Computing Technology Stage 5 (Year 10) – teacher support resource

Enterprise systems – designing for user experience

# Teacher support resource

**Teacher note:** this resource has been designed to facilitate the ready conversion into a student booklet by removing the answers within the response windows. Teacher notes can be deleted before distributing to students.

Student name:

Class:

Teacher:

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# Unit overview

In this unit students will develop a fundamental understanding of designing for user experience. Students will investigate different platforms and learn about designing an app and using virtual and augmented reality. Students will be guided through the design production process and use an iterative approach in developing user experiences.

During Weeks 1 to 5 of the learning sequence, students will gain an understanding of the evolution of the development and impacts of user interfaces and interactive media, they will explore the functional and non-functional requirements of a variety of media, and will examine real-world problems evaluating social, ethical and legal impacts.

During Weeks 6 to 10 of the learning sequence, students will work to design and author a data dashboard utilising simulated or live data with consideration to privacy and cybersecurity. Students will demonstrate their understanding of presenting data by utilising filters and functions, making predictions and identifying trends and outliers.

During Weeks 11 to 18 of the learning sequence, students will explore augmented reality (AR), mixed reality (MR), and virtual reality (VR) to understand how they develop immersive experiences. They will learn to effectively plan and oversee projects through an iterative approach. Students will also engage in the design and authoring of an interactive media product, while honing skills in managing, documenting, and explaining work practices during project development.

During Weeks 19 to 20 of the learning sequence, students will gain the skills to critically evaluate their own projects as well as those of their peers. They will develop a deep understanding of project assessment and feedback processes. Additionally, students will explore various career opportunities within the realms of user interface (UI) design and interactive media. This will provide them with insights into potential professional pathways in the field and help them make informed decisions about their future endeavours.

**Teacher note:** the focus area of designing for user experience can be delivered using a range of platforms. This focus area can blend with other focus areas in delivery.

# Assessment task 3 overview

**Type of task:** design 2 wireframe prototypes for an app and create a ‘Designing for user experience’ research report.

**Outcomes being assessed:**

A student:

* manages, documents and explains individual and collaborative work practices **CT5-COL-01**
* explains how data is stored, transmitted and secured in digital systems and how information is communicated in a range of contexts **CT5-DAT-01**
* communicates ideas, processes and solutions using appropriate media **CT5-COM-01**

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Individually you are to research user experience and create a report showcasing your idea for an app and design 2 wireframes for your digital product.

Investigate a real-world problem or need that can be solved by developing an app which focuses on user experience design.

Your task will include identifying the purpose of your app, including the intended target market and the intended use.

To understand the user, you will break down the user experience into manageable parts including functional and non-functional requirements and describe the data flow.

Your task will include creating 2 wireframes to demonstrate the effectiveness of the design and should include media element placement, interactive components and links.

## Steps to success

Table 1 – assessment preparation schedule

|  |  |
| --- | --- |
| Steps | What I need to do/when I need to do it |
| Develop a report to document your software requirements specification | Prepare a document that will contain all required research and information for the report as outlined below. |
| Identify your chosen area/market for your app | Select from the following options:* pet tracker
* enhance posture
* watering plants
* shopping map
* smart fridge recipe generator
* fitness
* games account tracker
* chores.
 |
| Develop an introduction  | Define and describe the purpose of your app, including the intended target market and the intended use. |
| App description | Explain the user needs for your app including who will be using it and how. What information is required for the app? |
| Functional requirements | Develop a functional requirements table for your chosen app including interface requirements. |
| Non-functional requirements | Develop a non-functional requirements table for your chosen app including performance, security and quality. |
| Data flow | Explain how data will be inputted, stored, transmitted, processed and outputted. |
| Wireframe | Create 2 wireframe prototypes of your app that meet the requirements you have set. This should include media element placement, interactive components and links. |

## What is the teacher looking for?

Students are to document and explain individual work practices as they develop a concept for an app and plan 2 wireframe prototypes.

This task will require students to choose from a list of relevant real-world problems or issues they can investigate. Their real-world problem should be researched to ensure they create an app that meets user expectations.

Understanding how to effectively use planning tools to enhance the user experience will be a pivotal focus for students.

# Assessment task 4 overview

**Type of task:** design for user experience product with planning and documentation.

**Outcomes being assessed:**

A student:

* selects and applies safe, secure and responsible practices in the ethical use of data and computing technology **CT5-SAF-01**
* applies iterative processes to define problems and plan, design, develop and evaluate computing solutions **CT5-DPM-01**
* communicates ideas, processes and solutions using appropriate media **CT5-COM-01**
* applies computational, design and systems thinking to the development of computing solutions **CT5-THI-01**
* acquires, represents, analyses and visualises simple and structured data **CT5-DAT-02**
* designs and creates user interfaces and the user experience **CT5-DES-01**

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Design an app with a multimedia element that you have previously planned in Assessment task 3.

In pairs or small groups, you will be creating a prototype user interface utilising Adobe XD with an interactive media element created utilising Adobe Aero and an embedded link or QR code.

In Assessment task 3 you chose an option from the following:

* pet tracker
* enhance posture
* watering plants
* shopping map
* smart fridge recipe generator
* fitness
* games account tracker
* chores.

Evaluating the ideas generated in Assessment task 3, choose a theme that you will utilise in the development of an Adobe XD prototype app and corresponding augmented reality (AR) component. You will utilise Adobe Photoshop, Illustrator or Adobe After Effects to create assets to produce an interactive component for your app.

You will utilise an iterative approach in your design and authoring of your interactive multimedia product.

## Steps to success

Table 2 – assessment preparation schedule

|  |  |
| --- | --- |
| Steps | What I need to do/when I need to do it |
| Record all steps of development in creating the interactive experience prototype | * Create an extensive record of project development that accurately illustrates the iterative journey of completing the design, creation and troubleshooting of your app.
* The record of development contains detailed and accurate lesson by lesson accounts of work completed which includes discussions, evaluations, images and milestones precisely timestamped and presented in a professional manner.
 |
| Design a storyboard of your app | * Plan and design your interactive media app so that it demonstrates excellent functionality, accessibility, usability and aesthetics with attention to privacy and cyber security considerations.
 |
| Create your Augmented Reality assets | * Plan and create excellent assets for use in the development of an AR media element.
* Apply extensive skills in the development of 2D and 3D designs utilising a variety of tools.
 |
| Develop your Augmented Reality in Adobe Aero | * Compile and present your assets in a creative and well organised way to ensure user engagement and enhance the user experience with the app.
 |
| Create your Adobe XD prototype app | * Create a user experience based on your chosen theme that demonstrates excellent functionality, usability, accessibility and aesthetics.
 |
| Evaluate your app using functional and non-functional requirements and test criteria | * Evaluate your final app against the functional and non-functional requirements outlined in Assessment task 3, highlighting areas of success and areas of improvement.
 |

## What is the teacher looking for?

Students are to plan, design and develop a solution to a real-world problem. They are to manage and document their progress and processes in the development of the final solution.

The task will require students to investigate and utilise iterative design to produce an excellent Adobe XD prototype app that has an AR interactive element. This will require students to develop critical skills in the use of authoring tools to create a user-centred user interface that engages through interactivity.

Understanding how to balance functionality, accessibility and usability with interactivity will be a pivotal focus for students.

A final evaluation by students that critically evaluates the final solution against the functional and non-functional specifications is highlighted in Assessment task 3.

# Glossary

Many of the following words will gather more meaning to you as you work through this booklet.

Each time you see an unfamiliar word in bold throughout this workbook you can add its definition in the table below in case you need to refer back later.

|  |  |
| --- | --- |
| Word | Definition |
| ‘Terms of Use’ policies | Terms of Use (TOU) policies are legal agreements that outline the rules and guidelines that users must follow when using a website, mobile app, or other online service. They typically include information such as what the service is, how it can be used, and any limitations on use. TOU policies also often include information about intellectual property rights, user conduct, and liability limitations. |
| Augmented Reality (AR) | Augmented Reality (AR) refers to a technology that enhances a user's perception of the real world by overlaying digital information on top of it. The digital information displayed in AR can include text, images, 3D models, and even animations. |
| End User License Agreements (EULA) | An End-User License Agreement (EULA) is a legal contract between the manufacturer or distributor of a product, such as software, and the end user. It outlines the terms and conditions under which the user is allowed to use the product, as well as any limitations on that use. EULAs often include information about the product's intellectual property rights, warranty information, and liability limitations. They are typically presented to the user as a pop-up window or dialog box when installed. |
| Functional requirement | Functional requirements define the software's goals, meaning that the software will not work if these requirements are not met. |
| Interactive media (IM) | Interactive media refers to any form of media, such as video games, interactive websites, and mobile apps, that allows the user to actively engage and interact with the content, rather than just passively consuming it.This interaction can take many forms, such as clicking on links, making selections, providing input, or manipulating virtual objects. Interactive media allows users to explore and control the content, creating a more engaging and personalised experience. |
| Lossless compression | Lossless compression is a method of data compression that reduces the size of a file without losing any data. The process of lossless compression is reversible, which means that the original data can be restored once the file is decompressed. Lossless compression is often used for text, code and other types of data where losing any information would not be acceptable. |
| Lossy compression | Lossy compression is a method of data compression that discards some of the data in a file to reduce its size. The process of lossy compression is irreversible, which means that the discarded data cannot be recovered once the file is compressed. Lossy compression is often used for image, audio and video files, where the human eye or ear can't detect the loss of quality. |
| Mixed Reality (MR) | Mixed Reality (MR) is a term used to describe a continuum between the real and virtual worlds, where physical and digital objects co-exist and interact in real-time. It is a combination of Augmented Reality (AR) and Virtual Reality (VR) and it creates a hybrid environment where the user can interact with both the real and virtual world. |
| Non-functional requirement | A non-functional requirement is a [requirement](https://en.wikipedia.org/wiki/Requirement) that specifies criteria that can be used to judge the operation of a system, rather than specific behaviours. They are contrasted with [functional requirements](https://en.wikipedia.org/wiki/Functional_requirement) that define specific behaviour or functions. |
| Personally Identifying Information (PII) | Personally Identifying Information (PII) is any information that can be used to identify an individual, such as their name, address or date of birth. PII can also include sensitive information such as financial information, medical records, or biometric data. PII is often collected by organisations for various reasons, such as conducting transactions, providing services or for marketing purposes. |
| Privacy | The degree to which an individual can determine which personal information is to be shared with whom and for what purpose. |
| Test case | A test case is a set of actions performed on a system to determine if it satisfies software requirements and functions correctly. |
| Use case | A use case is a description of the ways in which a user interacts with a system or product. |
| User Experience (UX) | User experience (UX) is the overall experience of a person using a product, system or service, including the interface, graphics, industrial design, physical interaction, and the manual. It encompasses how a user feels about the usefulness, ease of use, and efficiency of a product or service. |
| User Interfaces (UIs) | A user interface (UI) is the point of interaction between a user and a computer or other electronic device. It consists of the visual and/or auditory elements that a user interacts with to perform tasks, such as buttons, text fields, menus, and other controls. |
| Virtual reality (VR) | Virtual reality (VR) refers to a computer-generated simulation of a three-dimensional environment that can be interacted with using specialised hardware, such as a head-mounted display (HMD) or gloves fitted with sensors. The user is immersed in this environment and can interact with it as if it were real. |

**Teacher note:** for students with an EALD background, a completed glossary can be provided so that they have additional time to understand the key terms with bilingual dictionaries. The glossary can be provided to students in their preferred communication mode.

# The design and production process

Throughout your study of Computing Technology, you will learn about design processes and how to apply them. You will explore different types of design processes and learn how to apply them in your design project.

The design and production process:

* involves a sequence of organised steps which provide a solution to design needs and opportunities
* may take a few seconds or minutes, such as when you select what clothes to wear, or may take years as in the case with the design of a motor vehicle
* may involve one person or may involve many people
* may be simple or complex, depending on the task
* involves questioning (or evaluating) throughout the iterative process.

Figure 1 – flowchart of design and production process



# Identifying and defining

## What is the user experience?

As a class, students watch [user interfaces and user experience](https://www.youtube.com/watch?v=5CxXhyhT6Fc) (10:07). Discuss the concepts and purpose of designing and compare the roles of user interface and user experience.

Define the following concepts in the space below.

What is a user interface (UI)?

|  |
| --- |
| **Sample answer:**A user interface (UI) is the point of interaction between a user and a computer or other electronic device. It consists of the visual and/or auditory elements that a user interacts with to perform tasks, such as buttons, text fields, menus, and other controls.A well-designed UI allows a user to easily navigate and use the device or application, making their experience more efficient and enjoyable. UIs can be found on a variety of devices, including computers, smartphones, and other consumer electronics. |

What is a user experience (UX)?

|  |
| --- |
| Sample answer:User experience (UX) is the overall experience of a person using a product, system or service, including the interface, graphics, industrial design, physical interaction, and the manual. It encompasses how a user feels about the usefulness, ease of use, and efficiency of a product or service.Good UX design aims to make products and services easy and efficient to use, and to create a positive emotional connection with the user. This can be achieved through conducting user research, testing, and iterative design. A positive user experience can lead to increased customer satisfaction, loyalty, and advocacy. |

What is interactive media (IM)?

|  |
| --- |
| Sample answer:Interactive media refers to any form of media, such as video games, interactive websites, and mobile apps, that allows the user to actively engage and interact with the content, rather than just passively consuming it. This interaction can take many forms, such as clicking on links, making selections, providing input, or manipulating virtual objects. Interactive media allows users to explore and control the content, creating a more engaging and personalised experience.The interactivity level can vary depending on the medium, for example, a website with a few buttons to click on would be less interactive than a video game where the player can move around, solve puzzles and interact with the environment.Interactive media allows for a more immersive experience and can offer new possibilities for storytelling, education, and communication. It also provides a way for users to express themselves and create their own content. |

### Real world applications

**Look at different systems and identify UI and UX design aspects.**

In the space below, [brainstorm](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/542#.ZC4skSv0RLg.link) the many ways design aspects for UI and UX are used.

|  |
| --- |
|  |

Facilitate a class discussion and analysis on the variety of interactive media and the UI and UX design aspects of each, for example, mobile applications, web applications, game console dashboards and smart wear device interfaces.

Students evaluate a variety of user interfaces constructing a [PMI table](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/551?clearCache=62525afb-d641-4043-9450-5b38c479d16).

In the tables below categorise UI and UX design aspects of mobile or web apps, game consoles or smart wear devices.

**Teacher note:** sample answers are provided in the tables below. These can be deleted when distributing to students as a resource.

|  |  |
| --- | --- |
| Aspects | Mobile and web apps |
| Identify UI design aspects | **Sample answers:**Navigation: the layout and organisation of the mobile or web app's pages, menus, and buttons, making it easy for users to find what they need and move around the app.Visual design: the use of colour, typography, and imagery to create a visually appealing and consistent design that reflects the mobile or web app's brand and style.Interaction design: the way in which users interact with the mobile or web app, including the use of forms, buttons, and animations.Feedback: the way in which the mobile or web app provides feedback to users, such as through visual cues, animations, and messages, to confirm their actions and show the results of their input. |
| Identify UX design aspects | **Sample answers:**Usability: the ease with which users can complete their tasks and achieve their goals within the mobile or web app.Accessibility: the mobile or web app's ability to be used by people with disabilities or other special needs.Performance: the mobile or web app's speed and responsiveness, as well as its ability to handle large amounts of data and work offline.Security: the mobile or web app's ability to protect user's data and privacy.Personalisation: the web app's ability to adapt to the user's preferences and behaviour.Learnability: how easy it is for a user to understand and use the mobile or web app, even if they have never used it before.Error tolerance: how well the mobile or web app handles errors and unexpected events, providing clear and meaningful feedback for the user. |

|  |  |
| --- | --- |
| Aspects | Game consoles |
| Identify UI design aspects | **Sample answers:**Navigation: the layout and organisation of the game console's menu, allowing users to easily access and navigate through different features and options, such as games, settings, and online features.Visual design: the use of colour, typography, and imagery to create a visually appealing and consistent design that reflects the game console's brand and style.Interaction design: the way in which users interact with the game console, including the use of buttons, joysticks, and other physical controls.Feedback: the way in which the game console provides feedback to users, such as through visual cues, animations, and sounds, to confirm their actions and show the results of their input. |
| Identify UX design aspects | **Sample answers:**Usability: the ease with which users can complete their tasks and achieve their goals within the game console.Accessibility: the game console's ability to be used by people with disabilities or other special needs.Performance: the game console's speed and responsiveness, as well as its ability to handle large amounts of data and work offline.Security: the game console's ability to protect user's data and privacy.Personalisation: the game console's ability to adapt to the user's preferences and behaviour.Error tolerance: how well the game console handles errors and unexpected events, providing clear and meaningful feedback for the user.Compatibility: the ability of the game console to work seamlessly with other devices and platforms, such as smartphones, tablets, and online services. |

|  |  |
| --- | --- |
| Aspects | Smart wear devices |
| Identify UI design aspects | **Sample answers:**Navigation: the layout and organisation of the smart wear device's interface, allowing users to easily access and navigate through different features and options.Visual design: the use of colour, typography, and imagery to create a visually appealing and consistent design that reflects the smart wear device's brand and style.Interaction design: the way in which users interact with the smart wear device, including the use of touchscreens, buttons, and voice commands.Feedback: the way in which the smart wear device provides feedback to users, such as through visual cues, vibrations, and sounds, to confirm their actions and show the results of their input. |
| Identify UX design aspects | **Sample answers:**Usability: the ease with which users can complete their tasks and achieve their goals within the smart wear device.Accessibility: the smart wear device's ability to be used by people with disabilities or other special needs.Performance: the smart wear device's speed and responsiveness, as well as its ability to handle large amounts of data and work offline.Security: the smart wear device's ability to protect user's data and privacy.Personalisation: the smart wear device's ability to adapt to the user's preferences and behaviour.Battery life: the battery life of the smart wear device is also a crucial aspect for user experience as it directly impacts the usability of the device. |

Interactive media refers to any form of media, such as video games, interactive websites, and mobile apps, that allows the user to actively engage and interact with the content, rather than just passively consuming it.

This interaction can take many forms, such as clicking on links, making selections, providing input, or manipulating virtual objects.

Interactive media allows users to explore and control the content, creating a more engaging and personalised experience.

What are elements of interactive media? Complete the table below.

**Teacher note:** sample answers are provided under the ‘Description of interactive media element’ heading in the table below. These can be deleted when distributing to students as a resource.

|  |  |
| --- | --- |
| Element | Description of interactive media element |
| **User input** | This includes various forms of input such as keyboard, mouse, touch, voice, and gesture input. |
| **Feedback** | This includes visual, auditory, and haptic feedback that confirms to the user that their input has been received and processed. |
| **Interactivity** | The ability of the user to interact with the content, such as by selecting options, manipulating virtual objects, or exploring different paths. |
| **Non-linear** | The ability of the user to navigate through the content in a non-linear way, such as by choosing their own path or making decisions that affect the outcome of the experience. |
| **Adaptability** | The ability of the interactive media to adapt to the user's preferences, behaviour, or environment, such as by adjusting the difficulty level or providing personalised content. |
| **Simulation** | The ability of interactive media to simulate real-world scenarios, such as through 3D graphics, physics simulations, or artificial intelligence. |
| **Multi-user** | The ability of interactive media to support multiple users at the same time, such as through online multiplayer games or virtual reality experiences. |

What does integration of information technologies involve? Answer in the space below.

|  |
| --- |
| ****Sample answer:****The integration of information technologies (IT) involves the process of combining various hardware, software, and communication systems to work together to achieve a specific goal or set of goals. IT integration can involve a wide range of activities, such as:Data integration: this involves the process of combining and consolidating data from different sources into a single, unified system. This can include data warehousing, data mining, and data modelling.Application integration: this involves the process of connecting different software applications and systems to work together seamlessly. This can include the use of application programming interfaces (APIs) and middleware to connect different systems and enable them to share data and functionality.Hardware integration: this involves the process of connecting different hardware components and devices to work together seamlessly. This can include the use of networking technologies, such as LANs and WANs, to connect different devices and systems and enable them to share data and functionality.Communication integration: this involves the process of connecting different communication systems, such as email, instant messaging, and video conferencing, to work together seamlessly. |

**Static vs dynamic content**

Static content remains constant and fixed, and it's mainly used to provide information.

Dynamic content is interactive, changeable, and is used to create a more engaging experience, allowing the user to interact with the content and see the results of their actions in real-time.

Using an example, describe static content. Answer in the space below.

|  |
| --- |
| ****Sample answer:****Static content refers to content that does not change or is not affected by user input. An example of static content in interactive media is a webpage that displays information about a product. The user can scroll through the page, click on links, and interact with various elements of the page, such as buttons and forms, but the content of the page remains the same. The user can't change the information displayed on the page as it is fixed. |

Using an example, describe dynamic content. Answer in the space below.

|  |
| --- |
| ****Sample answer:****Dynamic content refers to content that changes or is affected by user input. An example of dynamic content in interactive media is a stock market simulation app. The user can input different stock symbols, adjust the time frame, and view the simulated performance of the stocks over time. The app uses real-time stock market data to update the information and generate new charts and graphs, which change as the user makes different selections. The user can interact with the app and the content changes in response to the user's input. |

### Components of user interfaces or interactive media

In user interfaces or interactive media, there are components of the system:

* Inputs
* Storage
* Transmission
* Processes
* Outputs

Figure 2 – system components



**Case study: Adobe Creative Types**

****View the [Adobe Creative Types](https://mycreativetype.com/) website and examine the inputs, storage, transmission, processes and outputs.

What inputs are present for the user?

|  |
| --- |
| Sample answers:The participant answers from 2 choices. There are 15 questions. The participant interacts using their mouse to click on their response and browse the information on their creative type. |

What media is involved and how would it be stored?

|  |
| --- |
| Sample answers:The participant answers a question and interacts with the media in their browser window.The participant views a 15 second animation between each response and can choose to mute or skip this step.The animation and interactive media is stored on a server including the participants responses. |

How is data transmitted within the website and between devices?

|  |
| --- |
| Sample answers:Data transmission within websites and between devices involves the transfer of information from one point to another, typically using various communication protocols and technologies. The Hypertext Transfer Protocol (HTTP) or its secure version (HTTPS) is commonly used for transmitting data between web clients and servers. HTTP/HTTPS defines how requests and responses are formatted and transmitted. |

What processes are being undertaken?

|  |
| --- |
| ****Sample answers:****System processes in user interfaces or interactive media refer to the tasks and operations that a digital system performs to provide a functional and responsive user experience. These processes can include tasks such as image processing, video decoding, audio playback, data encryption, and network communication. |

How does that affect the output visually?

|  |
| --- |
| ****Sample answers:****The participant is captured by the user experience and the visual impact of the interactive media content. The UI design process directly affects the visual output of the website. UI designers create layouts, colour schemes, typography, and graphical elements that contribute to the website's visual appeal. They aim to create an aesthetically pleasing and user-friendly interface. |

Choose a user interface or interactive media product that you have experience with and complete the following.

In the space below, identify the user interface or interactive media product you will examine.

|  |
| --- |
|  |

**Inputs**

System inputs in user interfaces or interactive media refer to the ways in which a user can interact with and provide input to a digital system.

These inputs can include things like keyboard strokes, mouse clicks and movements, touch gestures on a touchscreen, voice commands, and even physical actions like gestures or movements captured by a camera.

The specific inputs available will depend on the type of device and interface being used, but they are generally designed to be intuitive and easy for the user to understand and use.

In the space below, describe system inputs for your chosen example.

|  |
| --- |
|  |

**Storage**

System storage in user interfaces or interactive media refers to the ways in which a digital system stores and retrieves data. This can include a variety of storage types such as local storage on the device itself, cloud storage, or a combination of both. The local storage may include things like hard drives or solid state drives, while cloud storage uses remote servers to store data.

In user interfaces or interactive media, system storage is used to save user preferences, settings, and progress in a game or application. It also can be used to store media files like images, videos, and audio. The system storage can also be used to store data collected from the user's interactions with the interface such as browsing history, search queries, and other user-generated data. This data can be used to provide personalised experiences and improve the performance of the system.

Another important aspect of system storage in interactive media is the ability to save and recall the state of a system, allowing the user to pick up where they left off.

In the space below, describe storage for your chosen example.

|  |
| --- |
|  |

**Transmission**

System transmission in user interfaces or interactive media refers to the ways in which data is transmitted between different devices or between a device and a remote server. This can include wired or wireless communication methods, such as ethernet, wi-fi, or cellular data.

In user interfaces or interactive media, system transmission is used for a variety of purposes. For example, it can be used to transfer data between devices, such as syncing a mobile device with a desktop computer. It can also be used to send and receive data over the internet, such as streaming videos or music, or sending and receiving messages. System transmission is also used to connect devices to the internet and to access online services such as social media, cloud storage, and online gaming.

Additionally, system transmission also enables remote control and monitoring of the interactive media and devices, allowing for real-time adjustments, updates, and maintenance.

In the space below, describe transmission for your chosen example.

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**Processes**

System processes in user interfaces or interactive media refer to the tasks and operations that a digital system performs in order to provide a functional and responsive user experience. These processes can include tasks such as image processing, video decoding, audio playback, data encryption, and network communication.

In user interfaces or interactive media, system processes are often executed in the background, allowing the user to interact with the interface without interruption. For example, a media player may decode a video in the background while the user navigates through menus. Similarly, a game may load assets and perform physic simulations while the user plays.

Additionally, system processes are also responsible for performing input/output operations, such as reading and writing data to storage, sending and receiving data over the network, and displaying images and videos on the screen. These processes can be optimised to reduce latency and improve performance, which can enhance the overall user experience.

Overall, system processes are the backbone of user interfaces and interactive media, performing the necessary operations to provide a functional and responsive experience. These processes are managed by the system's operating system, which is responsible for allocating resources, managing memory, and scheduling tasks.

In the space below, describe processes for your chosen example.

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**Outputs**

System outputs in user interfaces or interactive media refer to the ways in which a digital system presents information to the user. These outputs can include things like text, images, videos, audio, and animations displayed on a screen, as well as haptic feedback through vibrations or force feedback. Additionally, system outputs can include the control of external devices like lights, motors, and actuators.

The specific outputs available will depend on the type of device and interface being used. The outputs are designed to be intuitive and easy for the user to understand and use, and the goal of the system is to provide the user with the necessary information or feedback in an efficient, clear and concise manner.

In the space below, describe outputs for your chosen example.

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### Functional and non-functional requirements

View [functional and non-functional requirements.](https://www.altexsoft.com/blog/business/functional-and-non-functional-requirements-specification-and-types/#:~:text=Functional%20requirements%20define%20what%20a,also%20known%20as%20quality%20attributes.)

* Functional requirements are features or functions that enable users to accomplish their tasks (user requirements).
* [Non-functional requirements](https://www.youtube.com/watch?v=fc-5HJPBZMQ&t=40s) (9:28) are how the system should perform (user expectation).

Describe the difference between functional and non-functional requirements of a UI or interactive media product. Answer in the space below.

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| ****Sample answer:****Functional requirements describe the specific features and functionality that a UI or interactive media product must have in order to meet the needs of its users. Examples of functional requirements for a UI might include the ability to navigate through different screens, the ability to input data, and the ability to view and edit data.Non-functional requirements, on the other hand, describe the overall performance and usability of the product, rather than specific features. Examples of non-functional requirements might include responsiveness, accessibility, scalability, and security. These requirements are usually quality attributes of the system and are not directly observable but can be measured.In summary, functional requirements describe what the product should do, while non-functional requirements describe how well the product should do it. |

Outline the functional and non-functional requirements for a console game in the table below.

**Teacher note:** sample answers are provided under the ‘Specify the functional requirements of a user experience’ heading in the table below. These can be deleted when distributing to students as a resource.

|  |  |
| --- | --- |
| Aspect | Specify the functional requirements of a user experience |
| **The purpose of a system** | A game console is an electronic device specifically designed for playing video games.The primary purpose of a game console is to provide an interactive entertainment experience for the user. |
| **Describe use cases** | 1. Playing video games: the primary use case of a game console is to play video games. Game consoles come with a variety of built-in games and allows the users to purchase and download games from an online store.
2. Entertainment: some game consoles also include built-in streaming services such as Netflix and YouTube, allowing users to watch movies, TV shows, and other video content. Some consoles also include music streaming services like Spotify and Apple Music.
3. Online gaming: many game consoles have built-in internet connectivity, which allows players to play online games with other people and also to access online features such as leaderboards, matchmaking, and multiplayer gaming.
4. Virtual reality: some newer game consoles support virtual reality (VR) technology, allowing players to immerse themselves in realistic, 3-dimensional worlds.
5. Remote Play: some game consoles allow the users to stream their games to other devices such as laptops, smartphones, and tablets, allowing them to play games on the go or on different devices.
6. Family and social use: game consoles are often used as a shared family or social activity, allowing multiple people to play games together on the same console.
7. Education and training: game consoles are also used in various fields such as education, training, and therapy. They can be used to teach and train in various fields such as medicine, engineering, and military training.
 |
| **Develop test cases of inputs** | 1. Button presses: testing the functionality of all buttons on the controller, including direction buttons, analogue sticks, triggers, and buttons for in-game actions.
2. Joystick and motion-sensing: testing the functionality of the joystick and motion-sensing features, such as tilt and motion controls.
3. Voice commands: testing the functionality of the microphone and voice commands, such as turning the console on/off or launching a specific game.
4. Touchscreen: testing the functionality of the touchscreen, such as scrolling, tapping, and swipe gestures.
5. Remote play: testing the ability to stream games from the console to other devices, such as a laptop or tablet, and testing the functionality of the remote play controls.
6. Remote and/or app control: testing the ability to control the console with a remote or an app, such as turning on/off, adjusting volume or launching specific apps or games.
7. Controller connectivity: testing the ability to connect different controllers to the console, such as wired or wireless, and testing the functionality of these controllers.
8. Sharing and streaming: testing the ability to share and stream gameplay, such as the ability to share screen, videos or audio to different platforms or devices.
9. Battery life: testing the battery life of the controllers and if there's a charging feature, testing the charging time and the charging process.
10. Hardware and peripherals: testing the compatibility of any additional hardware or peripherals, such as VR headsets, steering wheels, and keyboards.
 |
| **Develop test cases of expected outputs** | 1. Video and audio output: testing the video and audio output to ensure that the games are displayed correctly on the screen and that the sound is clear and synchronised with the gameplay.
2. Resolution and aspect ratio: testing the resolution and aspect ratio settings to ensure that the games are displayed correctly on different types of screens and that the aspect ratio is preserved.
3. Online connectivity: testing the online connectivity to ensure that the console can connect to the internet, download games, and access online features such as leaderboards and matchmaking.
4. Remote play: testing the ability to stream games from the console to other devices, such as a laptop or tablet, and testing the quality of the video and audio output during remote play.
5. Remote and/or app control: testing the ability to control the console with a remote or an app, such as turning on/off, adjusting volume, or launching specific apps or games.
6. Save and load: testing the ability to save and load games, including the ability to save to different storage options, such as cloud or local storage.
7. Sharing and streaming: testing the ability to share and stream gameplay, such as the ability to share screen, videos, or audio to different platforms or devices.
8. Virtual reality and augmented reality: testing the compatibility and the output of the games with the VR and AR headsets, ensuring that the games are displayed correctly and that the VR and AR features are working properly.
9. Game compatibility: testing the compatibility of the games with the console, ensuring that games run smoothly, and that the graphics and sound are displayed correctly.
10. User account: testing the ability to create, manage and delete user accounts, ensuring that the user can access their own saved games and settings.
 |

Discuss [non-functional requirements](https://www.youtube.com/watch?v=fc-5HJPBZMQ&t=352s) including examples of a UI or interactive media solution, including:

* branding and marketing of the solution
* minimising cognitive load and physical movement to use the interface.

In the space below explain the non-functional requirements of a UI or interactive media solution.

**Teacher note:** sample answers are provided under the ‘Explain the non-functional requirements of a UI or interactive media solution’ heading in the table below. These can be deleted when distributing to students as a resource.

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| Example | Explain the non-functional requirements of a UI or interactive media solution |
| **Branding and marketing of the solution** | **Brand consistency:** the solution should consistently reflect the brand's visual identity and messaging. This includes elements such as colour scheme, typography, imagery, and tone of voice.**Usability:** the solution should be easy to navigate, understand, and use for the target audience. This includes elements such as clear labelling, consistent design, and intuitive organisation of content.**Responsiveness:** the solution should be responsive and adaptable to different screen sizes and devices, including desktops, laptops, tablets, and smartphones.**Accessibility:** the solution should be accessible to users with disabilities, following guidelines such as WCAG (Web Content Accessibility Guidelines) and providing features like alternative text for images, keyboard navigation, and high-contrast mode.**Performance:** the solution should be designed for fast loading times, minimal latency, smooth scrolling and animations.**Security:** the solution should protect sensitive information, such as user data and payment information, with secure coding practices and encrypted data transmission.**Localisation:** the solution should be designed to handle different languages and cultures, providing the ability to translate and adapt the content to different regions.**Analytics:** the solution should have an ability to track user behaviour and engagement, provide data for optimisation and future development.**Scalability:** the solution should be able to handle a large volume of users and data and be able to adapt to future growth.**Flexibility:** the solution should be able to adapt to different use cases and be easy to customise and update. |
| **Minimising cognitive load and physical movement to use the interface** | **Minimise the number of steps required to complete a task:** by simplifying the interface and reducing the number of clicks or selections needed to accomplish a goal, the user's cognitive load is reduced.**Use clear and consistent design:** a consistent design, with clear labels and icons, can help users quickly understand the interface and the actions they need to take, reducing cognitive load.**Use visual cues:** by using visual cues such as highlighting, animations or other forms of feedback, it can help the user understand the current state of the interface and the actions that are available to them.**Provide clear instructions:** clear instructions and prompts can help users understand how to complete a task, reducing cognitive load.**Use keyboard shortcuts:** by providing keyboard shortcuts, users can accomplish tasks more quickly and efficiently, reducing physical movement.**Provide undo and redo functionality:** by allowing users to undo or redo actions, it can help them correct mistakes and reduce cognitive load.**Optimise for touch and gesture input:** by designing the interface to work well with touch and gesture input, users can interact with the interface more naturally and efficiently, reducing physical movement.**Use adaptive and personalised interfaces:** by providing an interface that adapts to the user's preferences, needs, and context, it can help reduce cognitive load and physical movement. |

Activity – in the tables below, design the functional and non-functional requirements for your chosen solution in Assessment task 3.

|  |  |
| --- | --- |
| Aspect | Specify the functional requirements of your chosen UI or interactive media solution |
| **The purpose of a system** |  |
| **Describe use cases** |  |
| **Develop test cases of inputs** |  |
| **Develop test cases of expected outputs** |  |
| **Aspect** | Specify the non-functional requirements of your chosen UI or interactive media solution. |
| **Branding and marketing of the solution** |  |
| **Minimising cognitive load and physical movement to use the interface** |  |

Students investigate and compare 2 of the following:

* [Business/Corporate website](https://www.adobe.com/au/)
* [E-Commerce website](https://www.amazon.com.au/)
* [Educational website](https://kids.nationalgeographic.com/)
* [Non-Profit Website](https://www.redcross.org.au/)

Record your answer in the space below.

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****As a class, students watch [UML Use Case Diagram Tutorial (13:23)](https://www.youtube.com/watch?v=zid-MVo7M-E).

Model and discusses the creation of a use case diagram.

Students create a use case diagram on an app of their choice with the following components:

* systems
* actors
* use cases
* relationships.

Create a diagrammatic drawing of a use case for an app in the space below.

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### Data compression

Discuss how [data compression](https://www.barracuda.com/support/glossary/data-compression#:~:text=About%20Data%20Compression-,What%20is%20Data%20Compression%3F,bits%20than%20the%20original%20representation.):

* is a process of encoding
* is a reduction of bits
* uses reference dictionaries
* ****can be categorised as lossy or lossless.

As a class watch the [Lossy versus Lossless video (9:50).](https://www.youtube.com/watch?v=X88vxU2o4f0)

Define and describe lossy compression. Answer in the space below.

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| Sample answer:Lossy compression is a data compression technique used in digital media to reduce the size of files, such as images, audio, and video. By selectively discarding or approximating certain information that is considered less important to the human perception of the content.The key characteristic of lossy compression is that some of the original data is permanently lost during the compression process, which differentiates it from lossless compression, where no data is lost. |

Define and describe lossless compression. Answer in the space below.

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| Sample answer:Lossless compression is a data compression technique used to reduce the size of digital files without any loss of data or quality. Unlike lossy compression, which sacrifices some data to achieve higher compression ratios, lossless compression algorithms aim to store and reconstruct the original data exactly as it was before compression.This means that when you decompress a file that has been compressed using a lossless method, you get an exact replica of the original data. |

[Think Pair Share](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/645#.YvWQGPfrhkE.link) on why data compression is important, considering:

* file size (storage)
* transmission speed
* audio and video compression.

### Social impacts and ethical and legal requirements

Students explore the following case studies identifying and describing the social, ethical and legal issues of:

* [Yes, you should monitor your remote workers – but not because you don’t trust them (The Guardian)](https://www.theguardian.com/business/2022/sep/25/monitor-workers-at-home-security-cybercrime)
* [Being monitored by your boss while working from home – necessary trade-off or 'stupid' surveillance? (ABC News)](https://www.abc.net.au/news/2020-10-16/work-from-home-tracking-software-monitoring/12766020)
* [Australian bosses spying on their staff using webcam, screenshots and keystroke monitoring (News.com)](https://www.news.com.au/finance/work/at-work/australian-bosses-spying-on-their-staff-using-webcam-screenshots-and-keystroke-monitoring/news-story/8182207a7681062dde11a5dae687adae)

#### Social impacts

UIs or interactive media products can have a variety of social impacts, both positive and negative. Some of the potential social impacts include:

**Increased social connectedness:** UIs and interactive media products can provide a platform for people to connect and communicate with others, regardless of their location. This can foster a sense of community and social connection among users and can be especially beneficial for individuals who may have difficulty forming social connections in person.

**Improved communication:** UIs and interactive media products can make it easier for people to communicate, share information, and collaborate with others. This can be especially useful for people with disabilities or for those who are unable to communicate verbally.

**Increased access to information:** UIs and interactive media products can provide users with easy access to information, educational resources, and news. This can be especially beneficial for people living in remote or underserved areas.

**Increased sedentary behaviour:** UIs and interactive media products can also lead to increased sedentary behaviour, as users may spend more time sitting and interacting with technology, rather than engaging in physical activities.

**Addictive behaviour:** some people may become addicted to interactive media products, such as video games, and this can lead to problems with time management, social isolation, and other negative effects.

**Privacy concerns:** UIs and interactive media products can also raise concerns about privacy, as they can collect personal data and share it with third parties. Additionally, some UIs can track the user’s behaviour and use it for targeted advertisement or other purposes that can be seen as an invasion of privacy.

**Disruption of social norms:** UIs and interactive media products can also disrupt traditional social norms, as people may spend more time interacting with technology than with other people. This can be especially concerning for children and teenagers, who may be more vulnerable to the negative effects of excessive screen time.

What are the social impacts of creating digital newspapers such as [The Guardian](https://www.theguardian.com/au), [ABC News](https://www.abc.net.au/news) or [News.com](https://www.news.com.au/)? Answer in the space below.

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| ****Sample answer:****The creation of digital newspapers has had profound social impacts, greatly enhancing access to global news while diversifying voices and perspectives.It has facilitated immediate access to information for a global audience and reduced environmental costs associated with print media. However, it has also exacerbated the digital divide and raised concerns about privacy and data security.The shift to digital media has disrupted traditional revenue models, leading to job losses in some sectors and challenges in maintaining quality journalism. Furthermore, the proliferation of online sources has created bubbles and echo chambers, and the dynamics of online comment sections can sometimes foster toxicity and misinformation.Balancing the positive aspects of accessibility and diversity with the negative implications of digital journalism remains an ongoing societal challenge. |

#### Ethics

Ethics is an important topic in designing for user experience, as designers create products that have the potential to affect people’s lives. Whether you’re designing an app, website, game or virtual reality, the quality and character of the user experience is hugely important. Additionally, designers need ethics because it is very difficult to ensure good behaviour through any other mechanism. Law can never anticipate every possible issue in designing information technology systems and products, and law enforcement can’t oversee every single detail of every designer’s job.

In the space below, define ethics.

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| ****Sample answer:****Ethics are moral principles that govern a person's behaviour or the conducting of an activity.Ethics reflect on human beings and their interaction with nature, with other humans, on freedom, responsibility and justice. |

The ethical issues of UIs or interactive media products may include:

**Privacy:** UIs and interactive media products should respect users' privacy and protect their personal information from unauthorised access or misuse. This includes obtaining informed consent from users before collecting and using their data and providing clear and transparent privacy policies.

**Transparency:** UIs and interactive media products should be transparent about their data collection and use, and provide users with control over their personal data. This includes providing users with the ability to access, correct, and delete their data, and allowing them to opt-out of data collection and sharing.

**Fairness:** UIs and interactive media products should not discriminate against or disadvantage any group of users and should be designed to be inclusive and accessible to people with disabilities.

**Responsibility:** UIs and interactive media products should be designed and used responsibly, considering the potential negative impacts they may have on individuals and society as a whole. This includes limiting the amount of time spent using interactive media and designing products that do not exploit or manipulate users.

**Respect for autonomy:** UIs and interactive media products should respect users' autonomy and provide them with the ability to make informed choices about their use. This includes providing users with clear information about the potential risks and benefits of using a product and allowing them to control their level of engagement with the product.

**Avoiding addiction:** UIs and interactive media products should be designed in a way that minimises the risk of addiction, by providing clear information about the potential risks of excessive use and providing tools to help users manage their use.

**Avoiding manipulation**: UIs and interactive media products should be designed to avoid manipulation of users, for example using persuasive design techniques or psychological triggers.

**Respect for human dignity:** UIs and interactive media products should respect human dignity, and avoid promoting or facilitating harmful or illegal activities, such as discrimination, hate speech or cyberbullying.

What are some ethical issues when designing the user experience of digital newspapers such as [The Guardian](https://www.theguardian.com/au), [ABC News](https://www.abc.net.au/news) or [News.com](https://www.news.com.au/)? Answer in the space below.

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#### Legality

What would you consider to be a legal responsibility associated with user interfaces and interactive media products when examining the *Anti-Discrimination Act*? Answer in the space below.

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What would you consider to be a legal responsibility associated with user interfaces and interactive media products when examining the *Privacy Act*? Answer in the space below.

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Investigate what other laws are in place that could apply to the social and ethical issues in user interface and interactive media product development.

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[Think Pair Share](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/645#.YvWQGPfrhkE.link) your ideas with the class.

### Perspectives of diverse groups

Diverse groups have different perspectives on the design for user experience. Diverse groups include:

* Aboriginal and Torres Strait Islander peoples
* culturally diverse people
* linguistically diverse people
* people of different ages
* people of different genders
* people with disability.

[Brainstorm](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/542#.ZC4skSv0RLg.link) as many ways that user interfaces and interactive media products can help diverse groups in the space below (for example, subtitles for people who are d/Deaf or hard of hearing).

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Examine and discuss the WCAG standard utilising the [Centre for Accessibility Australia](https://www.accessibility.org.au/) website.

As a class, students watch the [Centre for Accessibility video](https://vimeo.com/273843252?embedded=true&source=vimeo_logo&owner=11711030) (2:40).

Explore the Centre for Accessibility Australia website and answer the following.

What is the WCAG standard?

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| ****Sample answer:****The Web Content Accessibility Guidelines (WCAG) is a set of guidelines and standards for making web content more accessible to people with disabilities.The WCAG standard is developed and maintained by the Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C).The WCAG standard provides a framework for evaluating the accessibility of web content and includes guidelines for designing and developing web pages, applications, and multimedia that can be used by people with a wide range of abilities and disabilities. |

What are the 4 main principles of [(P.O.U.R.)](https://www.w3.org/WAI/standards-guidelines/wcag/glance/)?

|  |
| --- |
| Sample answer:The WCAG standard is organised into 4 main principles:* Perceivable
* Operable
* Understandable
* Robust

Each principle is then divided into a number of guidelines and success criteria that can be used to evaluate the accessibility of web content.The WCAG standard is widely used as the basis for accessibility regulations and laws around the world. |

List 10 ways UI and UX designers can make a website accessible, utilising the WCAG in the space provided below.

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| ****Sample answers:****1. Providing alternative text for images, videos, and other non-text content, so that people using assistive technology can understand the content.
2. Designing user interfaces that are easy to operate using only a keyboard, so that people who cannot use a mouse or other pointing device can navigate the website.
3. Using clear and simple language, consistent layout, and logical structure to make the website easy to understand for everyone, including people with cognitive or learning disabilities.
4. Providing captions or other alternative methods for conveying information in videos and audio content.
5. Creating pages with a high contrast ratio between text and background colours to make the website more legible for people with visual impairments.
6. Designing forms and other interactive elements that are easy to use and understand for everyone, including people with motor or cognitive impairments.
7. Using ARIA (Accessible Rich Internet Applications) attributes to provide additional information about the purpose and structure of web content to assistive technology.
8. Testing the website with a variety of assistive technology, such as screen readers, to ensure that it is accessible to people with different abilities and disabilities.
9. Providing an option to increase the font size, line-height, and spacing to make websites more legible for people with low vision.
10. Providing a way to skip repetitive blocks of content, such as navigation, so that users can quickly jump to the main content.
 |

What [policies](https://www.accessibility.org.au/policy/) relate to digital access in Australia?

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| ****Sample answers:****1. *The Disability Discrimination Act* *1992* (DDA) which makes it unlawful to discriminate against people with disabilities in areas of public life, including in the provision of goods, services and facilities.
2. The Australian Government Web Guidelines (AGWG) which provide guidance on how to make government websites and web content accessible to people with disabilities.
3. The *Broadcasting Services Act 1992* (BSA) which includes accessibility requirements for television and radio services.
4. The Web Content Accessibility Guidelines (WCAG) 2.0 which is a set of guidelines for making web content more accessible to people with disabilities.
5. The National Disability Strategy 2010-2020 which aims to improve the lives of people with disabilities and increase their participation in the community.
6. The *Australian Human Rights Commission Act 1986* which aims to protect human rights, including the rights of people with disabilities.
7. The Disability (Access to Premises – Buildings) Standards 2010 which provides guidelines for building accessibility for people with disabilities.
8. The *Telecommunications (Consumer Protection and Service Standards) Act 1999* which requires telecommunications providers to make their services accessible to people with disabilities.
9. The Commonwealth Disability Strategy which provides a framework for government agencies to make their services and policies more accessible to people with disabilities.
10. The National Disability Insurance Scheme (NDIS) which provides funding for support and services for people with disabilities, including assistive technology and home modifications to help them live more independently.
 |

There are permissions and protocols for capturing images, voice or video of Aboriginal peoples who are deceased.

Facilitate a class discussion on the use of Aboriginal imagery specifically regarding [depicting deceased persons.](https://www.sbs.com.au/nitv/article/indigenous-cultural-protocols-what-the-media-needs-to-do-when-depicting-deceased-persons/97xq2otnt)

Students review the [ACTCOSS Good Practice Guide: Aboriginal and/or Torres Strait 'warning'](https://actcoss.org.au/publication/gulanga-good-practice-guides/) and using their own research, answer the following.

What restrictions are in place for the use of images or audio of a deceased Aboriginal person?

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| ****Sample answer:****Australia is home to some 200 Indigenous nations and within these nation groups there are varying cultural protocols. The Australian Government agencies have adopted protocols and guidelines when working in Indigenous communities to respect and honour the Aboriginal and Torres Strait Islander cultures, unique to Australia.The Indigenous cultural protocols guide processes when involving Indigenous affairs; from avoiding exposure of sacred sites to speaking to an appropriate representative of a community. It also guides the conduct of reporting on deceased persons in their respected communities. |

What are some common bereavement practices in Aboriginal communities in relation to image and audio use?

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| ****Sample answer:****In the case of the deceased members, protocols for mourning may vary for different clan groups and different individuals. However, it’s common practice that when there is a member of the community that has died, the person’s name is changed due to cultural beliefs and the images of that person are suppressed. This may be just for a period of time, some cases could vary between 6–12 months but liaising with the community is paramount. |

What warning/advice should be placed on media, apps and websites to alert Aboriginal peoples to the depiction of deceased persons?

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| ****Sample answer:****Journalists and documentary makers should be aware that images and voices of long-deceased persons, for example, in archival footage and photographs, may cause distress to Aboriginal and Torres Strait Islander peoples.The cultural protocol includes a warning that the ABC uses at the beginning of programs, on its website and radio, to alert Aboriginal and Torres Strait Islander viewers, listeners and readers:WARNING: Aboriginal and Torres Strait Islander viewers are warned that the following program may contain images and voices of deceased persons. |

### End User License Agreements and Terms of Service

As a class, discuss End User License Agreements (EULA) and Terms of Service (TOS). Unpack and describe the implications on designing user interface and interactive multimedia systems.

An End User License Agreements (EULA) is an agreement between the software licensor and the end user.

* The licensor is the entity who sells the software.
* The end user is the customer who uses the software.

Watch [End User License Agreements](https://www.youtube.com/watch?v=f8vy-KmHP68) EULA (1:17) and complete the following questions:

Why does software need a EULA?

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| Sample answer:Software needs a EULA primarily for legal and contractual reasons. A EULA sets clear terms and conditions for how the software can be used, specifying user rights, restrictions, and responsibilities. It helps protect the software developer's intellectual property rights, defines liability limitations, and ensures that the software is used in compliance with copyright laws and licensing agreements.Additionally, a EULA serves as a legal contract between the developer and the end user, outlining the obligations and expectations of both parties. It helps prevent software piracy, unauthorised distribution, and misuse while providing a mechanism for dispute resolution in case of disagreements. |

How do users accept a EULA?

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| ****Sample answer:**** Users typically accept a EULA by performing a specific action as outlined by the software or service provider. This often involves selecting the I Agree or Accept button, checking a checkbox, or actively acknowledging the agreement's terms during software installation, registration, or the first use of an online service. By taking these actions, users indicate their consent and agreement to abide by the terms and conditions set forth in the EULA. It's important for users to carefully review the EULA before accepting it, as it represents a legally binding contract that governs their use of the software or service, and any violations of its terms may have legal consequences. |

Read about [Terms of service](https://odinlaw.com/the-differences-between-a-eula-tos-and-sla/).

What is a TOS?

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| ****Sample answer:**** TOS refers to a legal agreement between a service provider and its users, outlining the rules, guidelines, and conditions that govern the use of a particular service or platform. TOS documents typically cover a wide range of topics, including user responsibilities, acceptable behaviour, privacy policies, intellectual property rights, disclaimers of liability, dispute resolution procedures, and more.These agreements are a fundamental part of online interactions, ensuring that both the service provider and users understand their rights and obligations when using a website, app, or digital service. By accessing or using the service, users are generally considered to have agreed to abide by the terms and conditions outlined in the TOS. |

What are the differences between EULA and TOS?

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| --- |
| Sample answer:EULA and TOS are both legal agreements used in the digital realm, but they serve distinct purposes.A EULA primarily governs the use of software or applications, outlining user rights, restrictions and licensing terms related to the software's installation and usage. It addresses issues like intellectual property rights and software-specific matters. In contrast, a TOS is a broader agreement used for online platforms, websites, and services, encompassing user behaviour, privacy policies, content sharing guidelines, and often the rules and expectations for community or social features. While both documents establish legally binding terms and conditions, a EULA focuses on software-specific aspects, while a TOS addresses the usage of digital services or platforms more broadly. |

Facilitate a class discussion on the implications of EULA and TOS, specifically on data security and privacy including the use of cookies.

### Cookies

As a class, students watch [What are cookies and how do they work? (5:07)](https://www.youtube.com/watch?v=rdVPflECed8).

Cookies are small pieces of data, typically in the form of text files, that are stored on a user's device when they visit a website. These files serve several functions in the digital realm.

First, they help websites remember user preferences and settings, allowing for a personalised and smoother browsing experience. Second, cookies enable websites to track user behaviour, collecting information such as pages visited, session data, and interactions with site elements. This data is often used for analytics, helping website owners understand user engagement and improve their online offerings.

Additionally, cookies are instrumental in tasks like maintaining user sessions, providing authentication, and supporting features like shopping carts in e-commerce. However, their use has raised privacy concerns, leading to regulations and user consent mechanisms aimed at safeguarding individuals' data and online privacy.

Answer the following questions in the space provided.

What data is being collected?

|  |
| --- |
| Sample answer:Cookies are small text files placed on a user's device when they visit a website and they collect various types of data.This typically includes information such as user preferences, session identifiers, and authentication tokens to improve website functionality.Additionally, cookies can track user behaviour including pages visited, duration of visits, and interactions with site elements. Some cookies are used for advertising and tracking purposes, collecting data on user interests and behaviour across websites to deliver targeted ads. |

How is the data being collected?

|  |
| --- |
| Sample answer:Cookie data is collected through a multi-step process when a user interacts with a website. When a user visits a website, the web server sends a small text file (the cookie) to the user's device, where it is stored in the browser's cookie storage.This file contains information, often in the form of key-value pairs, which can include user preferences, session identifiers, or tracking data. During subsequent visits to the same website, the browser automatically sends the stored cookies back to the web server. The server can then read and process this data to personalise the user's experience, maintain their session, or track their behaviour on the site. While cookies themselves typically do not contain personally identifiable information, they can be used to collect and transmit user data when combined with other tracking technologies, potentially raising privacy concerns and leading to the implementation of data protection measures and user consent mechanisms. |

Why is the data being collected?

|  |
| --- |
| ****Sample answer:****Cookies collect data for various purposes, primarily aimed at improving user experiences and providing website owners with valuable information, for example:* website functionality
* session management
* tracking and analysis
* advertising and marketing
* security
* e-commerce.
 |

How will it be shared to third parties?

|  |
| --- |
| Sample answer:While cookies can be essential for web functionality, they also raise privacy concerns, as they can potentially gather and transmit personal information if not managed or consented to properly. Modern web practices often involve providing users with transparency and control over cookie usage to respect their privacy preferences.Cookie data may be shared with third parties when a website or online service uses tracking cookies to collect user information and then shares that data with advertising networks, analytics providers, or other external entities for purposes such as targeted advertising or analytics insights. |

****Students break into small groups, then explore and analyse one side of the debate on cookies.

Specifically using a real-world example of a EULA, students should consider:

* privacy
* security
* data use/storage
* user perception
* company reputation.

Students share their responses and collate the key points for, or against, as a class.

|  |  |
| --- | --- |
| Arguments for using cookies | Arguments against using cookies |
| * Privacy
* Security
* Data use/storage
* User perception
* Company reputation
 | * Privacy
* Security
* Data use/storage
* User perception
* Company reputation
 |

# Researching and planning

## Real world problems or needs

When designing solutions to real world problems or needs, we need to break down the problem into manageable parts and examine who the users are and consider human-centred design in our solution.

What is a user (direct or indirect)?

|  |
| --- |
| ****Sample answer:****A direct user is someone who actively engages with a digital platform or service. This person interacts with the platform by using its features, creating an account, making purchases, posting content, or providing personal information directly to the service. For example, when you log into a social media platform, you are a direct user of that platform.An indirect user is someone whose data or information is collected or processed by a digital platform or service, even if they are not actively engaging with it. This can happen when a platform collects data about individuals who may not have registered or used the service directly but are still impacted by its data practices. For instance, if a social media platform tracks and collects data about the online behaviour of individuals who visit its website, even if they do not have accounts, those visitors are considered indirect users. |

What is human-centred design?

|  |
| --- |
| ****Sample answer:****Human-centered design (HCD) is an approach to problem-solving and innovation that places the needs, preferences, and behaviours of people at the forefront of the design process. It emphasises empathy and a deep understanding of users' perspectives, challenges, and aspirations.HCD involves iterative phases of research, ideation, prototyping, and testing, with the aim of creating products, services, or experiences that are user-friendly, intuitive, and ultimately more effective. By involving users and stakeholders throughout the design journey, HCD seeks to address real-world problems in ways that are meaningful and responsive to the people who will use and benefit from the final solution, resulting in more human-centered and user-driven outcomes. |

Examine the website [UX vs UI: Design Stages, Participants, Roles, and Skills](https://www.altexsoft.com/blog/uxdesign/ux-vs-ui-design-stages-participants-roles-and-skills/) and look at the trends in UX and [stages of development](https://www.altexsoft.com/blog/uxdesign/ux-vs-ui-design-stages-participants-roles-and-skills/) in creating a user interface.

As a class watch [What is Human-Centred Design? (10:22)](https://www.youtube.com/watch?v=KkUor_NTuDA) and while watching the teacher may pause the video to facilitate students to answer the following questions.

Describe why you need to consider using human-centred design rather than user-centred design? (0:15)

|  |
| --- |
| ****Sample answer:****When we use words that make people sound like another component of the system, like the word ‘user’ we are dehumanising them. We may have zero empathy for users.Designing with the concept of real humans and giving them names them makes us more empathetic. |

Identify the 3 components of direct engagement of users? (1:26)

|  |
| --- |
| Sample answer:* observation
* research
* evaluation
 |

List 2 ways of researching users. (1:38)

|  |
| --- |
| Sample answer:* questionnaires
* interviews
 |

Describe the term ‘contexts of use’. (2:18)

|  |
| --- |
| Sample answer:The contexts of use are everything about how systems are actually employed in the real world. |

Compare the needs of the users in a café versus a supermarket. (2:30–3:50)

|  |
| --- |
| ****Sample answer:****The equipment may be virtually identical. The software might be very similar. But the actual use of these systems could not be more different.In a supermarket, you have one customer at a time, the person that you're actually doing the checking out for. And there is one user at a time. The user is the checkout operator. And that person might have to go through a hundred or more items from somebody's weekly shopping. But the important factors are that it is just one customer and a lot of items.In a cafe you have many people sharing the one point-of-sale system, and they need to be able to switch between customers very quickly, and they need to switch between users very quickly, too.  |

List the 4 key components of user-centred design. (4:54)

|  |
| --- |
| Sample answer:* research contexts of use
* specify the user requirements
* produce some design solutions
* evaluate those solutions against the initial requirements
 |

Why is usability testing not enough to improve processes and systems? (5:54–7:17)

|  |
| --- |
| ****Sample answer:****Typically with usability testing, you're actually doing nothing to improve the usability of your process. You are still creating bad designs. And just filtering them out is going to be wasteful in terms of the amount of effort. Usability evaluations are a very important tool. |

Describe the benefit of having a multidisciplinary team. (8:30)

|  |
| --- |
| ****Sample answer:****Multidisciplinary teams have people who are not focused strictly on technology. So, you might well improve empathy that way. You might certainly get better problem solving because having people with different kinds of backgrounds or expertise is a much better way of solving problems than a lot of people who are used to thinking about issues in, for example, a computer-oriented fashion. |

Describe why prototypes are important? (9:05)

|  |
| --- |
| ****Sample answer:****We need to produce prototypes as early as possible. We need to produce prototypes, perhaps low-fidelity prototypes or paper prototypes, and just make sure that our ideas are sound. |

****Students break down one of the following websites identifying the users, requirements and evaluating the landing page with human-centred design theory:

* [Amazon](https://www.amazon.com.au/)
* [WWF](https://www.wwf.org.au/)
* [Ticketek](https://premier.ticketek.com.au/)
* [NSW Ambulance](https://www.ambulance.nsw.gov.au/).

In the table below, identify and justify human-centred design theory on one of the mentioned websites.

|  |  |
| --- | --- |
| Component | Identify and justify human-centred design theory |
| **Users** |  |
| **Requirements** |  |
| **Website landing page** |  |

## Principles of design

[Think Pair Share](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/645#.YvWQGPfrhkE.link) what you believe good design is.

Watch [Understanding the Principles of Design (9:55)](https://www.youtube.com/watch?v=UmHMVU6dceA).

Students create a digital poster incorporating design principles on [Canva](https://www.canva.com/en_au/).

Class discussion on the unique design requirements of digital design including:

* static versus dynamic
* data types for example .jpeg versus .gif, Vector versus Bitmap
* scalability
* accessibility
* typography.

## Evaluating UI and interactive media

Examine different ways of evaluating UI and interactive media including:

* [heuristic evaluation](https://www.nngroup.com/articles/ten-usability-heuristics/)
* think aloud evaluation
* pluralistic walkthrough evaluation.

Explore heuristic evaluation through the [NNGroup website](https://www.nngroup.com/articles/ten-usability-heuristics/) and watch the following videos.

[Heuristic Evaluation playlist](https://www.youtube.com/playlist?list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I) [10 videos – YouTube]

* [Usability Heuristic 1: Visibility of System Status (2:36)](https://www.youtube.com/watch?v=cTtc90jCULU&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I)
* [Usability Heuristic 2: Match Between the System and the Real World (3:08)](https://www.youtube.com/watch?v=0TAt9Pln51g&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=2)
* [Usability Heuristic 3: User Control & Freedom (2:15)](https://www.youtube.com/watch?v=MXuk-fdbr0A&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=3)
* [Usability Heuristic 4: Consistency and Standards (2:37)](https://www.youtube.com/watch?v=Ibndy9KLOSQ&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=4)
* [Usability Heuristic 5: Error Prevention (2:52)](https://www.youtube.com/watch?v=imS9s1DUY-I&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=5)
* [Usability Heuristic 6: Recognition vs. Recall in User Interfaces (2:48)](https://www.youtube.com/watch?v=6glQPp6q4Jc&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=6)
* [Usability Heuristic 7: Flexibility and Efficiency of Use (2:54)](https://www.youtube.com/watch?v=LoTdRTBB8BQ&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=7)
* [Usability Heuristic 8: Aesthetic and Minimalist Design (1:57)](https://www.youtube.com/watch?v=ZgbRmeWDgd0&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=8)
* [Usability Heuristic 9: Help Users Recognize, Diagnose and Recover from Errors (2:19)](https://www.youtube.com/watch?v=cCun-ReLTFI&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=9)
* [Usability Heuristic 10: Help & Documentation (2:46)](https://www.youtube.com/watch?v=iIQVRzatb50&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=10)

Utilising the usability heuristics, evaluate one of the following websites in the table provided:

* [Amazon](https://www.amazon.com.au/)
* [WWF](https://www.wwf.org.au/)
* [Ticketek](https://premier.ticketek.com.au/)
* NSW [Ambulance](https://www.ambulance.nsw.gov.au/)

The evaluation table will include:

|  |  |
| --- | --- |
| Task | Answer |
| List each of the 10 heuristics |  |
| Outline suitability for the users  |  |
| Examine areas of modification/improvement |  |
| Evaluate how could it be used for other purposes/applications |  |

## Evolution of UI and interactive media

Examine how UIs or interactive media have evolved in response to people's needs and opportunities.

Explain the history of user interfaces, such as punch cards, text, graphical user interfaces (GUI), to gestures and speech.

**Punch Cards**

Watch [The Rise and Fall of The Punched Card (10:58)](https://www.youtube.com/watch?v=spL_pJOIqKA).

**Text-Based User Interface (TUI)**

Students investigate and compare the first text-based user interfaces with today's command line programming user interfaces. Examples of the first text-based user interfaces include [DOS](https://en.wikipedia.org/wiki/DOS) and [Command-Line Interface (CLI)](https://en.wikipedia.org/wiki/Command-line_interface).

**Graphical User Interface (GUI)**

Watch the [evolution of the GUI video (12:58)](https://www.youtube.com/watch?v=XIGSJshYb90).

Students can examine a range of interfaces including:

* Xerox PARC
* Apple Lisa
* SGI 1000 series A
* Microsoft Windows (16-bit versions).

Students research and describe one of the following early GUI devices covering its production, development and uses.

|  |
| --- |
|  |

As a class facilitate a discussion on modern interfaces such as:

* Controllers with haptic feedback
* Gesture and speech control
* VR headsets
* Simulation hardware.

Explain the terms ‘input’ and ‘output’.

|  |
| --- |
| Sample answer:Input refers to the data or information that is provided to a computer or system for processing. It encompasses various forms of data entry, including user interactions through devices like keyboards and mice, sensor data from the physical world, information retrieved from files or networks, and software-generated data.Output represents the results or information produced by the computer or system as a response to processing the input data. Output can take the form of user interface elements, printed documents, files, network communication, or control signals, depending on the nature of the task, ultimately conveying the system's processed information, outcomes, or actions to users or other devices. |

Discuss intelligent interfaces and virtual assistants.

|  |
| --- |
| Sample answer:Intelligent interfaces and virtual assistants are cutting-edge technologies that leverage artificial intelligence to transform human-computer interactions. Intelligent interfaces enhance user experiences by incorporating AI to understand natural language, personalise interactions, and adapt to context, ultimately offering more efficient and user-friendly interactions.Virtual assistants, a specific type of intelligent interface, provide conversational and task-oriented assistance through voice commands and responses, automating tasks, managing smart home devices, retrieving information, and promoting accessibility and inclusivity.Together, these technologies are reshaping how we interact with computers and digital services, making daily tasks more convenient and accessible while opening up new possibilities for productivity and engagement in a wide range of applications. |

Students create a table with the headings input and output and research different hardware, software and technologies that apply to those terms.

**Teacher note:** sample answers are provided under the ‘Input’ and ‘Output’ headings in the table below. These can be deleted when distributing to students as a resource.

|  |  |  |
| --- | --- | --- |
|  | Input | Output |
| Hardware | Keyboard: a device used to input text and commands by pressing keys.Mouse: a device used to control the movement of a cursor on a screen and select items on a computer.Touchpad: a device used to control the movement of a cursor on a screen and select items on a computer, similar to a mouse but instead of a ball it uses finger touch.Touch screen: a device that allows users to interact with a computer or other electronic device by touching the screen.Scanner: a device that captures images or documents and converts them into digital data.Digital camera: a device that captures still or video images and stores them as digital data.Microphone: a device that converts sound into digital data.Game controller: a device that allows users to interact with video games and other interactive applications.Barcode reader: a device that reads barcodes and converts them into digital data.Biometric device: a device that captures biometric data, such as fingerprints, facial recognition or iris recognition, and converts it into digital data. | Monitor: a device that displays visual output from a computer or other electronic device.Printer: a device that produces hard copies of digital documents, such as text, images, or graphics.Projector: a device that projects visual output from a computer or other electronic device onto a screen or wall.Speaker: a device that produces audio output from a computer or other electronic device.Headphones: a device that produces audio output from a computer or other electronic device, while isolating the sound from the surrounding environment.Braille displays: a device that converts digital text into braille characters, which can be read by visually impaired individuals.Plotter: a device that produces large format printed output, such as architectural drawings or engineering blueprints.3D printer: a device that produces physical objects from 3D models, such as prototypes or final products.VR headset: a device that allows users to view and interact with virtual reality environments.Smartwatch: a device that displays output from a computer or other electronic device, such as notifications, text messages, and fitness data. |
| Software | Text editors: software used to input and edit text, such as Microsoft Word or Google Docs.Spreadsheets: software used to input and manipulate data in a tabular format, such as Microsoft Excel or Google Sheets.Database management software: software used to input, store, and retrieve data in a database, such as Microsoft Access or MySQL.Graphic design software: software used to create and edit images, such as Adobe Photoshop or GIMP.Audio and video editing software: software used to create, edit, and manipulate audio and video files, such as Adobe Audition or Final Cut Pro.3D modelling software: software used to create 3D models and animations, such as Autodesk Maya or Blender.Voice recognition software: software that allows users to input commands and data using voice, such as Siri or Alexa.OCR software: software that converts images of text into editable text, such as Adobe Acrobat.VR/AR software: software that allows users to interact with virtual or augmented reality environments, such as Unity or Unreal Engine.Game development software: software used to develop video games and other interactive applications, such as Unity or Unreal Engine. | Web browsers: software used to display web pages and other digital content on the internet.Office software: software used to create and edit documents, spreadsheets, and presentations, such as Microsoft Office or Google Docs.Graphic design software: software used to create and edit images, such as Adobe Photoshop or GIMP.Audio and video editing software: software used to create, edit, and manipulate audio and video files, such as Adobe Audition or Final Cut Pro.3D modelling software: software used to create 3D models and animations, such as Autodesk Maya or Blender.Game development software: software used to develop video games and other interactive applications, such as Unity or Unreal Engine.Video player software: software that plays video files, such as VLC player or QuickTime playerE-book reader software: software that reads digital books, such as Kindle or Adobe Digital Editions.Presentation software: software that allows to create and display presentations, such as PowerPoint or Prezi.Virtualisation software: software that allows multiple operating systems to run on the same computer, such as VMware or VirtualBox. |
| Technology | Optical character recognition (OCR): technology that converts images of text into editable text.Voice recognition: technology that allows users to input commands and data using voice.Handwriting recognition: technology that converts handwriting into digital text.Natural language processing (NLP): technology that allows computers to understand human language.Virtual reality (VR): technology that creates immersive virtual environments for users to interact with.Augmented reality (AR): technology that overlays digital information on the real world.Touch screen technology: technology that allows users to interact with a computer or other electronic device by touching the screen. | High-definition (HD) display: technology that provides a clearer, more detailed display of visual output.Virtual reality (VR): technology that creates immersive virtual environments for users to interact with.Augmented reality (AR): technology that overlays digital information on the real world.3D printing: technology that produces physical objects from 3D models.Speech synthesis: technology that converts text into spoken words.Text-to-speech: technology that converts text into spoken words.Braille translation: technology that converts text into braille characters.Print-to-braille: technology that converts digital documents into braille for visually impaired |

Class discussion on communication without speaking (Augmentative and alternative communication) covering:

* text messages
* social media
* gestures
* speech generation
* drawing
* miming.

Students attempt to have a short conversation with a peer using no tech or low-tech.

Explain the impact Alexa, Siri and Google smart interfaces have had on people’s lives.

|  |
| --- |
| Sample answer:Alexa, Siri, and Google smart interfaces have had a profound impact on people's lives by introducing unprecedented convenience and accessibility. These virtual assistants, powered by artificial intelligence, have seamlessly integrated into daily routines, offering hands-free, voice-activated solutions for tasks ranging from setting reminders and answering questions to controlling smart home devices and providing personalised recommendations.They have revolutionised how we interact with technology, making information and services more accessible and intuitive. Their influence extends beyond convenience, impacting how we manage our homes, access information, and communicate, ultimately shaping the way we navigate the digital world and enhancing our overall productivity and efficiency. |

What do the terms ‘home automation’ and ‘routines’ mean?

|  |
| --- |
| ****Sample answer:****‘Home automation’ refers to the use of smart devices and technology to automate and control various functions and tasks within a home environment. These tasks can include managing lighting, thermostats, security systems, entertainment systems, and more, often through centralised control systems or mobile apps, making it easier for homeowners to customise and optimise their living spaces for convenience, energy efficiency, and security.‘Routines’ in this context refer to predefined sequences of actions or tasks that can be triggered automatically or by user command, allowing for the automated execution of specific functions within a home automation system. For example, a morning routine might adjust the thermostat, turn on lights, and provide a weather update with a single voice command or schedule. |

Augmentative and Alternative Communication (AAC) is a set of tools, strategies, and systems designed to assist individuals who have difficulty speaking or are nonverbal in expressing themselves effectively. AAC can be particularly helpful for individuals with conditions such as autism, cerebral palsy, ALS (Amyotrophic Lateral Sclerosis), stroke, or other speech and language disorders.

How does augmentative and alternative communication assist those who can or have trouble speaking?

|  |
| --- |
| Sample answer:AAC systems, which encompass communication boards, devices, and software applications, enable users to convey their thoughts, needs, and emotions effectively. By utilising symbols, pictures, text, or speech output, AAC empowers individuals with speech and language disorders, autism, or conditions like ALS to engage in conversations, participate in education and work and navigate daily life. Customisable and adaptable AAC systems cater to individual communication preferences, fostering independence, inclusion, and improved quality of life for those who face speech challenges. |

Teacher-led discussion and modelling of IPO diagrams: teacher outlines the IPO for online shopping and students complete the diagram individually.

|  |  |  |
| --- | --- | --- |
| Input | Process | Output |
| * User search criteria
* Select product
* Add to cart
* Checkout
* Payment method
 | * Run query on search criteria
* Retrieve product results
* Filter and sort based on user preferences
* Add product to cart
* Calculate total cost
* Process transaction
* Generate invoice/receipt
 | * Search results
* Product information page
* Updated shopping cart
* Total cost
* Printed receipt/invoice
 |

Designing with disabilities in mind involves creating content and interfaces that are perceivable, operable, understandable and robust. This approach enables a diverse range of users to access and interact with digital content, services, and physical environments equitably, promoting universal access and usability for all.

As a class, investigate the W3 organisation’s [introduction to web accessibility](https://www.w3.org/WAI/fundamentals/accessibility-intro/) and answer the following questions.

Explain what disabilities should be considered when designing for accessibility?

|  |
| --- |
| ****Sample answer:****When designing for accessibility, it's essential to consider a range of disabilities to ensure inclusivity. These include visual impairments (such as blindness or low vision), hearing impairments (including deafness or hard of hearing), motor impairments (like limited mobility or dexterity), cognitive impairments (such as learning disabilities or memory issues) and speech impairments. |

Designing with high accessibility standards goes beyond assisting individuals with disabilities, it also benefits a broader spectrum of users.

Describe other groups of people who are assisted by high accessibility design.

|  |
| --- |
| ****Sample answer:****By prioritising accessibility, design becomes more user-friendly, inclusive, and accommodating, ensuring that a diverse range of people can access and engage with digital content and physical spaces effectively.This includes the elderly, who may experience age-related sensory and motor changes; individuals with temporary impairments, such as a broken arm or temporary illness; non-English language speakers, who rely on clear and straightforward design for comprehension; users in challenging environments, like bright sunlight or noisy surroundings; those with varying levels of digital literacy; and individuals with diverse learning styles who benefit from accessible content and interfaces. |

Describe ways to evaluate web accessibility.

|  |
| --- |
| Sample answer:Evaluating web accessibility involves assessing a website's compliance with established accessibility standards and guidelines, such as the Web Content Accessibility Guidelines (WCAG).It can be done through various methods, including automated tools that scan for common accessibility issues, manual testing by individuals with disabilities to evaluate real-world user experiences, and expert audits to identify complex or nuanced accessibility barriers.Usability testing with diverse user groups is also crucial to gauge the website's effectiveness in accommodating users with different disabilities. Regular and ongoing evaluation is essential, as web content is dynamic, and changes or updates can introduce new accessibility challenges.  |

Watch [Evaluating web accessibility (2:06)](https://www.youtube.com/watch?v=C4GIqWeywiI&t=1s).

Students [Think Pair Share](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/645#.YvWQGPfrhkE.link) what they believe cyber safety is.

Teacher-led discussion on security of data and cyber safety.

As a class watch [Safe Web Surfing (5:01)](https://www.youtube.com/watch?v=yrln8nyVBLU).

Students investigate the following cyber safety pages:

* [Avoiding scams](https://www.digitalcitizenship.nsw.edu.au/articles/avoiding-scams)
* [Privacy settings](https://www.digitalcitizenship.nsw.edu.au/articles/controlling-your-privacy-settings-in-social-media)
* [Leaving a digital footprint](https://www.digitalcitizenship.nsw.edu.au/articles/leaving-a-digital-footprint).

Students research and answer the following questions.

Describe the privacy risks that new technologies present, and how do you decide if they're worth it?

|  |
| --- |
|  |

Describe how can you protect your privacy when you're online?

|  |
| --- |
|  |

Discuss at what age people should be allowed to use social media? Why?

|  |
| --- |
|  |

## Design and author a data dashboard with visualised data

Teacher gives an overview of Microsoft Excel and its main purposes for personal and business use including:

* data entry and storage
* accounting and budgeting
* data analysis
* reporting and visualisation of data
* forecasting.

Class discussion on prior knowledge of Microsoft Excel attributes and features and basic functions and students can review the [Microsoft Excel tutorial page](https://support.microsoft.com/en-us/office/basic-tasks-in-excel-dc775dd1-fa52-430f-9c3c-d998d1735fca) if required.

Teacher-led discussion on quality data and data collection tools and social and ethical considerations.

As a class, students watch [What is Good Data? (2:58)](https://www.youtube.com/watch?v=Qgwh9FNualc) and [Choosing Your Data Collection Methods (5:16)](https://www.youtube.com/watch?v=q17s84ADGfA).

****Students work in small groups to plan and create a data collection tool utilising a closed question.

Students evaluate their collection tools, answering the following questions.

Is my collection tool easy to navigate?

|  |
| --- |
|  |

Are the questions simple to understand?

|  |
| --- |
|  |

Are my questions neutral or do they prompt a specific answer?

|  |
| --- |
|  |

Are questions clear and do they ask just one thing?

|  |
| --- |
|  |

Are all my questions different or am I getting redundant or conflicting data?

|  |
| --- |
|  |

Are my set answers appropriate to all or should I be adding options including ‘Other’ or ‘Prefer not to say’?

|  |
| --- |
|  |

What privacy and cyber security issues should I consider?

|  |
| --- |
|  |

### Validation of data

Validation of data is the process of ensuring that data is accurate, complete, and consistent, and conforms to a set of predefined rules and constraints. It is a process of checking data for errors and inconsistencies and ensuring that it is in the correct format and meets certain criteria before it is stored or processed.

There are several types of data validation:

**Syntax validation:** checks that data is in the correct format, such as a phone number being in the correct format (xxx-xxx-xxxx).

**Range validation:** checks that data falls within a specific range, such as a date of birth being within a certain range of years.

**Domain validation:** checks that data conforms to a specific set of predefined values, such as a field that only accepts ‘yes’ or ‘no’ as valid responses.

**Business rule validation:** checks that data conforms to a set of business rules, such as a credit card number being a valid number.

**Cross-field validation:** checks that data is consistent across multiple fields, such as a post codes being consistent with the state or country field.

**Database validation:** checks that data is consistent with the data in a database, such as checking that a user-entered email address is not already in use.

### Using Microsoft Excel

Teacher demonstration modelling Excel functions examining importing, filtering and sorting data.

Students [download a sample data set](https://www.contextures.com/xlsampledata01.html#data).

Class discusses why and how data can be sorted and filtered to create useful information.

Teacher leads students through importing, filtering and sorting data as well as the use of formulas, [aggregate](https://support.microsoft.com/en-us/office/aggregate-function-43b9278e-6aa7-4f17-92b6-e19993fa26df) and [lookup](https://support.microsoft.com/en-us/office/video-vlookup-when-and-how-to-use-it-9a86157a-5542-4148-a536-724823014785) functions.

Teacher leads students in the manipulations and presentation of cells and data to create a pivot table, data dashboard, reports and the modelling of entities and events using structured data over several lessons.

Students can follow directly from the teacher or self direct through watching the [Secrets to Building Excel Dashboards (13:19).](https://www.youtube.com/watch?v=9p6tWCHbtPQ)

Further instructions and activities on Excel can be completed from [W3schools](https://www.w3schools.com/EXCEL/index.php).

As a class discuss how the visualisation of data can be used to identify trends.

## Generate alternative designs

**Generate alternative designs and evaluate them against the requirements to select a preferred design.**

**Plan and manage a project using an iterative approach.**

As a class, students watch [Wireframing Basics (3:10)](https://www.youtube.com/watch?v=aqdn7vVKygA).

Students pick a website or app and create a wireframe to demonstrate their understanding.

|  |
| --- |
|  |

Students are to work individually to develop a wireframe for an app considering the user experience as part of their assessment task.

Produce 2 wireframe drawings to illustrate understanding of user interface and user experience when planning an app.

**First alternate design**

Draw with annotations a solution below.

|  |
| --- |
|  |

**Second alternate design**

Draw with annotations a solution below.

|  |
| --- |
|  |

Having generated 2 alternative designs, these designs progress to being evaluated against the requirements to select a preferred design. Complete the table below.

|  |  |
| --- | --- |
| Requirement | Decision on which alternate design is best suited |
|  |  |
|  |  |
|  |  |
|  |  |

## Self-assessment

Tick the appropriate box for each of the learning intentions.

1 = I need a challenge, I can teach this to others.

2 = I can do this confidently.

3 = I can do this, but need more practice and revision.

4 = I can do this with some assistance.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Learning intentions | 1 | 2 | 3 | 4 |
| Break down a user interface into its basic steps so that they can be applied to a digital solution. |  |  |  |  |
| Determine the user interface needed to complete each step of the interactive media product. |  |  |  |  |
| Plan how each user interface component will look. |  |  |  |  |
| Design a wireframe. |  |  |  |  |
| Represent the user interface in an interactive media product. |  |  |  |  |
| Evaluate a peer’s interactive media product based on their choice of user interface. |  |  |  |  |
| Test and evaluate a UI to improve overall efficiency. |  |  |  |  |
| Evaluate a peer’s interactive media product. |  |  |  |  |

# Producing and implementing

Investigate a real-world problem or need that can be solved by designing for user experience, UIs or creating interactive media. As part of your investigation break the system down into manageable parts and interview stakeholders to identify their needs.

Describe the users in the space below.

|  |
| --- |
|  |

Create a concept map of the chosen UIs or interactive media product, breaking the system down into manageable parts and insert it in the box below.

Students may use a [concept map](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/577?clearCache=5c1f9538-85fb-5265-7945-1d9f8e7cdbd7) template.

Students can also use a [website](https://bubbl.us/) that facilitates collaborative mind map building.

|  |
| --- |
|  |

## Introduction to Adobe Aero

Adobe Aero is an innovative tool in the realm of augmented reality (AR) and mixed reality (MR), perfectly aligning with your interest in immersive experiences and interactive media products. This cutting-edge software empowers creators to design and craft captivating AR experiences without the need for complex coding or specialised hardware.

With Adobe Aero, you can seamlessly blend the digital and physical worlds, allowing 3D graphics, animations, and interactive elements to coexist in real-world environments. Whether you're envisioning interactive product demos, educational experiences, or captivating storytelling in AR, Aero provides an intuitive platform for your creative ideas.

In Assessment task 4 you will make an augmented reality cARd with Adobe Aero’s scaffolded videos. These are presented by James Zachary from the Adobe Creative Cloud Team.

Watch the following tutorials to understand how to use Adobe Aero.

1. [Introduction](https://www.youtube.com/watch?v=m188uKa373Y&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=1)
2. [Installing Aero](https://www.youtube.com/watch?v=jE41jZvguJ4&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=2)
3. [Getting started with AR](https://www.youtube.com/watch?v=PtuYBpvjJKE&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=3)
4. [Setting the stage](https://www.youtube.com/watch?v=0LCSAfx7X-s&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=4)
5. [Crafting a scene around the stage](https://www.youtube.com/watch?v=XORBN2k0U6c&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=5)
6. [Mastering hide and show technique](https://www.youtube.com/watch?v=t-_0cyluHhs&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=6)
7. [Proximity Triggers](https://www.youtube.com/watch?v=Fra8KEfVwWY&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=7)
8. [Adding 3D audio and GIFS](https://www.youtube.com/watch?v=ih5O5Iy6KRY&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=8)
9. [Sharing your work](https://www.youtube.com/watch?v=j1yF3ssgv3E&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=9)
10. [Image anchors](https://www.youtube.com/watch?v=OwCIY_j9Pds&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=10)

## Creating assets for Adobe Aero with Adobe Illustrator

Adobe Illustrator is a powerful tool in the world of interactive media design and development. This versatile software enables users to create intricate 2D graphics and work with layers seamlessly.

Whether you're designing a logo, crafting digital illustrations, or developing immersive experiences in augmented reality (AR), mixed reality (MR), or virtual reality (VR), Illustrator's robust set of features provides the creative freedom and precision needed for your projects.

Its layer management system allows for easy organisation and manipulation of elements, making it an essential asset in the toolkit for those applying computational, design, and systems thinking to their solutions in the realm of interactive media.

As a class, students read [Prepare illustrator assets for Aero](https://helpx.adobe.com/au/aero/using/work-with-illustrator-assets-in-aero.html).

Illustrator tutorials to support student skill development:

* [Create and edit shapes](https://helpx.adobe.com/au/illustrator/how-to/shapes-basics.html?playlist=/services/playlist.helpx/products:SG_ILLUSTRATOR_1_1/learn-path:get-started/set-header:ccx-designer/playlist:ccl-get-started-1/en_AU.json&ref=helpx.adobe.com)
* [Add text to your designs](https://helpx.adobe.com/au/illustrator/how-to/text-basics.html?playlist=/services/playlist.helpx/products:SG_ILLUSTRATOR_1_1/learn-path:get-started/set-header:ccx-designer/playlist:ccl-get-started-1/en_AU.json&ref=helpx.adobe.com)
* [Drawing in Illustrator](https://helpx.adobe.com/au/illustrator/how-to/draw-vector-paths-with-pen-pencil-tools.html?playlist=/services/playlist.helpx/products:SG_ILLUSTRATOR_1_1/learn-path:key-techniques/playlist:topic/set-header:design/en_AU.json&ref=helpx.adobe.com)
* [Design a logo](https://helpx.adobe.com/au/illustrator/how-to/logo-design.html?playlist=/services/playlist.helpx/products:SG_ILLUSTRATOR_1_1/set-header:illustrator-projects/playlist:topic/learn-path:key-techniques/en_AU.json&ref=helpx.adobe.com)
* [Create an icon](https://helpx.adobe.com/au/illustrator/how-to/create-an-icon.html?playlist=/services/playlist.helpx/products:SG_ILLUSTRATOR_1_1/set-header:illustrator-projects/playlist:topic/learn-path:key-techniques/en_AU.json&ref=helpx.adobe.com)

## Creating assets for Adobe Aero in Adobe Photoshop

Adobe Photoshop is a leading software application that plays a crucial role in the creation and manipulation of 2D graphics and layers. Widely used in the field of interactive media design and development, Photoshop offers a versatile platform for professionals and enthusiasts alike. With its comprehensive suite of tools, you can craft stunning digital artwork, edit, and retouch photos, and even prepare assets for use in augmented reality (AR), mixed reality (MR), and virtual reality (VR) projects.

Photoshop's layer-based approach allows for the efficient organisation and editing of elements within your designs. Whether you're working on graphic design, image manipulation, or preparing assets for immersive experiences, Photoshop's capabilities make it an indispensable tool for those applying computational, design, and systems thinking to their interactive media projects.

As a class, students read [Prepare Photoshop assets for Aero.](https://helpx.adobe.com/au/aero/using/work-with-photoshop-assets-in-aero.html)

Photoshop tutorials to support student skill development:

* [Create your first design](https://helpx.adobe.com/au/photoshop/how-to/graphic-design-basics.html?playlist=/services/playlist.helpx/products:SG_PHOTOSHOP_1_1/learn-path:key-techniques/playlist:topic/set-header:quick-starts/en_AU.json&ref=helpx.adobe.com)
* [Create a web banner](https://helpx.adobe.com/au/photoshop/how-to/make-banner.html?playlistPath=/services/playlist.helpx/products:SG_PHOTOSHOP_1_1/learn-path:get-started/set-header:ccx-designer/playlist:orientation/en_AU.json)
* [Create a poster](https://helpx.adobe.com/au/photoshop/how-to/make-poster.html?playlistPath=/services/playlist.helpx/products:SG_PHOTOSHOP_1_1/learn-path:get-started/set-header:ccx-designer/playlist:orientation/en_AU.json)
* [Create an image for social media](https://helpx.adobe.com/au/photoshop/how-to/add-text-pictures.html?playlistPath=/services/playlist.helpx/products:SG_PHOTOSHOP_1_1/learn-path:get-started/set-header:ccx-designer/playlist:orientation/en_AU.json)

## Creating assets for Adobe Aero in 3D

Adobe Aero opens up a world of immersive possibilities by allowing you to seamlessly integrate 3D assets into your augmented reality (AR) experiences. With Aero, you can take your interactive media projects to the next level by incorporating 3D models, animations, and interactive elements. Whether you're designing for education, entertainment, or practical applications, Aero's intuitive interface and tools make it easy to place, manipulate, and interact with 3D content in the real world.

By leveraging 3D assets in Adobe Aero, you can create captivating AR experiences that engage users and bridge the gap between digital and physical realms. This versatile tool is an essential component for anyone exploring the realms of AR, mixed reality (MR), or virtual reality (VR), enabling you to apply computational, design, and systems thinking to craft immersive and interactive content.

File Format you can import directly into Aero:

* GLB (GLTF binary format)

File Format you can import inside an archive (.ZIP)

Note, this folder should include the 3D model and supporting texture and animation files:

* OBJ – With MDL or MTL materials
* Collada
* 3DS
* FBX
* PNG

Most CAD software is able to be exported in the above file including but not limited to:

* Adobe (Dimension, Fuse, Animate, XD and After Effects)
* Autodesk (Fusion 360, 3DS Max, Motion Builder, Maya and AutoCAD)
* Blender
* Google SketchUp
* Vectorworks.

## Record of project development

Plan and manage a project using an iterative approach. Keep a record of project development as it evolves.

Use the following pages as a diary to document the development of your project. Make note of skills and knowledge gained, challenges faced and successes demonstrating iterative design and evaluation.

|  |  |
| --- | --- |
| Date | Description |
| \_\_/\_\_/\_\_ |  |
| \_\_/\_\_/\_\_ |  |
| \_\_/\_\_/\_\_ |  |
| \_\_/\_\_/\_\_ |  |
| \_\_/\_\_/\_\_ |  |
| \_\_/\_\_/\_\_ |  |
| \_\_/\_\_/\_\_ |  |
| \_\_/\_\_/\_\_ |  |
| \_\_/\_\_/\_\_ |  |

# Testing and evaluating

Evaluate your own project using predetermined functional and non-functional requirements in the tables below.

|  |  |  |
| --- | --- | --- |
|  | Specify the functional requirements of your UI or interactive media | Evaluate the functional requirements of your UI or interactive media |
| **The purpose of a system** |  |  |
| **Describe use cases** |  |  |
| **Develop test cases of inputs** |  |  |
| **Develop test cases of expected outputs** |  |  |

|  |  |  |
| --- | --- | --- |
|  | Explain the non-functional requirements of your UI or interactive media | Evaluate the non-functional requirements of your UI or interactive media |
| **Branding and marketing of the solution** |  |  |
| **Minimising cognitive load and physical movement to use the interface** |  |  |

Evaluate your peers using predetermined functional and non-functional requirements in the tables below.

|  |  |  |
| --- | --- | --- |
|  | Specify the functional requirements of your UI or interactive media | Evaluate the functional requirements of your UI or interactive media |
| **The purpose of a system** |  |  |
| **Describe use cases** |  |  |
| **Develop test cases of inputs** |  |  |
| **Develop test cases of expected outputs** |  |  |

|  |  |  |
| --- | --- | --- |
|  | Explain the non-functional requirements of your UI or interactive media | Evaluate the non-functional requirements of your UI or interactive media |
| **Branding and marketing of the solution** |  |  |
| **Minimising cognitive load and physical movement to use the interface** |  |  |

Evaluate if your designed solution meets social, ethical and legal responsibilities and cybersecurity principles in the table below.

|  |  |
| --- | --- |
| Consideration | Evaluation |
| **Social issues** |  |
| **Ethical issues** |  |
| **Legal responsibilities** |  |
| **Cybersecurity principles** |  |

Test and evaluate a UI to improve usability of an interactive media product in the table below.

|  |  |  |
| --- | --- | --- |
| Product | Component of UI | Results of testing and evaluating |
|  |  |  |
|  |  |  |
|  |  |  |

Test and evaluate a UI to improve overall efficiency in the table below.

|  |  |
| --- | --- |
| Component of UI | Results of testing and evaluating |
|  |  |
|  |  |
|  |  |

Evaluate the functionality of the UI to convey information to a variety of audiences in the table below.

|  |  |
| --- | --- |
| Audience | Evaluate the functionality of UI to convey information |
| **Young children** |  |
| **Students** |  |
| **Adults** |  |

# Careers

Identify the vast number of pathways into the industry, with a focus on tertiary education. Explain the competitive nature of the industry and prevalence of small start-up companies.

Careers can include:

* Social media specialist
* Animator
* Video editor
* Web designer
* Digital advertising specialist
* Digital marketer
* Multimedia graphic designer
* Video game designer.

Explore careers in UI design or interactive media, by completing the table below.

|  |  |
| --- | --- |
| ****Field**** | ****UI design or interactive media career example**** |
| **Game development** |  |
| **Web Design** |  |
| **VR/AR** |  |
| **App development** |  |

Who is considered a pioneer in the field of interactive media or UI design, and what significant contributions have they made?

|  |
| --- |
|  |

How has the evolution of interactive media and UI design influenced the way we interact with technology today?

|  |
| --- |
|  |

What are some key skills and qualities required to succeed in the field of interactive media or UI design?

|  |
| --- |
|  |

What are the current trends and emerging technologies in interactive media and UI design, and how are they reshaping the industry?

|  |
| --- |
|  |

What ethical considerations should designers keep in mind when creating interactive media or UI interfaces?

|  |
| --- |
|  |

Research 3 current existing positions and their criteria from current employment websites such as [SEEK](https://www.seek.com.au/), [Indeed](https://au.indeed.com/) and [CareerOne](https://www.careerone.com.au/).

|  |  |
| --- | --- |
| Criteria | Response |
| Job title |  |
| Training required |  |
| Personal requirements |  |
| Outline of duties |  |
| Average income |  |

|  |  |
| --- | --- |
| Criteria | Response |
| Job title |  |
| Training required |  |
| Personal requirements |  |
| Outline of duties |  |
| Average income |  |

|  |  |
| --- | --- |
| Criteria | Response |
| Job title |  |
| Training required |  |
| Personal requirements |  |
| Outline of duties |  |
| Average income |  |

# References

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