

Lucia Dossin - Thesis

Chapter One

This chapter will contain descriptions of each element in the interaction and will confront those definitions to the statements terms. By doing this, I intend to prepare the reader for my arguments in the next chapter.

In order to discuss the terminology around Human-Computer Interaction in the context of User Interface Design and the ongoing trend to 'upgrade' those terms, it seems wise to first define the terms which are being discussed: computer, user and interface. The setting in use for this research is: Users are the human beings which are operating the Computers (giving input, sending commands, retrieving output to/from the computer) through an Interface. Static, dictionary-like definitions of the terms are certainly possible, but these usually do not explicit the historical layers that involve the terms and its meanings - which is essentially important in this research. Within the interaction between humans and computers, each term of this interaction (User, Computer, Interface) is a component of a relationship. Both the components and the relationship have changed over time.

The principle of the modern computer was described in 1937 by Alan Turing (On Computable Numbers, London Mathematical Society) but the use of tools for aiding computing and calculation dates way back. Even people could be called computers, when performing the task of computing and calculating. [This episode](#) - involving Radhanath Sickdha being promoted to 'chief computer' due to his good work in discovering the highest mountain in the world, in 1852, after 4 years of computing mathematical data - is a good example of change of meaning over time and the importance of the time frame regarding these definitions. (link retrieved at Hodges, Andrew - Alan Turing Internet Scrapbook, <http://www.turing.org.uk/scrapbook/computer.html> - accessed Feb 18, 2015) In the modern configuration, inaugurated by Turing, computer is a machine, not a person.

Computer is a machine as big as a medium-sized apartment, which uses punched cards as data input and output, in which the manipulation of switches and cables works as programs, which aim at solving military problems (more specifically, fire-control systems and missile trajectory calculations). This was the definition of a computer in the late 40's. It contains not only the description of the machine, but also of how it was operated, by whom and for whom: a machine like this could not be produced on a large scale - due to its cost, its size and its need for specialized work to operate it, it was designed and built for government use.

Technological research, experiments and developments kept changing the numbers (size, speed, price) which were used when describing a computer. With the changes in these numbers, changes in the User and in the interaction Interface came along. The possibility of making a smaller machine for a smaller price put computers inside companies. In the early 50's, IBM was the company behind the first mass-produced computer: the IBM650 - also known as the Magnetic Drum Machine. Its Manual contains not only descriptive information, but also a quite detailed explanation on how to program for the machine. Contrary to its

predecessors, which were aimed mostly at large government agencies, the Magnetic Drum Machine was designed to be affordable and easy to use. It was cheap (and discounts for universities were possible), small (would fit in one room) and user-friendly (programmed in decimal rather than in binary). (Art Miller <http://www.mta.ca/~amiller/ibm650/ibm650.htm>, Columbia University <http://www.columbia.edu/cu/computinghistory/650.html>, accessed Feb 18, 2015)

Color displays and Graphical User Interfaces (GUI) were the next big features made possible by technological development and incorporated into computers. These features, available at the right market price since around the early 80's, brought with themselves the possibility of selling computers to 'ordinary' people. This is the moment when the computer began to look like the computer as we define it today: the personal computer, operated by an User who is an ordinary person, through a graphical Interface, used for office or personal work (writing letters, laying out an announcement). But before we go on, there are still a few details regarding the rise of the GUI that are worth mentioning, as they indicate in which context the Graphical User Interface was created.

Alan Kay, computer scientist whose work (based on works by others but mainly Douglas Engelbart, Seymour Papert and Jean Piaget) conceived this new approach towards Human-Computer Interaction - the GUI - explains in 'User Interface: A Personal View' (2001, W.W. Norton) that his understanding of the computer as a medium rather than as a tool meant that Users should be able to read and write it. "The ability to 'read' a medium means you can access materials and tools created by others. The ability to 'write' in a medium means you can generate materials and tools for others. You must have both to be literate." (p. 125) His proposal for DynaBook (<http://www.mpro.de/diplom/gui/Kay72a.pdf>, accessed Feb 28, 2015), the portable computer in the size of a book, designed 'for children of all ages', puts the educational value of computers at a central spot and regards its user as 'an active agent, a creator and explorer, [...] far more capable intellectually than is generally supposed'. (p. 4) It is a document that shows the User being regarded as intelligent, active and capable. Therefore, the Graphical User Interface is seen as a way to enhance knowledge - not simply a shortcut to a task. Even though it should facilitate tasks by simplification, it should also allow complexity and encourage literacy.

In an interview to the Time Magazine (<http://techland.time.com/2013/04/02/an-interview-with-computing-pioneer-alan-kay/>, accessed Feb 28, 2015), Kay acknowledges that in a consumer society, there is the desire to have no learning curves. 'This tends to result in very dumbed-down products that are easy to get started on, but are generally worthless and/or debilitating. We can contrast this with technologies that do have learning curves, but pay off well and allow users to become experts (for example, musical instruments, writing, bicycles, etc. and to a lesser extent automobiles).' (Leave this paragraph for another chapter?)

Going back to our timeline, even though very little has changed in the realm of GUI's (except for some minor make up, such as making icons glossier and providing animated transition effects) after the mid 90's when the GUI was revamped through the possibility of overlapping windows, the 'evolution' of the personal computer did not cease at the original advent of GUI's. About 20 years after those improvements, touch screens were available at market

price and would be used in devices so small they would fit one's pocket.

So, in 2007, Apple brought the iPhone to the market, consolidating a new set of definitions for the triangle Computer - User - Interface. While the Interface still looks strongly similar to the GUI from the mid 80's, the definitions of Computer and User have undergone a significant change. The computer is portable (very light), mass-produced and often permanently connected to the internet - therefore extensively used for communication and other everyday activities, such as checking train departure schedules. It can also be used as a phone, a video-recorder/player and a photo camera.

Apple's approach regarding the computer was based on Steve Jobs' definition of it, since Apple II was being designed: 'the personal computer should be like an appliance. With the Apple II and then, more notably, the Macintosh in 1984, Apple pioneered the practice of creating machines that users were not supposed to open and fiddle with their inwards.' (Isaacson, Walter, *The Innovators*, 2014, p. 252/253) But this approach does not refer only to hardware. Apple's position regarding the use of software in the iPhone is also one of centralized control. The User to which this computer is designed is regarded as not intelligent, passive and unable, when we compare this User to the one Kay was designing for. The User should not explore the machine, the User should not be curious, the User should not use the Computer in ways and for purposes that don't belong to the Computer's original design - even when it does not involve a strictly technical question (the prohibition of pornographic content and the need to have Apple's Store approval for an App installation are clear examples).

The iPhone was followed by the iPad, a few years later. In the iPad, the same strategy was implemented - the one of an appliance computer. Let me open parenthesis here and say that this is true specially when it comes to the new computer, the 'mobile devices' - smartphones and tablets. Desktop/laptop computers are still relatively accessible to the User. Also, this new computer paradigm is not exclusive to Apple. Apple pioneered, set the model. Others followed. Android and Windows Phone also have for their mobile devices their equivalent to the Apple Store, the central control for Apps authorization and installation. This shift alone is already an indicator of a significant change in the identity of the User: from User to Consumer, from *installing programs* to *shopping apps*. In his paper 'Sandbox Culture' (date, publisher), Aymeric Mansoux describes how this shift actually goes beyond a mere terminology question. By running in an Android system a few UNIX commands that inform what your username is, which directory is your home and which groups you, as an User, belongs to, he shows that the User is not an User, but an App (p. 18). He calls this environment a Sandbox and explains why the term jailbreaking, when referring to the act of overriding Apple's caged system, is actually very appropriate. (In Android, there are differences in the way these restrictions are handled and the reconquest of the lost privileges is called rooting.)

TO DO -> Write about the importance of the GUI going through change in this process and the role of user friendliness in communicating with the User.

In iPad's trailer, Apple states that technology should remain invisible and that the iPad is a magical pane of glass, ready to make all dreams come true. Don Norman is on a crusade to

get rid of the *word* User. And Samsung's designer, Golden Krishna, wants the Interface to literally disappear. The research on the definitions of Computer, User and Interface brought up another outcome, instead: technology is not invisible, but rather controlled, locked up and inaccessible. The device is not magical, but a machine with limitations and control of many kinds to assure a low margin of 'failure' or the need of intervention by the User. The User has less rights and privileges than before and is far from being treated as 'people': the User is an App. The Interface still *looks* quite similar to the 80's/90's GUI, but its importance has changed.