college CD

# User interface design (C1U)

Class 1

# User interface design

## What is a user interface?

A user interface (UI) is a visual element or a group of visual elements organized so a user can operate and/or interact with a machine or a system whether it is mechanical, electronic or computerized.

A very simple interface example would be a light switch indicating how a light should be turned on or off.

Although, in the case of a light switch, an interface is not absolutely essential (user can see if the light is on or off), more complex systems would be difficult if not impossible to operate without indications. Imagine a big machine covered with many similar buttons and no indications.

A more complex although still simple interface, would be one of a basic radio. It tells the user how to power it on and off, how to choose a band (am/fm) and a channel, and how to adjust the volume.

The computerized system's interface (application or web site) has the same purpose : allow user to do various tasks.

As you will soon discover, it is not enough for an interface to be beautiful. Before anything else, it must be efficient.

## Designing user interfaces?

In order to produce efficient user interfaces, the minimal requirement is to understand the basic concepts of computer-human or human-software interaction processes.

The communication between a system is generally based on request-answer model. The interface must then allow user to make requests so the computer can perform actions to supply an answer that will then be evaluated by the user.

It is important for an interface to be produced with its user in mind (for instance, using the same language) so the user may understand how to complete its tasks. But, the user also has to adapt to the interface, to learn how to use it. On some systems, it can be quite difficult.

The user interface designer will have to find ways for the interface to be as easy as possible to be understood and used.



**User intention**

**User request**

**Computer action**

**Computer answer**

**Evaluation of the answer**

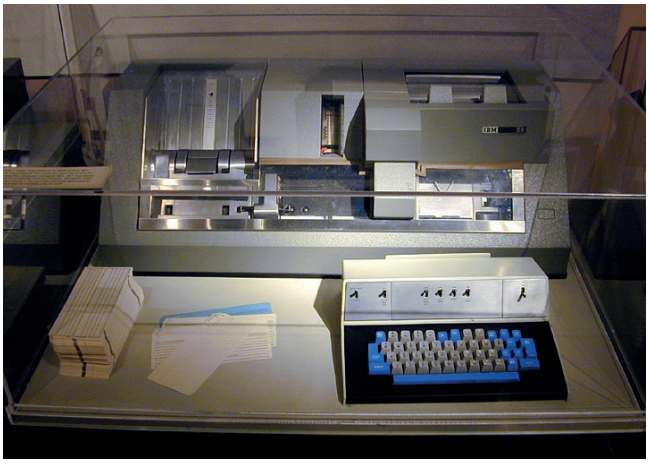
# Historical overview of human-computer interaction

## The first computers (1945)

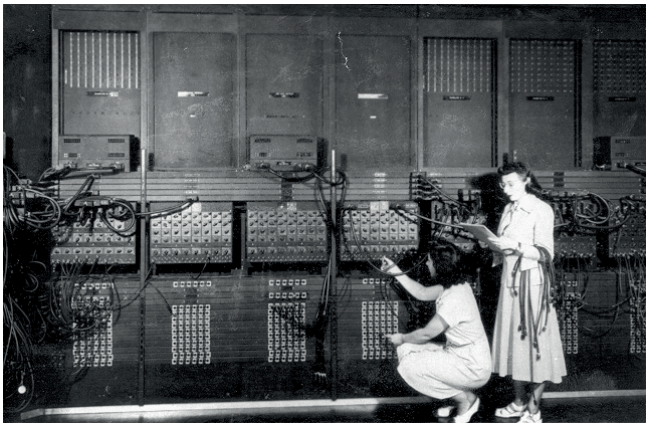
The first computer used what is called a batch interface.

The user interacted with the computer feeding it with punch cards or paper tape. There was no real-time answers and it could take sometimes many days before getting an answer.

There were no screens to see or evaluate the computer answers and changing function (changing the computer's logic) needed to rewire the computer for the new type of requests using a plug-board.



It is only in 1957, after the invention of the television, that screens would finally be used, making it possible to the user to find errors earlier in the process and insure this way a better quality end data.



## Command-line interface (1969 until now)

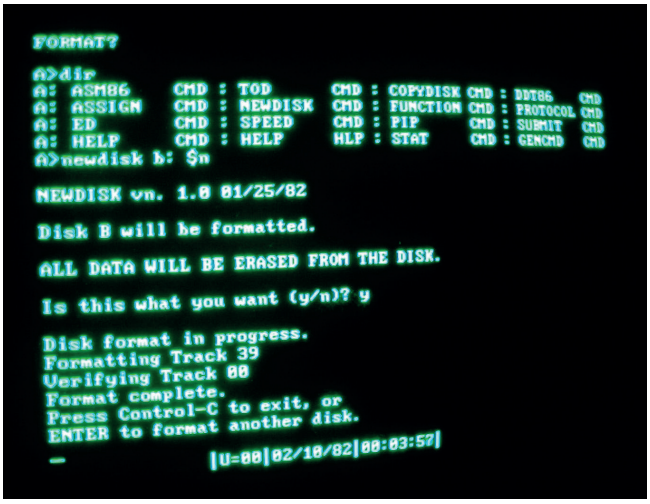
The command line interface evolved from batch monitors. The delays for treating requests then went from days to minutes and seconds.

The result of the requests (the computer answer) showed on screen so it was possible to evaluate the results before outputting them.

The text-screen output rapidly evolved to a visual screen display.

In 1985, IBM creates the SAA user interface (text based). This is the beginning of Microsoft. Various interface will be created until the invention of DOS and then Windows.

Standards were then established : pull-down menu from the top of the interface, status bar at the bottom, short-cut keys, etc. This made learning and using softwares a lot faster.

## Graphical user interface (1968 until now)

Visual interface started emerging quite early although they were far from what we now use. In the example beside, you can see an early graphical interface.

In 1968, Douglas Engelbart demonstrated NLS, a system using mouse, pointers, hypertext, and multiple windows.

In 1970, Xerox Palo Alto Research Center develops the WIMP paradigm which included windows, icons, menus, and pointers. It will go out of commerce in 1973 due to enormous expenses, poor user interface and the fact that there were not enough programs available.

In 1979, Steve Jobs and Apple engineers develop GUI (Graphical user interface). It will be popularize in 1984.

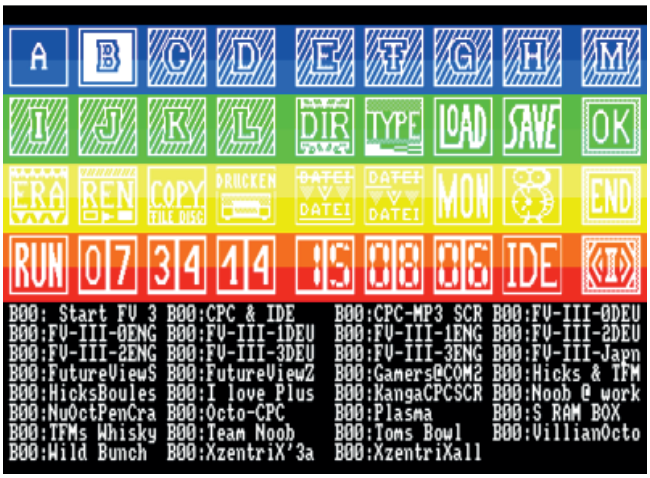
In 1981, Xerox Star focuses on WYSIWYG which will also be a commercial failure. 25 000 units were sold at a price of 16 000$ each. On top of a very bad marketing, it would take the system several minutes to save a file and couple of hours to recover from a computer crash.

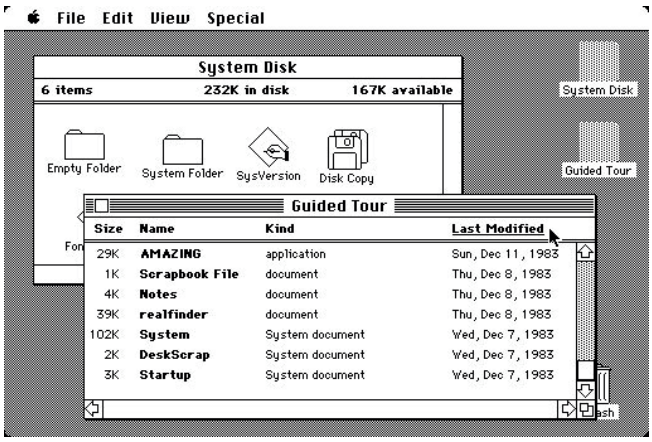
In 1984, MIT release the X Window System hardware-independent platform and networking protocol for developing GUIs on UNIX-like systems.

In 1985, Windows 1.0 is released using DOS interface. There were no overlapping windows, it would use tiled windows instead. Microsoft and IBM work on OS/2 that would eventually replace DOS and Windows.

In 1987, Windows 2 is released, using resizable windows, keyboard ans mouse enhancements. The same year, Apple releases Macintosh II, the first full-color Mac.

In 1988, OS/2 1.10 Standard Edition (SE) is released. The GUI written by Microsoft looks a lot like Windows 2.




# Common components of a user interface

## Functional and communicational aspects

A web site interface serves many functions and targets many objectives.

First of all, it identifies the company, the product or the service the web site has been developed for. That is why the logo is usually the first element to be presented on a web page.

Following the logo, a navigation is usually presented so the user can choose from different information segments available throughout the web site.

The content of the web site and of the different section is often presented so users know where to find what they are looking for. More and more web site will also present functionalities such as online shopping or reservations.

## Design aspect

The logo identifies the company or brand, but the web site design by itself should also represent it.

The web site is usually designed based on the corporate image, using the same style and colors used in the enterprise marketing activities.

The design should be created with the user in mind in order for the visitors to feel concerned about the nature of content, of the offer.

The style and the quality of the design should equal or overpass those of the competition and importance should be given to efficiency using cognitive ergonomics principles.