# The History of Human Computer Interaction (HCI)

## **How has human and computer interaction changed over time since the first use of computing in the 1960’s and how has the ease of the user interactions progressed.**

Human computer interaction is a simple to understand topic that covers a wide variety of ideas in relation to how we as humans make use of computers. It focuses on the interfaces that the human sees when they proceed to accomplish a task on the computer. At its heart, it is the epicentre of computer science as it is important to keep the user at the forefront of the technologies that we build. Over time, how people interact with computers has evolved dramatically, from the use of large desktops to the small, hand-held mobile phones use in modern times now.

“The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it” (Weiser, 1991). Elements of previous computers are still found in modern day computers in a way we sometimes do not even realise. In this essay, I will discuss how human interactions with computers has changed, from the usability to the progression of technology, allowing more people access to computers. I will talk about how computers have been interacted with in the past and contrast that with the use of them now, in terms of their user-friendliness and receptiveness to the users' needs. This analysis will take human-computer interaction related usability factors into consideration to better understand the progression of human computer interaction through history.

Before looking into the different computing eras which helped to define human computer interaction, it is also important to mention the different basic computer interaction and application types that were innovated prior to the commercial rollout of computers. Douglas Engelbart began developing the computer mouse in the early 1960’s, while he was researching the interactions between humans and computers. Bill English then built the first computer mouse prototype in 1964 (History of the First Computer Mouse - SRI International, n.d.). The mouse was a new way for people to make use of a computer in a more interactive way, giving the feeling of having more control. On the visual side of things, the first computer monitors to be used was on the Xerox Alto computer in 1973. Computer monitors have developed from being very large and simplistic with very little in the way of colour to being very slim today with even more interactive features such as being touch screen and full of colour, which is appealing to the eye for the user.

Various types of software were proposed and developed during this time as well, such as drawing programmes, text editing, spreadsheets, hypertext, computer aided design and video games. These were all the different ideas innovators had that would eventually be implemented onto computers as ways for humans to interact with them, whereas previous to these developments, computers were not very interactive, as is discussed within this essay. They would provide usability to the computers and make them widely approachable for a wider range of consumers.

Computing history can be broken down into four different eras (Harper, 2008):

* 1960’s - Mainframe Era
* 1980’s - Personal Computer Era
* 2000’s - Mobile Era
* 2020 and beyond – Ubiquity Era

If we start with the Mainframe era, human computer interaction as an idea did not even exist as of then. Very few people were trained to use the computers of this time. While mainframes existed before the 1960’s, they were not widely used until then when IBM began to produce them for business and scientific needs. The mainframe established three professions: operation, management and programming. In terms of HCI, there was not a large amount of interaction with these computers in the way that we know it now in the 21st century. “Few programmers were direct users. Most prepared flowcharts and wrote programs on paper forms. Keypunch operators then punched the program instructions onto cards. These were sent to computer centres for computer operators to load and run. Printouts and other output were picked up later. Programmers might use computers directly when they could, but outside of research centres, the cost generally dictated this more efficient division of labour” (Grudin. 2008). Because of how little the programmer got to interact with the mainframe computers, this drove the development of the personal computer era.

The personal computer first hit the market in 1977, and throughout the 1980’s it was common to own one. It was during this time that human computer interaction came into consideration with Apple’s Lisa being the first computer to feature a graphical user interface with drop down menus and icons. Human computer interaction was mainly focused on creating systems that were easy to learn and to use (Xiao, 2017). The personal computer could be used for a wider variety of things in comparison to the mainframe, such as gaming, office and personal work and other business-related software. This era defined design techniques that were developed that are still used to this day, one being usability. It became of great importance that usability testing would be carried out to ensure that a consumer would have no problems using the software or system. Usability is concerned with human behaviour. To contrast this era with the prior, computers became widely accessible and usable for everyone from programmers to families. It got designers thinking more about interaction design for generations to come.

While they existed throughout the 1980’s and 1990’s, the 2000’s saw the development of mobile devices with human computer interaction design features really take off. The mobile era took elements from previous designs and enhanced them further. Laptops had touchpads now instead of a separate computer mouse allowing for more gestures to be used from the user to interact with the computer. 3G technology began to emerge in the 2000’s, which allowed people access to mobile broadband, rather than having to be connected to the internet via a computer. The biggest and most impactful development during this time was the smartphone. The smartphone saw many advancements for human computer interaction with different gestures and features being explored and implemented such as face detection, gesture-based interaction (keyboard on phone for typing, 3d touch on the iPhone), and speech recognition. The smartphone made mobile computing very accessible and efficient as it means people can do the same thing they would want to on a computer without having to own one thanks to these interactions. The smartphone is a user-friendly way for a human to interact with a computer.

In the modern day of 2020 and beyond, human computer interaction has changed drastically since the 2000’s with the design and development of new technologies. Ubiquitous computing has taken off. Users can interact with computers now in many different forms. In 2015, Apple released the Apple Watch, a wearable device that is designed to be worn. It provides the user with a personalised user interface that is responsive and lightweight. Gestures allow the user to have quick interactions, such as tapping, tap and hold, drag and swipe. It allows people to have their smartphone with them at all times through the means of a watch. Google has also developed the Google Glass, which is a brand of smart glasses. It is a hands-free device created to provide “hands-on workers and professionals with glanceable, voice-activated assistance that is designed to be worn all day with its comfortable, lightweight profile.” (Tech Specs – Glass, n.d.) It has a multi-touch gesture touch pad which users interact with to be presented the screen through the glasses. It is an innovative way for humans to interact with computers which is small and lightweight. These among other devices have caused the growth of cognitive engagement with computers and there is no doubt that in the future, we will see more and more sensory based developments in human computer interaction.

To conclude, it is clear by looking at the history of human computer interaction that it has come a long way. The progression and development of computers has overtime made them more accessible to everyone, with usability testing being at the forefront of system development nowadays in contrast with that of the mainframe era. It is evident that the innovations made since then in human computer interaction has shaped technology as it is today. We now consider interaction design, usability, design and prototyping, requirements gathering and user experience. These ideas are put at the forefront of development. The ease of user interactions has allowed for virtually anyone to use a computer, with the interactions on all devices being so universal. Gestures can be translated from one device to another seamlessly. To return to the previous quote which said that the most profound technologies are those that disappear, it is evident that while elements of computing from the personal computer era may not exist in the modern day, they have sown themselves into the technology that is used today, thus not totally disappearing. It is exciting to see where the development of human computer interaction will be in the next sixty years when you contrast it with the previous sixty years before today and where it will take us beyond my time.

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