Annotated Table of Contents Coursework COMP-1649 Human Computer Interaction and Design

This is an example of how a table of contents for your coursework report COULD look like. You can use a different structure to what is shown here as long as the relevant content is covered. This is a basic example showing what is needed in the report. Do not forget to make reference to relevant background literature to support your writing.

**Citations and references need to be provided in Harvard format. The word count for the report should be about 2000-3000 words long. You need to include at least 12-15 academic citations to enable you to provide authoritative background literature (academic conference papers, journal papers, chapters from academic books) across the different sections to support your writing.**

**The format for Prototypes must be Axure files unless agreed with the lecturer otherwise. The submission as mobile Java Apps, database driven web applications or any other proprietary format that requires installation is not permissible and no points can be awarded for such prototypes.**

1. **Introduction**

Brief introduction to the coursework and the structure of your report.

As part of this assignment, I'll create a report and a working prototype for a novel interactive tool for skiers on slopes.

Skiers will be able to track and observe their skiing activities with the help of the product I offer, including statistics about their skiing activities, the routes they took, and the snow conditions, such as a weather forecast, at the mountain location they are currently at.

In addition, I create a proof of concept for how the system functions to see if consumers will find it appealing and useful.

Interactions between products/designs/services on one side and humans on the other should be as intuitive as conversations between two humans—and yet many products and services succeed to achieve this, especially with the exploding time of technology devices.

# Background

Brief definition of some key terms and how the work is situated in HCI.

* 1. Interaction Design Research

Provide an overview of your literature research on the topic of the project brief (e.g. HCI research and studies with similar products or contexts) to develop your conceptual design and your requirements. The chosen literature should be relevant for eliciting requirement for your prototype. Describe your main findings and clearly state what requirements were drawn from your findings.

**Interaction design** can be understood in simple (but not simplified) terms: it is the design of the interaction between users and products. Most often when people talk about interaction design, the products tend to be software products like apps or websites. The goal of interaction design is to create products that enable the user to achieve their objective(s) in the best way possible.

**2 Conceptual design** is the initial big picture or macro design. It shows us what problems the product will solve, how it will solve them, and what it will feel like as it is solving them.

- The conceptual design needs to be clear it provides what a product can do and what its intended use is. This is key when creating a product and without this, the process will encounter problems later down the line.

- Conceptual designs create a clear user interface that is easy to understand and interpret.

It helps to describe the roles of different users and their requirements in detail so that the project is better understood from the offset.

- The design help to carefully consider the user's points of view making the final results easier the achievement as well as current design trends and materials.

- Without a good conceptual design, the various processes involved in creating a product will become drawn out meaning more time and money will have to be funneled into the project to achieve the desired result. This process can be easily streamlined by using a good conceptual design as this will help prevent repetitive tasks.

The main part of conceptual design is define user requirements I applies these questions to answer for the requirements.

1. Define a concept: statement of what the application is all about. What is in the scope and what is not?

An interactivity tool for skiers was necessary for this project. Skiers need tools that allow them to track and monitor their skiing activities, as well as statistics about their skiing, the routes they traveled, and the snow conditions at the mountain site they are now at. These tools should also include a weather forecast. For the tool to work, those features are essential.

1. Describe the end user and their needs: List of user categories who would access the system along with what tasks can they do and what they can't.

Skiers are the project's primary user group. Skiers always have a pair of skis, some warm clothing, and gloves on their hands, so they require a tool that will be the most comfortable for them to use before, during, and after skiing, particularly since their two hands are always occupied with ski poles.

**In conclusion**, we discover various things that the user requires:

- A screen display or brighter must be adjusted to the outside environment so that the user can easily view the content on the device.

- The device's content must be well-designed and simple to understand.

- The screen can display a variety of facts, allowing users to quickly get the information they need even if the device is not opened.

- The user may easily interact, choose items on a touch screen, and some gesture-based interfaces are intuitive.

- The user can view their skiing statistics and track their historical activities.

**Practices**

People often prefer apps that provide multiple, powerful complications, because it gives them quick ways to view the data they care about, even when they don’t open the app.

Most watch faces can display at least one complication; some can display four or more.

Identify essential, dynamic content that people want to view at a glance. Although people can use a complication to quickly launch an app, the complication behavior they appreciate more is the display of relevant information that always feels up to date. A static complication that doesn’t display meaningful data may be less likely to remain in a prominent position on the watch face.

When creating complication content, generally use line widths of two points or greater. Thinner lines can be difficult to see at a glance, especially when the wearer is in motion. Use line weights that suit the size and complexity of the image.

Simple layouts allow users to focus on lesser things. Simple, decluttered designs without contrasting elements load quicker and are easier to grasp. If there are many elements, calls for action, and multiple content blocks, the essence of communication is lost. It is also important to incorporate enough white space within the design to reduce clutter. Simple designs that flow from top to bottom and left to right as the most recommended user experiences.

Having a simple layout design helps in effective communication in all areas, right from aiding email marketing strategies to creating memorable interfaces on apps and web pages

Color: Using one or two contrasting colors can reduce visual work by emphasizing important elements and improving scan speed, but overly complex color coding of data and controls increases cognitive load and memory work.

Warm, high-value, saturated colors emphasize information and make it pop

Dark, desaturated, cool colors cause information to recede. Any color contrast will draw attention, but reds, yellows, and oranges will generally do so

more effectively than purples, blues, and greens. However, avoid using one saturated color on top of another because it causes eyestrain. This is especially true with blue and red, which seem to vibrate, causing a condition known as chromostereopsis.

Red stimulates excitement and energy. The color of blood and stop signs, it is often associated with danger.

* 1. **Interaction Design Theory**

Brief discussion of relevant concepts and theory from the HCI field and how they will be applied in the coursework. This could include relevant background literature (e.g. in relation to cognitive psychology, interaction design theory), and different modes of interaction (e.g. voice, touch), types of interaction, design principles and design patterns. Discuss how this literature will inform your product, such as your requirements or design.

**Interaction design process**

**User-centered design(UCD)** is an iterative design process in which designers focus on the users and their demands throughout the design process. UCD design teams employ a combination of research and design methodologies to incorporate users throughout the design process in order to develop highly useable and accessible products for them.

**Goal-directed design (GDD)** is a research-based software-design method for anticipating how people will respond to a new or modified product, service, or system.[cite]Its fundamental premise is that the best way to design a successful product is to focus on achieving goals. Goal-Directed Design encompasses the design of a product’s behavior, visual form, and physical form. []

With the design processes I mentioned above, I found that goal-directed design (GDD) is appropriate for the project, by putting humans at the center of the product-development process through "user research" and other techniques that reveal people's reactions to an existing product to which they are exposed. Also, an iterative design process ensures that the product team is continually working to improve user experience; improvements are introduced gradually as the team acquires a better understanding of their target user.

**The principles of design** are the rules a designer must follow to create an effective and attractive composition. The fundamental principles of design are:

Emphasis: emphasis referring to the focal point of a design and the order of importance of each element within a design. Answer the question what is the first piece of information users needs to know?

Balance and Alignment: Balance gives a design its form and stability.Without balance, the user will be uncomfortable and irritated.

Contrast: Contrast creates space and distinctions between design elements. The background color must be significantly different from the color of the elements in order for them to work harmoniously and be readable.

Color: Color is a key design component because it helps connect on an emotional and subconscious level.

Proportion: Proportion refers to the visible size and weight of parts in a composition, as well as how they relate to one another. It is frequently beneficial to approach the design in portions rather than as a complete.

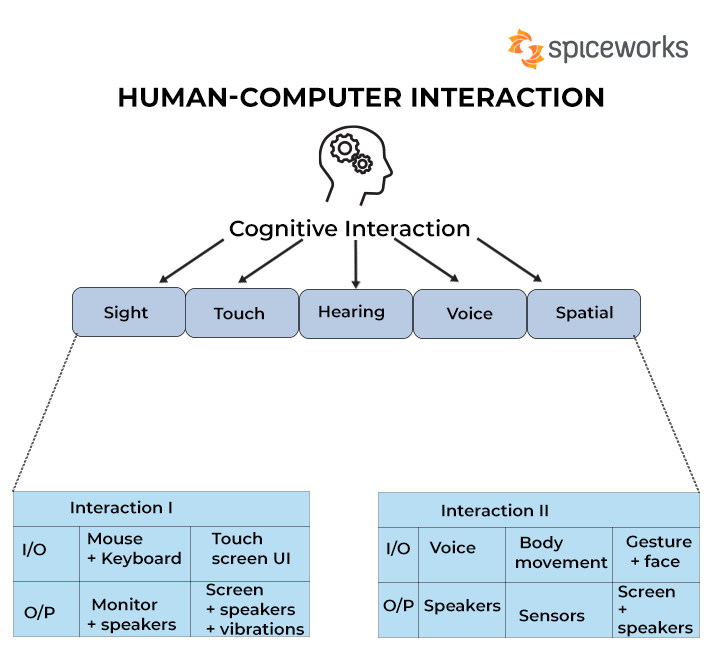
Movement: Movement is the control of the elements in a composition so that eye is directed from one to the next and the information is correctly delivered to the user.

White Space: Negative space, also known as white space, generates shape and can assist highlight the most crucial information in the design.

Therefore, I can apply those principles to have a good ux design, such as appropriately choosing the color and contrast of the device, which will have an advantage in display in outside conditions.

**Type of interaction**

The computer has become a great impact in our daily lives, and our interactions with computers have evolved over time. Computers and software are fundamentally supported by the various ways in which humans can communicate with one another in the real world.



These are types of interaction:

- Sight: We use our eyes to look at screens or other user interfaces and content to make decisions about how to finish out a task.

- Touch: We employ your hands to operate a user interface that includes buttons, keyboards, -haptic (vibrational) feedback, and more from our computer gadgets.

- Hearing: Sound is utilized as feedback for usage in both content (music/video) and to signify activities and proprietary sounds of a user interface.

- Voice: We use our voices to transmit activities, emotions, and commands. Voice interfaces understand these commands and train their users to utilize certain commands to complete tasks.

- Spatial: We move through space in the real world as well as in our computer systems. Interfaces can respond to macro-movements (place on the planet) as well as micro-movements (waving hands, thumbs up, etc.) to operate an interface.

In conclusion, using those keys, we can concentrate on some aspects of the interface that will improve the overall user interaction experience. Interaction type (touch, click, gesture, or speech), screen resolution, display size, and color contrast must be considered. We should modify these based on the needs and requirements of the user. For example, if skiers are usually skiing outside, we must consider how the device will appear in different lighting conditions (sunny or rainy), or the font size should be appropriately adjusted so that the user can read it on the device.

# Design Process

* 1. Conceptual Design

Present your proposed design solution. You are only asked to describe the product and interactions, and not the technical attributes of the product. You can include some visualisations to give the reader a rough idea what the product and overall solution will look like. However, this does not have to be very detailed. Show how your work has been informed by the outcomes from your writings on Interaction Design Research and Theory in the previous section. Demonstrate in your proposed solution how the requirements from the literature have been met.

1. Find the users’ needs/wants—It’s easy to assume you know what users want/need and their relevant contexts. Discover their real requirements:

- Observe people.

- Interview people.

- Examine existing solutions

1. Do analysis to sort and order your findings so they make sense. This may be through a:

- Narrative/story of how someone uses a system.

- Task analysis, breaking down a user’s steps/sub-steps.

1. Design a potential solution according to design guidelines and fundamental design principles (e.g., giving appropriate feedback for users’ actions). Use the best techniques to match how users will interact with it in terms of, for example, navigation.
2. Start prototyping—Give users an idea of what the product will look like and let them test it, and/or give it to experts to evaluate its effectiveness using heuristics.
3. Implement and deploy what you have built.
4. **Project Planning**

I'll have a basic idea of how the project will be structured and the outcomes we may expect. It is critical to identify the main stakeholders, decide the project objectives based on their feedback, and write a plan.

1. **Research**
2. **Modeling**
3. **Requirement Definition**
4. **Framework Definition**
5. **Detailed Design**
6. **Implementation Support**
   1. Five Dimension of Interaction Design

Include a discussion how the concept of the five dimensions of interaction design (by Gillian Crampton Smith and Kevin Silver) has been integrated in your design and how it can be evidenced by the interactions in your prototype.

**The 5 dimensions of interaction design** is a useful model to understand what interaction design involves.

1D: Words

Words, particularly those used in interactions, such as button labels. I'll go with significant and easy-to-understand words. They should provide information to users, but not so much that the user is overwhelmed. Text font and font size must also be considered. To have an optimized content view, we need to have text in the right spot.

2D: Visual representations

This refers to graphical elements like as images, typography, and icons with which users interact. These are typically used to supplement the words used to communicate information to consumers. In this scenario, we should choose an icon that is understandable and familiar to users, particularly skiers, to make it easier to recognize.

3D: Physical objects or space

Through what physical objects do users interact with the product?

In this scenario, a smartwatch is appropriate for skiers. A smartphone is also considered, however skiers cannot track information with a smartphone while skiing with two hands holding ski poles. They can do this with a smartwatch by making a wrist gesture or even use their voice.

4D: Time

While this dimension sounds a little abstract, it mostly refers to media that changes with time (animation, videos, sounds). Motion and sounds play a crucial role in giving visual and audio feedback to users’ interactions. We can apply animation in a success message with a great sound while skiers complete a route. That would provide the user a positive impression of the encounter. Another application is the progress bar animation, which shows the progression of a skiing activity.

5D: Behaviour

How do users perform actions on the device? How do users operate the product? Action, reactions, operations, and presentations... The actual behavior of our application such as displaying recorded activities with summary statistics, weather forecast, or swiping actions.

# Prototype

Briefly introduce and discuss your final mid-level prototype and describe how the design is informed by the research that has been carried out and the concepts in the previous sections. Include screenshots of the final prototype and provide evidence of your design process, such as the iterations made. It is important that you can demonstrate how the design progressed over time and that you can discuss the purpose of your prototype. **A series of static images is not a mid-fidelity prototype, your submitted Axure prototype needs to include some interactivity that can be experienced.**

There need to be clear links between coursework report and the corresponding prototype so that design decisions are well documented. There needs to be evidence for the effective and successful application of Interaction Design principles to create a prototype that can be used to test core concepts of your design and that is suitable as a learning tool for researchers and designers.

# Research Study

A presentation of a detailed concept for an empirical research study that uses your prototype to test at least one assumption that you have made when designing your prototype. In this step you need to present the design of a research study including the question(s) or hypothesis that your research study attempts to answer. What hypothesis or research question are you investigating? Who are the participants of your study and how will you find participants? How will the study be run and how will you analyse the data? **You are not asked to run the study but only to design the necessary research instruments so that someone else such as a usability researcher could run the study using your materials and the prototype.** You need to create all necessary instruments and documentation (e.g. a questionnaire) that is required to run the study. This documentation should be included in an Appendix.

# Conclusion

Provide critical reflections on the work that has been completed. What are some of the limitations and constraints of the work? What could have been improved? What would be potential next steps? Go beyond just repeating what has already been said elsewhere in the report.

# References

Make sure all your references and in-text citation are correctly formatted using Harvard format. If you are unsure about the Harvard format, use suitable tutorials and guidelines provided by the UoG library and the guidance given for your final year project.

<https://www.interaction-design.org/literature/article/what-is-interaction-design>

<https://www.interaction-design.org/literature/topics/user-centered-design>

<https://www.spiceworks.com/tech/artificial-intelligence/articles/what-is-hci/(img)>

<https://uxdesign.cc/a-comprehensive-list-of-human-computer-interactions-d72eaca2c0df>

<https://www.adobe.com/express/learn/blog/8-basic-design-principles-to-help-you-create-better-graphics>

Cooper, A., 1999. The inmates are running the asylum. In Software-Ergonomie’99 (pp. 17-17). Vieweg+ Teubner Verlag, Wiesbaden.