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EXCELLENCE EXEMPLAR 2022

2



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COMMON ASSESSMENT TASK

Level 2 Digital Technologies and Hangarau Matihiko 2022

91899 Present a summary of developing a digital outcome

Credits: Three

Achievement Criteria		
Achievement	Achievement with Merit	Achievement with Excellence
Present a summary of developing a digital outcome.	Present an in-depth summary of developing a digital outcome.	Present a comprehensive summary of developing a digital outcome.

Type your School Code and 9-digit National Student Number (NSN) into the space below. (If your NSN has 10 digits, omit the leading zero.) It should look like “123-123456789-91899”.

- 91899

Answer ALL parts of the assessment task in this document.

You should aim to write **800–1500 words** in total.

Your answers should be presented in 12pt Times New Roman font within the expanding text boxes.

The only resource you may access during this assessment is your digital outcome for reference only. The three images you prepared in advance are the only information you may copy and paste into this assessment. No other internet access is permitted.

Save your finished work as a PDF file with the file name used in the header at the top of this page (“SchoolCode-YourNSN-91899.pdf”).

By saving your work at the end of the examination, you are declaring that this work is your own. NZQA may sample your work to ensure that this is the case.

Instructions

The task in this assessment requires you to discuss a digital outcome you developed within the past 12 months.

You should illustrate your answers with three images you have prepared in advance:

- a single image of the digital outcome (e.g. a website, a poster, an electronic device)
- a single image showing a relevant digital component of the outcome in the software used to create it (e.g. the HTML / CSS for a website, the “layers” view of a poster, source code, a CAD / CAM file)
- a single image of the planning / development process (e.g. agile development, a planning chart).

During this assessment, you may access your digital outcome for reference only. The three images you prepared in advance are the only information you may copy and paste into this assessment. No other internet access is permitted.

Read all parts of the task before you begin.

Assessment Task

Your outcome

- (a) (i) Insert the image you prepared of the digital outcome (e.g. a website, a poster, an electronic device).



- (ii) Explain the purpose of your digital outcome.

The purpose of my digital outcome is to help highschool and university students study for exams more efficiently and effectively. The robot device has a timer and health messages such as “do 5 start jumps” and “Get some more water” to help students develop positive and beneficial study habits. It is intended to be used for tools such as the timer which will limit the need to use a phone. Which users would then be distracted from their study with games and social media. It is a device which I intend to sell to customers who are my target end users who want a distraction free environment to study in.

- (iii) Describe what your digital outcome looks like and how it works.

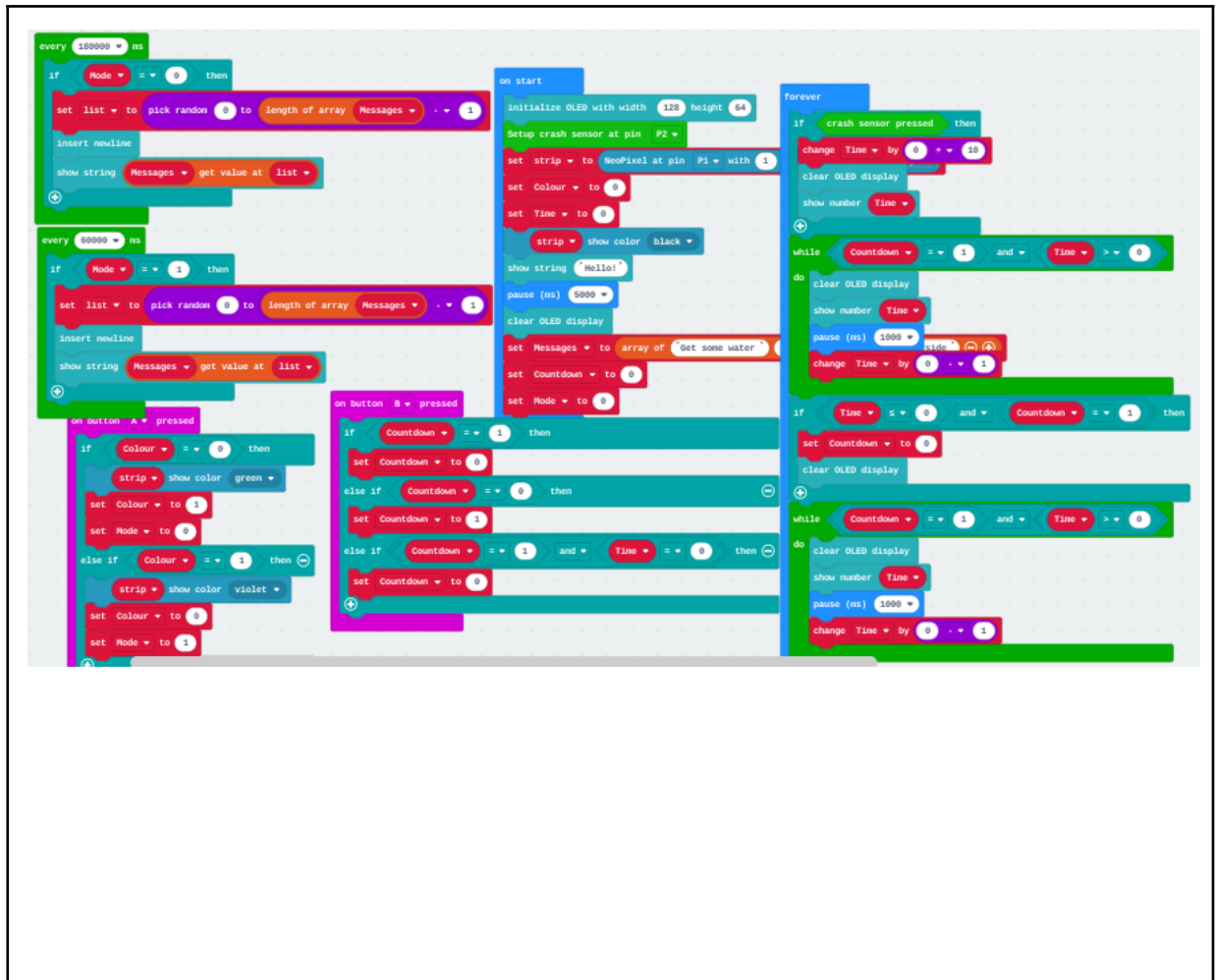
My digital outcome looks like a physical grey robot box with 3 buttons, a screen and a light. When it is turned on a message saying “hello” will appear on the screen for a few seconds. There are 3 buttons, all of which have separate functions.

The left red button when pressed will turn on the light in the top left corner to a green colour. This signifies to the user that the messages system has been activated. Meaning health messages will appear on screen in regular intervals. When the same button is pressed again, the colour of the light will change to purple. Which tells the user that the health messages system is now deactivated, so no messages will appear at all while the light is purple. Pressing the button again will turn the light back to green, reactivating the messages. This means the user has control over whether or not they want health messages during a certain study period. Which optimises the user's experience with my device.

The button at the bottom of the device is used to add time to the timer. Each time it is pressed it adds 10 seconds to the timer. This button is a crash sensor which is different to the other 2 buttons. This is because this button needs to be pressed multiple times to reach the users desired timer amount. Using a crash sensor means that the user can hold down the button and 10 seconds will continuously be added on. The button itself can be pushed in different areas that make adding heaps of time or just a couple of 10 seconds very easy. This means that users can have their desired use of the button in a way that works for them. The amount of time the user has put on, is displayed on the screen at all times.

The right red button is used to start and stop the countdown of the timer. When pressed and there is time, the time will go down by 1 each second. This is displayed on the screen as the time changes each second. This will continue until the time equals 0 where the countdown will stop. However if there is time left and the button is pressed again then the countdown will stop and the current time it was stopped will be displayed on the screen. Then if the button is pressed again it will resume the countdown of the time.

- (iv) Insert the image you prepared of a relevant digital component of the outcome in the software used to create it (e.g. the HTML / CSS for a website, the “layers” view of a poster, source code, a CAD / CAM file).



- (v) What software did you use to create the digital components of your outcome? How suitable was this software? You may include more than one software in your answer.

A software that I used to create the digital components of my outcome was “Microsoft Makecode”. It is a software designed for microsoft components and uses block commandes to code. This was helpful for me in the development of my digital outcome as it is the only way I know how to code. This meant I was confident and familiar when working with this software meaning I could create more complex code that I understood. If I did not use this software then I would have had to learn a whole new coding language such as python to create my outcome. This would have been negative to my development as I would have to spend time learning how to code instead of coding and creating. I used this software to code all of my electronic components such as buttons and the screen. This software was very suitable for my digital outcome as it was compatible and designed for the electronics I was using such as a micro bit. This meant that the software had specific commands for the electronics to achieve exactly what I wanted to happen. This resulted in a better development process that was efficient and effective. If the software was not compatible then I would have had to convert the code or create commands which would have taken up precious time and been a more stressful workload. Especially as I tested the outcome very often when I made a change to see if it worked.

Another software that I used which was suitable for my components was “Tinkercad”. I used this to create the outer box and buttons which were laser cut and 3-d printed

respectively. This software was very easy to use making the development of these components efficient and effective. It was suitable and compatible with both the different machines I used. I had also worked with this software before, so I was confident using it and it took me minimal time to get familiar with it again. The software itself was simple which helped me create exactly what I wanted.

(vi) What were the TWO most important requirements of your digital outcome?

In your answers you should:

- explain what the requirements were
- explain why they were important
- explain how you implemented these requirements
- give specific examples of how these link to the digital components.

Requirement 1: Easy and simple usability

Response

A requirement that was important to my digital outcome was simple and easy usability. This is important to my outcome as the purpose of the device is to help students study. The device can only help students if they use it. If I didn't have good simple, easy usability then users would become frustrated with my outcome and wouldn't want to use it as it's hard to use. My targeted end users have a lot to do, so they will not use something that takes a lot of time to understand. Therefore I needed to create an outcome that was very simple and easy to use.

I implemented this requirement in the development of my outcome by always thinking about how to make my components be optimized the most. I decided to achieve this with the buttons. This is because having heaps of buttons can be very confusing and take a lot of time to learn what each button does. Therefore I coded my outcome so that buttons could do multiple things for a component. For example the button to start and stop the countdown. I could have created 2 buttons, one for start and one for stop but this would have confused users as they would have to learn which is which. Combining them into 1 button means that the users will know that that button is for the countdown. It is then up to the device to understand what the user is wanting to happen. This is very easy for a robot to do because if it's stopped then the robot will start it as it's the only other option. Overall this means that the usability of the device is concise and practical making it easy for the costumes to use and simple to pick up, understand and remember. Especially as there are only 3 buttons, all of which have been optimised to the max. Eg; the Light button works the same as the countdown button.

Requirement 2: Sleek Aesthetics.

Response

An important requirement for my digital outcome was sleek aesthetics. This is important as I intend to sell my device to customers. Meaning that for my outcome to do its purpose it needs to look appealing enough to buy. I addressed this by painting the robot a light grey colour, I did this because my target end users are highschool and university students. At this age the students are more mature and don't want something that's a bright colour like red, pink or neon yellow. So a light grey colour is more appealing. The robot is an electronic device so the colour is a monotonous colour which is the same as other useful digital devices such as phones and laptops. This makes the user automatically think that the robot is a useful digital device that looks professional. The design of the device is a rectangle box shape, this is an unassuming shape meaning it can blend into a room and not look like an eyesore. The device having sleek aesthetics means that users will feel comfortable using it, resulting in them using the device to its full purpose.

(vii) What were TWO relevant implications you chose from legal, future-proofing, or end-user considerations?

In your answers you should include:

- why the implication could impact your outcome
- what you included in your outcome to address the implication.

Relevant implication 1: Legal

Response

A relevant implication that impacted my outcome was legal. This is because my digital outcome is a physical object that is sold to users. This means I can be legally liable if a customer was hurt when using my device, meaning they would be able to sue me.

Therefore I needed to address the implication in my outcome. Firstly my device has electronic components such as wires which users could accidentally touch and get an electric shock from which can be very serious and thus I get sued. Therefore I need to create something that would ensure that users could not get access to the electronic components. I made the decision to create an outerbox that would hold all the components inside and have buttons that users used to interact with the device and see only the parts they needed to see like the screen. This meant that users were safe from the components inside.

However I created the box out of wood, which users could get splinters from and it also had sharp corners which the users could cut themselves on making me legally liable for being sued. To address the first I decided to paint the wood box with grey paint. This gave the robot a smooth outside that acted as a protective layer so that when users used it they wouldn't hurt themselves on the wood by getting splinters. For the second one I decided to round out the sharp edges. I did this by sanding them, meaning that it was very smooth and

not rough at all. Which protected users and kept me legally safe from being sued.

Relevant implication 2: Future proofing.

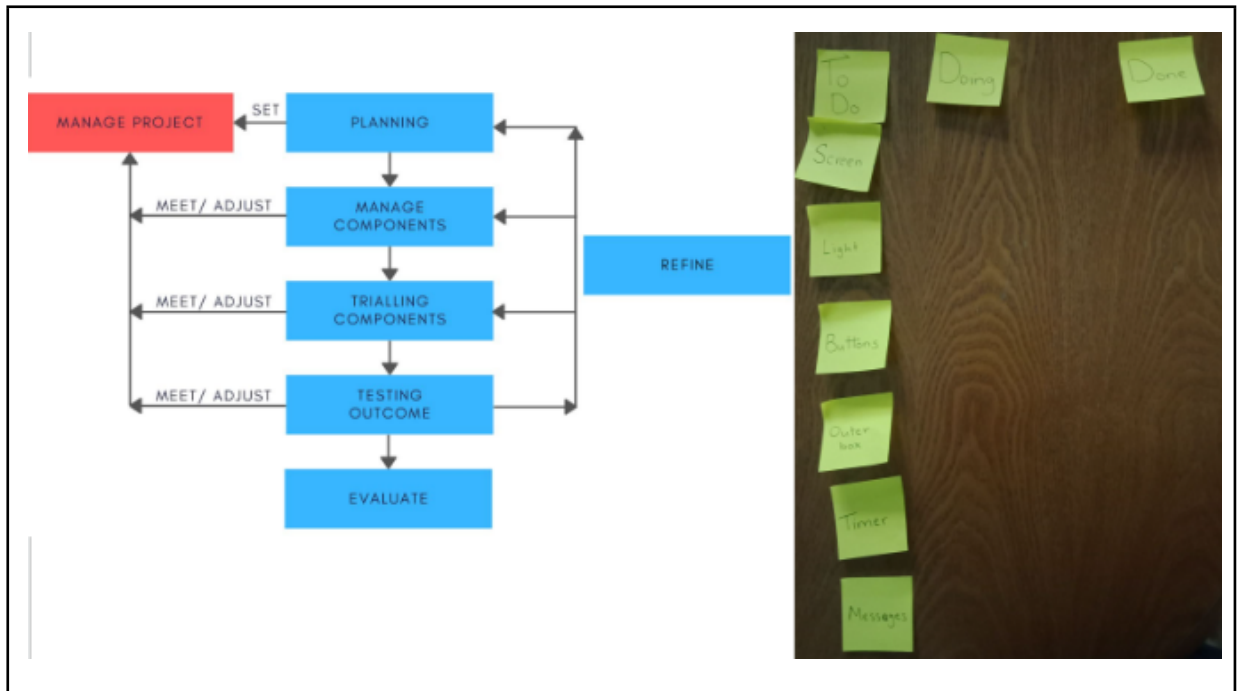
Response

Future proofing is a relevant implication in the development of my digital outcome. This is due to the device being only the minimal viable product of the outcome that I was working on in 1 hour increments. Therefore it needs to be future proofed so that I or someone else can come back to the code in a few years time and be able to continue developing it. This means that the code needs to be simple and understandable so as to not confuse me while making it and so that someone else can quickly understand what does what in the code.

I addressed this by making my variable names very simple and logical as I had multiple different variables. If I didn't name them logically then I would have become confused as to what the variables were for. Therefore I named the variable for determining the light colour to be "light", the variable number that was used to keep count of the time added to the timer was named "time", and the variable that I used to activate or deactivate the countdown start or stop was named "countdown". These names ensure that anyone whether it be me, my teacher or someone in the future will be able to understand what variables are used in a specific component and what they hold information for. Having these logical names meant I didn't waste time having to figure out my own code, and was able to use my time to focus on developing my outcome.

Development process

- (b) (i) Insert the image you prepared of your planning / development process (e.g. agile development, a planning chart).



- (ii) Briefly explain each stage of your development process.

I followed a multi staged process for my development process. First I planned, then managed my components, trialled my components and then tested the whole outcome. All the while refining and managing my project through my project management of sticky notes as seen in the picture on the right.

Planning my outcome was the first step in the process, here I planned what I was going to make and how I was going to do it. This involved setting up the sticky note list and a calendar with times I wanted things to be completed by to ensure I was on track to finish by the due date. It also allowed me to easily work on multiple at a time for when I needed to take a break from one because I became frustrated with it. which happened with the timer component.

Managing my outcome was when I broke down my outcome into easy to manage components. This meant that I could work on a specific component at once and have a piece of the full outcome be done. I managed this by the sticky note chart. This was arranged with three columns, "to do", "doing" and "done". Through this I could clearly see what components I had left to do and how many I had done. Which helps me get the full outcome done efficiently.

Trialling the components was where I spent the most of my time. Doing this step allowed me to test and see whether the code I had written actually worked properly as I had intended. If this step was not in here then I would never figure out if my code worked until the very end. This is where I refined the most as I had to keep trailing different code until it finally worked correct.

Finally testing my outcome, I was able to see if all components worked together. which was very helpful as when I trialled my outcome for the first time, one component made everything else not work. Therefore I could refine to the outcome to make sure all



components worked together nicely.

Overall this development process kept me on track and gave me a simple step to work toward my full outcome. This meant I wasn't stressed and didn't forget any important development steps.

- (iii) Explain TWO decisions you made during your development process and judge how well each decision was carried out. Explain how they affected / impacted your outcome.

Choose your TWO decisions from the list below:

- which experts to work with (when and why)
- how you project-managed your project
- the design process you followed
- the testing and trialling you did with certain people or groups
- specific tools and techniques used within the software chosen to develop the digital component.

Decision 1: which experts to work with (when and why)

Response

The decision I made of which experts to work with during my development process was a decision well made but could have been better.

During the development of my outcome there were parts where I didn't know something such as coding a specific component or how to work a machine I had never used before. Each time that happened I made the decision to seek help from experts. For the most part I found these experts on the internet through question forums and on sites such as youtube. I watched and read lots of information from multiple experts and was able to gather all the information and use it for my specific problem. Which was beneficial as I was often creating things no one had done before. I decided to use these experts and get information after I had given a very long time to trying to figure out how to do it myself. For example, I had a lot of difficulty continuously adding numbers to a variable. I finally decided to work with experts because if I didn't then I would be stuck on a certain component for more time than I had allocated. Which would have ruined my project management timetable for my development process. Once I worked with the experts I was able to quickly fix my problems and continue with development. I believe I could have made the decisions to work with experts better if I had decided to do it early. Multiple times in the development I left this decision late, meaning I wasted a lot of time. However I believed that the decisions on what experts I used to be good, as I gathered a range of information from multiple. This was good as often some were incorrect in their advice. This affected my outcome as the information from experts enabled me to finish my outcome fully working. If I didn't make this decision then I would not have fully completed my outcome and some things I wouldn't have been able to code.

Decision 2: the testing and trialling you did with certain people or groups

Response

I decided to test and trial by components and outcome with people who were my target audience of highschool and university students. This was beneficial to my outcome as I received feedback from potential users as to how I could improve my outcome during development. I often receive feedback from the users which was also part of the requirements for my outcome. For example “there are too many buttons, I don't remember what they do”, which told me that I needed to develop my outcome to be more simple. Getting feedback like this directly impacted my outcome as I made changes to accommodate and fix issues the people who tested my outcome gave me for the better. I believe that I could have carried out this decision better by getting people to test my outcome more often for specific parts, potentially giving them options and asking what is better. This would result in a better outcome as people who are giving feedback generally don't know the possibilities that could be achieved. I believe I could have also done better by getting different groups to test the outcome. I typically used my friends and family to get feedback. This might have been bad for my outcome as they didnt give me truthful advice because they wanted to be nice to me. Meaning my outcome could have been better.

- (iv) Based on what you learnt through the decisions discussed above, explain and justify what changes you would make to your development process, and how these changes could further improve the quality of your outcome.

I would make the change to the development process of adding a step before trialling components which would be a step of researching. Adding a research step before trialling and making my components would mean that I would be well informed on what I was about to make and how it should work. For example, I need to have an array in my code to hold the health messages. But I had never used arrays before, and so instead of researching how they worked, I just started coding. This resulted in me wasting my time by trialling code that I had no idea whether it might work. By adding this stage of researching before trialling, I would have researched and learnt about arrays before I started to write code for it. This would reduce the amount of wasted time and make me feel more empowered and confident as I fully understood what I was coding. This would keep me interested in developing the outcome at a high quality level. Especially as during the development process there were many times I lost interest in the outcome as I was stressed and confused. More free time would give me more time to create better components. Resulting in a more fully completed outcome, rather than the Minimal viable product that I finished with. Researching components that I already know how to do would allow me to push my level of understanding of them higher as I learn more complex ways they can be done or used. This would increase the overall quality of my outcome as it would be more well thought through and engineered.

Excellence Exemplar 2022

Subject	Digital Technologies Level 2		Standard	91899	Total score	07
Q	Grade score	Annotation				
(a) & (b)	E7	<p>This is an example of an authentic electronics outcome where the candidate has created both a functional electronics component and the housing to make the robot usable.</p> <p>At Achieved level the candidate's responses have included clear detail about how the device is used as if you were using it yourself. At Merit one requirement links directly back to the digital component being the code and the other about the physical appearance, which includes justification as to why the look has been considered.</p> <p>At Excellence level the candidate has clearly discussed what they would have done differently in their development process and how it would positively impact the outcome with specific examples.</p> <p>The candidate has evaluated their decisions.</p> <p>To get to 08 the candidate would need to make some of the details clearer by giving specific information about one example for each response and having a stronger link back to the code. This could allow them to make the one judgement and leave the rest for improvements.</p>				