Week 1 - Introduction to HCI

Learning Objectives

- [x] What is Human-Computer Interaction?
- [x] User Centered Design - High Level Introduction
- [x] Good Design - Drinks Can
- [x] Questionnaire Common Mistakes

What is Human-Computer Interaction?

We can describe *Human-Computer Interaction* as the field of discipline which focuses on **understanding the interaction between human and technology** and the **major phenomena around them**.

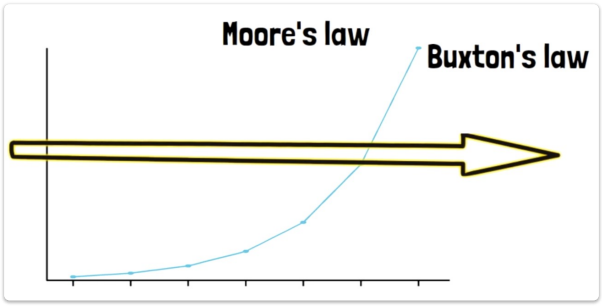
- We concern ourselves with the design, evaluation, and implementations of these technologies.

HCI helps to design interactions which addresses to real life problems. These can be a range of making life easier to making processes much more efficient.

Humans are an important factor in HCI, we look at who is interacting with these technologies.

- Are they healthy, active, have disabilities, how they learn, how they see things, and all sorts of factors that can influence their abilities in using technologies and how HCI aims to adjust to their needs.
  - **Computers** can come in all shape of forms (mobile, wearable, gaming, embedded systems) which aims to do a different task base on their needs!

Throughout the years, we see that for every 18 months (or so) the *transistor density doubles*. This is what we know as **Moore's Law**. But because of this, the complexity of interfaces ***also*** doubles, known as **Buxton's Law**.

- 

  - Human abilities remain the same through the years (indicated by the arrow), which leads to the problem when they interact with very complex interfaces.

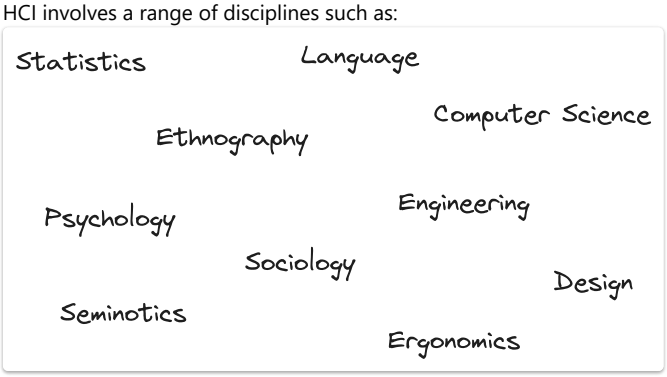
Interaction looks to *understand the user's goals in the situation that they find themselves in.*

- From this, we look to design a solution for this interaction so that both human and computer are satisfied with the interaction.

By definition, the ACM in Nov. 2015 says:

> **Human-Computer Interaction**
>
> "Human-computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them."

HCI involves a range of disciplines such as:



- All of which plays an important understanding to human interaction.

As the world is changing and new technologies begin to appear in everyday life, so does Human-Computer Interaction

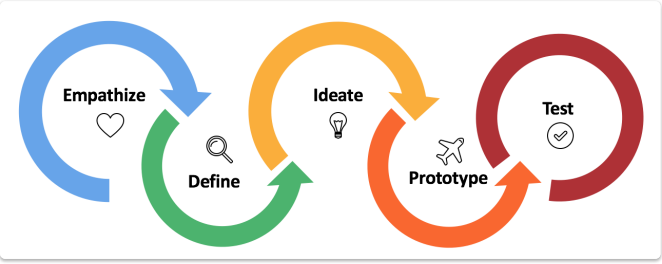
This module aims to cover the following:

1. Understanding people to guide design
2. The Designing Process
3. Methods, Tools, and Techniques in HCI
4. Examples of research
    - Methods in practice, relevant human functions to design, understanding engagement with technology

We look to understand people (psychology and physical interaction), technology (actions and limitations that influence design), interaction (how human perceive interactions), and design (principles and practice of effective designs).

User Centered Design - High Level Introduction

There are many different models when designing. The following one is a simple and clearest to understand and use in practice:



1. Empathize - Understand what is going on in the situation.
    - Find what sort of problems that the user faces in the situation, see what is available or unavailable, what is needing to be done, what is lacking, or even what is hard to do.
        - Put yourself in the user's shoes!
2. Define - Focus on the problem and the key bits that needs to be solved
3. Ideate - Come up with ideas, concepts, or solutions that we can use to design
4. Prototype - Test small parts of the solution or the entire thing which might take some time to do
5. Test - Provide your solution to the users and test if the design achieves what we want.

We would need to go back to specific stages in this model, but overall this takes in mind that the user is our priority, and we iteratively go through each part to better our design.

UCD is a term used by the Software Industry as a practice for those *who care about the users that use their products*. This provides a process to enhance user satisfaction by *improving* the product to better suit their abilities and simplifying a complex interface.

- This employs investigative approaches, generative methods and tools, constructive and evaluative approaches
    - This helps to develop an understanding of user needs and therefore a potential solution.

Good Design - Drinks Can

A example of how HCI, in a non-technological sense, is a simple drink can that we use to drink our favourite beverages.

It contains clear and easy to read labels, portable, use of materials to provide longevity, keeps it cool, and keeps contents away from outside stuff. An indentation at the top and bottom to stack them. Lightweight, concave surfaces providing strong stability against pressure.

- There is plenty of stuff we can see that is put into such a simple design!

Designing something keeps in mind a lot of *different factors*, like the can above. We want interactive technology to involve a lot of different thoughts in its design so that we have interactions that suit the user's needs and satisfaction.

Questionnaire Common Mistakes

Questionnaire is one of many ways we can collect information about a situations/problems, and helps to create a general idea about it. However, there are 12 common mistakes when we do them, which can lead to situations where we may not get what we wanted and guide designs with them.

1. Leading questions
   - These type of questions tends to lead the path on how the questionnaires go, we don't want to stray from the main objectives and dawdle into irrelevant and unnecessary paths.
2. Assumptive/loaded
   - Remember that the user may or may not have the experiences that you expected. Some questions would require qualifying information for them to answer, so it is not best to assume stuff about them.
3. Multi-part/double-barrelled
   - Some questions would have two parts to them which confuses the user, keep them separated.
4. Double negatives
   - Double negatives like saying "not unclean" is confusing, and the user might not be able to understand the meaning of the question.
5. Jargon
   - The user may not know what words are or means, so keep it clear and understandable for everyone.
6. Mismatched scales
   - If you ask the user to rate something on a scale (like from 1 to 10), make sure you are clear about the values they are to provide.
     - 1 being terrible and 5 being excellent.
   - Don't be biased.
7. Multiple/missing answers
   - Overlapping answers can be very confusing to the user, keep it clear and concise. Keep in mind what options you are providing if they have the same meaning or concepts.
   - Make sure that you address to possible answers and not miss them out (like missing an age range)
8. Random
   - These questions have no relevancy to the main topic of the questionnaire nor should be addressed. You don't want to waste time and not get incorrect ideas.
9. Irrelevant
   - Remember about GDPR, is relevant to your questionnaire? You do not want to keep things that have no meaning for the questionnaire topics.
10. Inconsistent
    - You will want to keep your design consistent throughout the questionnaire (like for scales having bad on side and the other side being good). Inconsistency can lead to confusion when the user interacts with the questionnaire.
      - Font, colour, device format, etc. plays an important part in gaining user's attention and provide honest answer.
11. Unclear/multiple interpretations
    - Users may interpret a question differently to what you say. Keeping them clear and concise better their understanding, as well as providing information if they do not understand.
12. Won't get honest answer
    - You may not always get the answer you want as some questions may be biased.