Final Year Project Report

Full Unit – Final Report

Human Computer Interaction

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Abstract

Human computer interaction (HCI) combines computer science, cognitive science, and human factors engineering. HCI began to be a popular topic of discussion that appeared in the late 1970s when more people had access to interfaces which affected personal computing. (Dix, n.d.) An example of HCI is through a desktop metaphor demonstrated by the apple Macintosh where you would be able to see files and folders as icons that could be dragged and dropped. However, some people use Linux, where you used commands back then. Even though at the time, it seemed odd to move these icons around, this trend has become part of our everyday lives. This is an excellent example of how HCI can make a user find a process more personal and meaningful to them. (Sawyer, 1992)

Considering HCI is a quite widespread topic, there are several ways to measure how effective the interface's design is, one suggested method uses four design principles: (1)Learnability/Familiarity, (2)Ergonomics/Human Factors, (3)Consistency/Standards, (4)Feedback/Robustness. (Hinze-Hoare, 2004) The four principles cover the full range of System/User/Input/Output Interaction between a user and an interface. I agree that these principles measure HCI well, as humans will process information in a specific way, understand it, and then receive it in a consistent and familiar design throughout an interface to create feedback that can allow the design to grow. In regard to my interfaces these principles in particular can increase/decrease the usability of my interface: (1) the more difficult it is for the user to interact effectively with the interface the less of a chance they would want to use it regularly and gain the familiarity in using that interface. This learning time can be decreased by making use of the user's existing knowledge. I think this is incredibly important for my interfaces as one of them is an interactive learning tool so therefore the familiarity drives the memorability of the learning for the user.

I chose this project because I wanted to understand how different types of users interact with an interface and how designers combat certain issues in order to make my interface more resistant to those issues, and I would like to spend more time researching how these types of issues can be mitigated against and how I can make similar judgements within my ideas to allow my users to interact with my interfaces fully. I would also like to learn how to create an interface that can be used intuitively for different types of users.

HCI is quite broad and I only have a limited time to complete these three interfaces, which means that I have decided to focus my time on solving issues like aesthetics, design, navigation, feedback to the user, and cognitive issues (memory). I will ensure that these issues will be fully explored before implementing any onto my interfaces and going through reasonable research to back my mitigations to make the interface as usable as possible. All of my interfaces will be websites that are directed to different target demographics. Therefore, I will try to match many of the visual parts, such as aesthetics, to all genders. Nowadays, certain websites can be more influenced by feminine/masculine and less inclusive to everyone. (Abrosimova, 2019) This can take up in the form of the colour themes or even when filling out a form you only get a choice of male and female. So I will consider these factors and make sure to make it as inclusive as possible. Since one of my ideas will be a parent-guided website but a child learning, the navigation must be simple enough to use so that a child can use their cognitive functions to learn from this website. It is important to note that children's cognitive functions are still developing so this particular interface will require quite simple navigation/format so that they don't get overwhelmed. My third idea will also be teaching something to the user, specifically computer literacy, I believe this links well with HCI as I can see how well a user can interact with an interface by seeing if they better understand how to use computers and different operations.

I hope to achieve a better understanding on how to make an interface more inclusive through design as well as allowing more people to understand basic computer literacy through understanding which parts of design correlate with computer literacy. I would also like to be able to create a design that

instils familiarity and allows children to add to their working memory that will help them retain their new perception and processing of shapes.

Interface Criteria and Reasoning

Mental Health Online Journal

My motivation behind this interface is that as someone who is in this age range (ages 16 -25), It is my understanding that we do have a lot of resources to seek mental health help however little to no private place to just express our emotions and anxieties. I also believe as our age group also has very gendered influenced mental health so I would like to address the problem through aesthetics and using all pronouns to make sure to show that anyone can use this interface and that mental health can happen to anyone. This would be example of inclusive design to allow ultimate customisation for a user. (Joyce, 2022) I will still be providing resources to mental health access but this journal will be a like a middle-man between someone's thoughts and talking to someone.

The reason I want to create an online journal is because journaling for mental health can help manage anxiety, reduce stress, and cope with depression. (L Renee Watson, n.d.) As journals are supposed to be used regularly, this allows me to explore the theme of familiarity.

Research shows there is a lack of access for 16-25 year olds who have a significant gap from first showing symptoms and then only getting help 10 years later. (Khan, 2016) I also found that people from this age groups that are LGBTQ+ can have more mental health issues to bullying at young age or just neglect. That is one of the many reasons I would like make this interface very welcoming and private to a user, so they do have a place to keep their private thoughts.

Target Demographic: all individuals age 16-25, regardless of other features (such as sexuality or race)

Technologies to be used to create this: React (Doc, n.d.), React-Bootstrap, HTML, CSS, Node.js and Firebase (Doc, n.d.)

Interfaces that it will consist of:

- **Home page**
- **Create Account Page** – Taking information relevant like, e.g. name, email, and password.
- **Login page** – As I have explained previously, this space has to be private to a user to make them feel like they can trust this journal and confide into it.
- **Settings** – I would like to have certain Daily/Weekly/Monthly Affirmations and Mood settings that can be changed depending on the user's preferences.
- **History Page** – History of any journal entries.
- **Journal** – A user will be able to create a new entry allows you to set a date, automatically sets to current's day, a place to write thoughts.
- **Reach out to assistance Page** – to go seek help, resources to specific age groups/location.

A Parent-guided shape learning tool for young children

I want to create this website as I am curious about how young children learn and how they retain certain information throughout their lifetime, for example shapes. Another reason I am making this a parent guided website is because children can't interact with a website unless it was one specific platform where they could tap on/click on a screen. I thought shapes would be a good learning topic as when we become older, generally we can recognise shapes more easily in complex objects for example a bike has two wheels which to a child is like 2 circles.

The reason I choose to pick shapes as the topic to learn is because it sets up children to understand math, sort and categorise, learn letters and numbers, use descriptive vocabulary, use visual discrimination. (BabySparks, 2019) Generally, by three years of age, a child should be able to identify some basic shapes. It also mentions how colours will be recognisable from 18 months as it will be normally natural to grasp that idea. (Academy, 2017)

Target Demographic: (18 months – 3 years old+, as described above.)

Technologies to be used to create this: React, React-Bootstrap, HTML, CSS and Node.js

Interfaces that it will consist of:

- **Home Page** – Introducing to parents what this website hopes to achieve – teaching shapes to children
- **Settings page** – If a child had trouble recognising colours, I would have a monochrome setting since the shapes could be recognisable by patterns.
- **Information Page** – It will have different webpages for shapes.
- **Example Shape page** – Images of different shapes that could be hovered on to everyday objects, e.g. a circle will be highlighted over a car wheel, baby bottle. These objects should be objects that children see more often in their everyday life rather than unusual objects. The circle will have its own pattern to be recognised in that way too. It could be a dotted pattern so it still fits in the theme of a circle.
- **Quiz menu:**
    - **Quiz page** – testing their memory on basic shapes due to colours/pattern association.

A Practice Website for Computer Illiterate Users

I would like to create this environment as most applications and websites assume users are computer literate and therefore may be inaccessible to those who are not familiar with computers.

It estimates that the number of people in the UK lacking basic digital skills is declining, but in 2018, 8% of people in the UK (4.3 million people) were estimated to have zero basic digital skills (are unable to do any of the activities described in the five basic digital skills). A further 12% (6.4 million adults) were estimated to only have limited abilities online (missing at least one of the basic digital skills). (Statistics, n.d.)

The digital divide that is created by not having these skills means that these users are disadvantaged and unable to interact the same and have access to these interfaces in the same way Therefore I would like to bridge this gap by incorporating some of these skills and teaching these types of users.

Computer Literacy can be defined as the ability to efficiently use computers and modern technology. (Team, 2022) There are several ways of measuring these skills, the most common skills are: using equipment, e.g. moving the mouse, typing on the keyboard, browser/search engines, e.g. making sense of how to search effectively, word processing skills, e.g. text formatting, introduction to ‘undo’ and ‘redo’ buttons in an application, communication, e.g. social media: liking a post, writing comments. (Twinkl, n.d.)

Similarly, as HCI and computer literacy are both broad topics, I shall be only focusing on three parts of how to teach a user to be computer literacy.

- **Browser/Search Engines**
- **Word Processing Skills**
- **Communication**

The reason I will not be creating an interface on how to use equipment (hardware accessories e.g. keyboard) is because I think it will be hard to find a correct way of showing the output of these actions unless someone was explaining them how to do these particular actions. Specifically since feedback to a user is one of the issues I will be tackling, I want to be able to present a clear and simple output to the user.

Target Demographic: General Population – computer literacy isn't restricted to particular age or other human factor as it a familiar skill only introduced onwards from 1978. (Etherington, 2018)

Technologies to be used to create this: React, React-Bootstrap, HTML, CSS and Node.js

Interfaces that it will consist of:

- **Home Page –** A short description on what computer literacy is and how this website will try to combat this.

  These pages specifically will all be a simplified sets of wireframes to act like each of these different applications:
  - **Browser/Search Engine Page** – This page will have examples of search bars and browser features, e.g. an empty search bar to search specific keywords to find specific websites that are well known to familiarise them on those of the names of the websites.
  - **Word Processing Skills –** How to create an email, how to tell difference between emails and URLs. Send/Reply/Reply All/Forward an email.
  - **Communication (in regard specifically to social media) –** How to create posts, like/comment, Public and private settings.

Using these different computer literacy tests to create standards of what should be taught:

- (Minnesota, n.d.)

Project Timeline

Term 1			
Start of the week (date)	**Milestones**	**Additional Notes**	**Deadline Date**
19/09/22	Writing up the proposal plan	Without having a plan, I cannot create my interfaces with reasoning behind it.	
	Further research on HCI issues	Focus on my chosen issues and research on how to mitigate against it.	
	Create an React app	I have some experience with React, but I'd like to try to build the app on my machine to make sure it can run easily.	
26/09/22	Draw/Plan out wireframes for these simple interfaces	To allow me to not focus on the design aspect but the functionality when designing the sample interfaces.	
	Experimenting with React/React-Bootstrap, making simple interfaces	Since I have previous experience it should help, however some things still will be new to me so, I'd like to make a very simple login for example without adding any css or design features yet.	
03/10/22	Continue to learn more about React, and the different components that can be made	E.g. React has specific modules can create specific URLs for the websites when it comes to navigation. These skills will be continuously be changing while I'm learning to make these interfaces.	
	Set up all the different 3 React projects	In separate branches, I can create separate React applications in a GitHub repository so that when I have to start working on them they are ready to edit.	
	Complete the Project Plan	The plan is due at the end of this week.	**Project Plan – Due 07/10/22**
10/10/22	Start making wireframes for each of my interfaces.	So that once I set up my environment it will be easy to start making components/pages for each of the interfaces.	

	More research into how each interface will be designed.	E.g. My first idea is based off inclusive design, so I need to make sure that whatever I plan to make aligns with that design structure.	
	Start collecting any types of media, which will be used for the interfaces.	This allows me to easily save it to the right folder in git hub and work my ideas around them.	
	Start on my mental health journal interface. Start creating general structure such as the navigation header.	I need this done for each page so that I can easily populate and start working on individual page structure.	
	Start on the final report.	Making sure I don't fall behind on the report.	
17/10/22	Work on create account and login page.	They are the both will have simple structures. But I also will need to figure out how to save the data to a database and retrieve data from the database.	
	Work on these pages superficially: Settings, History Page, Journal, Reach out to assistance Page	Just the basic general structure, not too much functionality.	
	Researching different ways of journaling and how to design the structure for it.	Allowing myself to makes sure the design of the journal page is most suited for my target demographic.	
	Work on my report.	The report has to be explained well enough even if you couldn't see my interfaces.	
24/10/22	Start to create pages for my shape learning tool.	Home, Settings, Information Page.	

	Finishing off any functionality left on my mental health.		
	Research on how to make images interactive for my shape page.	So I will be able to show different shapes on top of images.	
	Start on quiz page.	Research on how to best allow children to remember things.	
31/10/22	Start on computer illiterate user interface.	Creating general structure for all the pages Home Page, Browser/Search Engine Page, Word Processing Skills, and Communication. The specific pages other than Home will have several specific components – so research how to teach that skill online rather than implement functionality.	
	Finish quiz page for shape learning tool.		
	Keep working on the report.	The report has to be explained well enough even if you couldn't see my interfaces.	
07/11/22	Finish shape learning tool interface.		
	Start creating components for Browser/Search Engine Page, Word Processing Skills, and Communication Pages	Making interactive search bars for example and creating email text boxes to write in.	
	Go back to any of the other interfaces to check for bugs.		
14/11/22	Finish off my computer		

	illiterate user interface.		
	Keep working on the report.	The report has to be explained well enough even if you couldn't see my interfaces.	
21/11/22	Starting to clean up any of interface bugs.	Allowing my work to be ready to be tested.	
	Creating a draft version of the report.	The report has to be explained well enough even if you couldn't see my interfaces.	
28/11/22	Finishing off my interfaces.	Making sure it is good to be presented and for my testing.	
	Make sure all my testing is finished for my interfaces.	Making sure everything is working and functioning as it should be.	
	Preparing for the presentation.	Making sure all my research and interfaces are ready to be used within the presentation.	
	Finish my presentation.	It is due for the start of next week.	**Interim report/Programs– Due 02/12/22**
05/12/22			**Presentation– Due 05/12/22**
Term 2			
09/01/2023	Making any changes that is needed form getting feedback on my interim.	The feedback on the interim should be made as soon as possible.	
	Going back to my mental health journal.	Seeing if I can add more inclusive design if possible.	
	Work on my report	The report has to be explained well enough even if you couldn't see my interfaces.	

23/01/2023	Going back to shape learning tool.	I would like to add more detail to add patterns if I can to allow children to recognise shapes without regard to colour.	
	Work on my report	The report has to be explained well enough even if you couldn't see my interfaces.	
06/02/2023	Going back to my computer illiterate user tool.	Adding specific design features accordingly. E.g. Email creation and adding icons to identify certain things.	
	Try to create a draft final report.	To try and receive some last main feedback before drafting the final report.	
20/02/2023	Looking at all my interfaces and cleaning up all of them.	At this point, I shouldn't be changing anything major, and focus on cleaning it up.	
	Doing any testing required.	Making sure all interfaces are at a required standard of functionality.	
06/03/2023	Making sure all functionality is there and working.	I will need to start finalising my report soon, so I need to be able to show and demo all my interfaces.	
	Do any more research that is needed.	This should be finished by this week so it's ready to add/edit on my final report.	
	Make sure all my testing is finished.	To make sure all my tests can recorded and explained in the report.	
20/03/2023	Complete all my interface and finish off my report.	Both will be due this week.	**Final report/Programs – Due 24/03/23**

Risk Assessment

Risk	How likely is the risk to occur	How significant the risk is	Mitigation
Time Management – As I have other modules that also have assignments I have to complete on time.	High – I can get stressed easily from other assignments and might to neglect the project.	High	I will dedicate time for this project by working on it 2 hours every day. Allowing myself to be able to work on any issues earlier and able to get any feedback from my supervisor.
Mentally Burning Out – I can get stressed out easily by worrying about my coursework and the project.	Medium/High	High	I'm going to try and spend my energy where I can and then also take regular breaks, e.g. If I have spent already 2 hours working on the project, I might take a break and then come back to it either in the same day or the next day or if I've had this problem for a while.
Learning how to use React and Node.js together. These languages will be using will be new to me, and will might take additional time then the planned time.	High/Medium	Low/Medium	Organise my time to allow myself to have enough time to research as well, time to learn new languages for the technologies since I assume that will take the longest and the setting up the environments rather than the coding for the interfaces.
I might lose my work, if my laptop crashes, or some other accident that is not foreseen.	Low	High	I will be upload all my work to a git hub repository that I will regularly commit and push to. This will include all the reports and reading

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