What Interfaces Mean: A History and Sociology of Computer Windows

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ABSTRACT
This poster presents a cursory look at the history of windows in Graphical User Interfaces. It examines the controversy between tiling and overlapping window managers and explains that controversy's sociological importance: windows are control devices, enabling their users to manage their activity and attention. It then explores a few possible reasons for the relative disappearance of windowing in recent computing devices. It concludes with a recapitulative typology.

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INTRODUCTION

The social sciences have long studied technology—how innovation happens and how the frontiers between the political, the scientific and the technical evolve (or even blur) during this process [11], how sociotechnical systems (understood as the socially authorized way to formulate and solve technical problems) establish themselves, how users and technology adapt to each other [1]. Yet, Graphical User Interfaces (GUI) have never been subject to an in-depth sociological and historical analysis; strangely enough, given how long they have been around, how pervasive they are and how important and influential they can be to our daily life and work. Only the Cultural Studies [8] and the Media Studies [14, 3, 5] communities have given real thought to the matter (and ongoing programs such as the Software Studies initiative look very promising).

I intend to develop a historical and sociological interpretation of the **computer window**, by studying controversies opened by research and interfaces both past and present, questioning the choices and the values [5] behind them. As much as possible, such a study will be confronted direct observations of users, or accounts of such observations. Such an endeavor would benefit both the engineering and the social sciences communities, expanding the social scientists' area of study, bringing more reflexivity to the engineers and designers, hopefully helping them build better interfaces—and helping them build a critical understanding of all the possible meanings of *better*. We know what windows are, and how they work. I propose, in this poster, to draw a brief historical account of why they came to be and what they mean to their users.

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THE FIRST WINDOWS

A Pictorial Metaphor

The term "window", originally designating an architectural feature, has a long history of metaphorical uses. The most famous one comes from the Italian Renaissance painter Leon Battista Alberti, who compared the painting to an open window [5]. There are two complementary ways of understanding this statement: the window as an opening *on* something, each painting displaying a new world; or the window as a frame, bounding each depicted world or experience to a particular point of view and size, thereby turning it into a portable physical object. Both these interpretations are relevant to computer windows.

Tools for the Thinker, Papers for the Worker

Windows evolved out of the works of pioneers like Sutherland, Engelbart and Kay. Kay's 1969 thesis [9] is one of the first documents theorizing the use and meaning of a windowed screen. Kay presents the computer as a machine providing "tools in which the 'thinker' can describe his own solutions"—computers don't think, but they might help us think better. To this purpose, windows allow the user to control the flow and organization of thought through a spatial representation. Windows are the visual representation of the process of abstraction. They abstract the data from the physical screen, creating as many sub screens as necessary for the complex and contrasted expression of a given thought process. They appear as rectangles on the device's screen, but the system considers them as viewports on very large virtual screens. Effectively, they abstract away the physical characteristics of the screen. They are both a *window on* something, opening on what Kay calls "virtual screens", and a framing of the content of the said virtual areas. The user has control over the framing operation, resizing, moving and reordering the windows at will. Indeed, windows are about giving users more control so they can escape each process' flow (as exemplified by a terminal output, which blocks further user interaction until it ends),

therefore seeing and doing many things at once. They are an elegant solution to the compound problems of small screens, slow computers and complex humans.

Kay's initial intuition of tools for the thinker was challenged at Xerox PARC, when Xerox demanded that the PARC's research begat actual tools for the company's printing business [16]. This last episode caused a distinctive change in what windows were supposed to be. Suddenly, as work started on desktop publishing systems, such as WYSIWYG word processors, the window began to represent not just a thought process, or even a computer process, but an actual, soon-to-be-printed-on-paper document. The window became a thing, only virtual. It retained its name while the operative metaphor for its behavior changed to include paper, and not only window. This change became known as the desktop metaphor.

THE DESKTOP AND THE CONTROL PANEL

On a desk, papers, books and tools can be rearranged at will. It is quite so on a computer desktop: we manage our activities through the physical organization of our tools and documents. It has been pointed out that "windows were originally designed as explicit supports for the conduct of multiple activities", most notably because they "can serve as reminders of the existence of the activities contained within them" [15]. The desktop metaphor is well liked by users because of its flexibility, its versatility and its conceptual familiarity, yet despite its success it has been criticized: it is distracting [12], it entails a lot of switching while hunting for the right window, it puts the burden of organizing the computer screen on the user.

Another windowing scheme has been tried in the past [18, 17]: tiling windows around columns. Tiling window managers act not as a desktop, but as a control panel. Everything the user needs for his current activity is visible, generally arranged along two vertical columns of distinct widths. Windows are disposed semi-automatically; the user indicates the column, and the system makes vertical room for the new window. The tradeoff is between control and productivity: an early study [2] has argued that users of tiling systems are more productive, and spend less time "managing" windows than users of overlapping systems. Tiling vs. Overlapping has been an early controversy in the development of windowing systems. It has been settled, for now, through the delegation of window management to the user; since then, many different techniques [7] have been invented to circumvent overlapping systems' alleged flaws.

CONCLUSION: AS MUCH CONTROL AND AS LITTLE MANAGEMENT AS POSSIBLE

A new category of computing devices, exemplified by "home computers" and tablet devices such as the litl webbook or the Apple iPad, and operating systems such as Google Chrome OS, has recently appeared. One of their most distinctive traits, UI-wise, is that they do not make use of windows. Every program uses the full screen. As the makers of those systems put it, the user should interact only with his goals, and not with the technological intermediaries: "By eliminating window clutter and computer administrative debris, you will be able to focus on your stuff;" "No pixel-level window positioning" [12, 4].

As researchers and practitioners keep trying to build mature, usable software interfaces, this remains an open but pregnant question: what does "having too much control" mean? When is it a good thing to have control over the technical, when is it a good thing to hand it off to the computer? Obviously these are important design questions, even edging on the political. A dispassionate and precise look at the history and sociology of interfaces might help frame the issue, and open on a solution.

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