Flexibility and efficiency of use means that the interface should cater to both novice and experienced users by offering shortcuts and customization options. This ensures that users new to the interface should have no trouble using the interface, while the experienced users are provided with accelerators to speed up the tasks. Laptop reservation can be a repetitive process, and accelerators can definitely be valuable. I would implement the principle by offering keyboard shortcuts like ctrl-s, ctrl-y and such that performs a sequence of actions like automated reservation, reducing the effort required for experienced users. In the mean time I would be sustaining the normal ways to perform actions, ensuring effective use for novice users. I would also implement a feature where users can choose to save log in details with a pop-up dialogue for permission, as it can be a repetitive action, and the option to save log in details can make the process more efficient for both novice and experienced users that wish to make a laptop reservation



## PART E – Real-world examples

- (i) Compare the usability of BOTH real-world examples below in terms of usability heuristics. Video 1 and Video 2 below show the user setting up an account on two different websites. Discuss **at least two** usability principles in your answer.

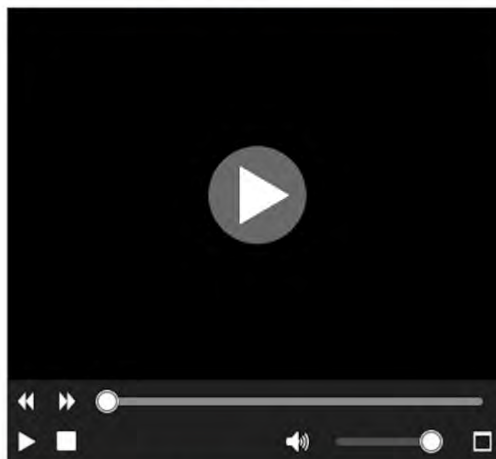
It is recommended that you view all videos below in 'full screen' mode, by clicking the screen icon in the bottom-right corner of the video window. To exit this mode, click the screen icon in the bottom-right corner of the enlarged screen window.

Video 1: Noku



Source: <https://noku.co.nz>

Video 2: Air New Zealand



Source: <https://www.airnewzealand.co.nz>

Write your answer here.

B I U

One similarity between the two interfaces is that both interface addresses recognition rather than recall. Both interface has a dropdown list for region suggestions when the user tries to enter residence details. By listing possible residential it reduces memory load for the users so they don't have to memorize exact spellings, becoming more accessible. Recognition is faster and more efficient than recall, and it is less error-prone, meaning that the chance of the users entering the wrong details is lower. It also makes the registration process more efficient, as users only need to choose the correct one.

The Air Nz interface further demonstrates recognition rather than recall by having dropdown listing for titles and date of birth. This further increases the efficiency of the interface as users are required to type less, but it can also bring some problems as users can potentially choose an invalid date of birth, for example, 31st April, 1820.

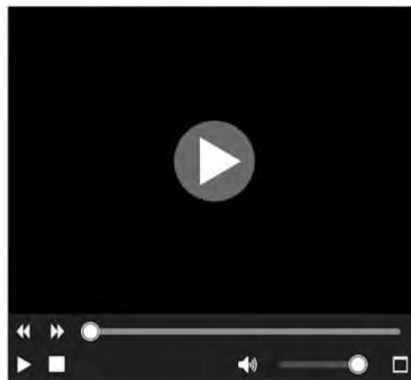
Both interfaces also addresses aesthetics and minimalist design, where a limited color scheme of about 4 colors is used, and the fonts are unified. This helps reduce the cognitive load of users, helping them focus on their tasks, whilst making the interface look elegant.

One difference between the two interfaces is that the Air Nz interface clearly addresses visibility on system status, whilst Noku doesn't clearly show as much. Visibility on system status is where the interface informs the user on what is happening with appropriate feedback within reasonable time. Air Nz has a breadcrumb trail in the registration element that shows the user which of the three sections they are currently in, helping them to be more confident in their actions, and avoiding errors where users might think that they haven't completed the action, registering again. Noku does not have a message that shows the system status after registration, which can make users feel unsure and repeat their actions.

Though in both interfaces, parts of visibility on system status can be shown where it highlights the box the user is entering into, helping users fill out the registration form, even if they have little prior knowledge on digital interfaces.

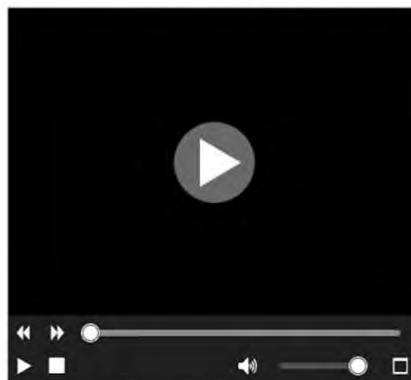
- (ii) Compare the usability of BOTH real-world examples below in terms of usability heuristics. Video 3 and Video 4 below show the user adding and removing an item from a playlist on two different websites. Discuss **at least two** usability principles in your answer.

Video 3: Spotify



Source: <https://www.spotify.com>

Video 4: Other playlist



Source: <https://music.youtube.com>

Write your answer here.

B I U

One similarity between the two interfaces is that both interface addresses consistency and standards. This means that user shouldn't wonder whether different actions, objects and options mean the same thing. The interface should follow platform conventions. External consistency is consistency between two different interfaces, and as shown in the videos, both interfaces used the same triangle symbol for play, next/last song, shuffle and such, and the layout is also similar with the details at middle right, key functions on the left, and current song playing down at the bottom. This means that song listening will be a simple action for people that have experienced similar interfaces before. Internal consistency is consistency within a product or a family of products, and in this example both interface have the same styling, fonts and formatting within the interface, improving the aesthetics of it, and reducing the cognitive load on the users as it does not require them to learn everything over again. By addressing consistency and standards, it reduces the learning curve for the users as they are likely to have seen the same layout and formatting somewhere else, making it easier when learning to use the interface, reducing cognitive load. It will also increase the efficiency and make it less error-prone as it leverages on the users' prior knowledge, as users only intend to listen to songs, not learn 20 more terminologies. Both interfaces also addresses the visibility on system status, where it informs the user with a pop up when the user successfully adds or deletes a playlist, helping the users understand their actions.

One difference between the two interfaces is that Spotify addresses help and documentation better. Help and documentation is where interfaces provide help and documentation for users when needed. In the Spotify interface, when the user hovers over the three dots for more, it pops up with a dialogue "more options for ....", trying to help the users by giving more details. In the Edit Details element, it also includes help and documentation like "Add an optional description" and "By proceeding .... right to upload the image", guiding the users and giving out useful information. This ensures that the users are comfortable using the interface, regardless if they are familiar to digital interfaces or not. By incorporating help and documentation, it makes the interface more accessible to all kinds of users. Though, both interface included help and documentation in the search bar, "Search songs ...." for Youtube Music, and "What do you want to play?" for Spotify, giving users guidance for effective use. Youtube music's help and documentation just was not as much as Spotify.

- (iii) Suggest improvements for enhancing the usability of ONE interface from any of the four videos above. Justify your suggestions by referring to usability principles.

B I U

For Noku, the interface can improve the usability by addressing more visibility on system status. Noku does not have a clear, concise message that shows the system status after registration, notifying the users that the registration is complete, which can make users feel unsure and repeat their actions. Users need to go back to their profile to see the registration status, which is not efficient. Noku can instead add a pop-up message that shows the registration is complete, informing the users and making them more confident. The interface can also address more error prevention. During the registration, the user is prompted to enter the city by themselves. If they make a typo, an error can occur and products can even be shipped to a fake address. Recovery options are always more complicated than error prevention. Instead, it can add a drop down box for residential details, also demonstrating recognition rather than recall. By listing possible residential it reduces memory load for the users so they don't have to memorize exact spellings, becoming more accessible. Recognition is faster and more efficient than recall, and it is less error-prone, meaning that the chance of the users entering the wrong details is lower. It also makes the registration process more efficient, as users only need to choose the correct one. It also promotes accessibility and considering for all users, as users with bad memory can also use the interface effectively.



## Excellence

**Subject:** Digital Technologies

**Standard:** 92006

**Total score:** 08

Task	Grade score	Marker commentary
One	E8	<p>The candidate has produced a detailed response and was confident in their understanding of usability heuristics (UH). They were able to explain and evaluate the use of UH with reference to the impact on the user.</p> <p>The candidate compared similarities and differences of the interfaces in terms of the questions asked, and made and explained a judgement as to which interface was better. They also suggested sensible relevant improvements.</p>