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WINDOWS

Exploring the History of a Metaphor

The 'window' metaphor has a long career in the history of art and, in fact, in the evolution of the human perspective in general. It has been associated with the voyeuristic and inquisitive instincts of man as well as - considering Alberti's use of the metaphor - with the emergence of the 'linear perspective' of modernity. To-day, within our new communications culture, we find multi-dimensional window arrangements - interfaces - that will permit man to navigate the non-Euclidean realms of postmodern cyberspace.

Above all, though, windows have permitted man to experience the essence of light, from Chartres Cathedral to the paintings of Vermeer, and to this day even their most mundane use implies some sort of interaction with the unknown and with infinity.

In addition, the window metaphor has popped up in man's quest for space, referring to time frames for rocket launches; and in that fine political figure of speech: 'windows of opportunity'. So it was no surprise that the word was also chosen to denote a software that became part of the most successful business venture of all times.

I think that exploring the cultural background and context of the window metaphor could greatly contribute to 'civilizing' the new informational technology, integrating it into the mainstream of global cultural heritage (for, obviously, the window metaphor has its place in non-European cultures, too). 'Windows to the universe' are opening up as science advances; 'interface design' could prove to be *the* art form of the 21st century (Steven Johnson). The window metaphor, through history, has, in a sense, prepared for all of this.

The Evolution of the Window

Metaphors, figures of speech and thought, grow out of the experience with natural objects and cultural artifacts. They try to explain or accommodate the unknown through the known. As of recent, for example, human intelligence has been likened to the functions of a computer. This 'computer metaphor' only became possible because of technological advances. Likewise, 'windows' had to be *there* before they could be used as metaphors and in allegories.



'Doors and windows' are the staple of the architectural process. The contrast between prehistoric caves and dwellings having 'openings' (other than an access hole) could not be greater. Even the archaic practice of (skull-)trepanation could be an early cultural expression of the desire to open oneself to multifaceted environs through 'windows'.

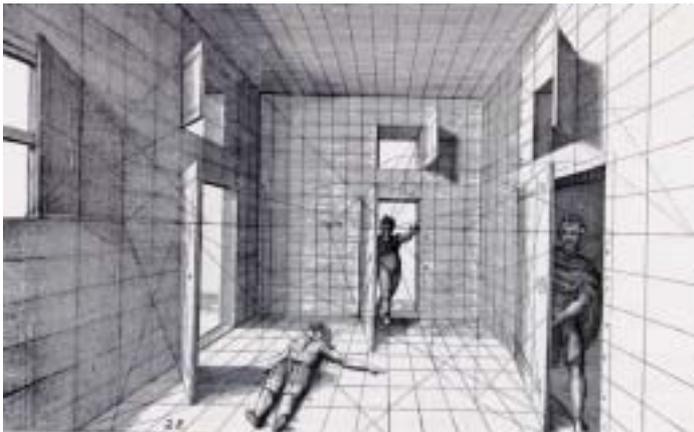
Historically, in Europe, something happened between the emergence of the Gothic style and the Renaissance revolution that bore heavily on the technology (and, for that matter, on the spirituality) of the window and its cultural implications. We will have two or more sections to deal with this.

In Florence, to give an example of the technological advances, the window, at the times of Alberti and Brunelleschi, was still mainly defined by its *shutters*. The windows had nothing but these shutters to close them. Beginning with the fifteenth century, 'impannate' - frames stretched with linnen that had been painted with oil varnish to make it waterproof - were used. The window truly was a *screen*. Tenants took this 'window-furniture' along when they moved. Flat glass panes were practically unavailable commercially and the tondos imported from Venice, France or Flanders were expensive and rarely to be found.

And then the history of window glass: The Romans made flat glass by rolling out hot glass on a smooth table. This produced a window glass that was uneven and not very transparent. Plate glass was first produced at St. Gobain, France, in 1668, by the 'broad glass' method. But even then window glass was a luxury. Only the rich could afford to glaze their windows. In 1871, William Pilkington invented a machine which allowed ever larger pieces of glass to be made. This followed the great Victorian extravaganza in glass, the Crystal Palace of the World Exhibition 1851.

Of course, 20th century architecture, making use of the advances in glass production and window construction, has seen, in a sense, the substitution of the wall by the window, by expanses of complex 'plate glass arrangements'. At the same time the 'reflexivity' of incorporating windows into the architectural experience has increased - along with a knowledge about the shifting relations between the 'interior' and the 'exterior'. By now, what might be called the Interface Culture of the 21st century (Steven Johnson) is emerging. And from all we hear, Bill Gates' new mansion is not noted for its windows, but for the screens and interfaces permeating the building.

The Evolution of the Window Metaphor



The technological advances toward the 'windows' of to-day have been quite slow and only accelerated with the industrial revolution itself. Glass, plate glass, colored glass for centuries had been associated with the high and mighty. Using sheltering windows to look out into wide landscapes or over huddled houses down below was for the very few. The metaphor of opening gates (or crushing them) was much more rampant. The delicately colored light passing through the windows of Gothic

Cathedrals was perceived as a revelation from above, never intended to permit the interactive glimpse from the within to the without.

During the flowering of the Renaissance the term 'window metaphor' became associated with Leon Battista Alberti, who, based on the theory of perspective originated by the paintings and drawings of Filippo Brunelleschi, in 1435 published his famed 'De Pictura'. This was the first theoretical and critical account 'on how to paint' in an aesthetically attractive and visually convincing way. He expounded on the central or 'linear' perspective as a way to constitute a form of

interactivity between artist and viewer : “the existence of another virtual space, another three dimensional world enclosed by a frame and situated inside our normal space.” (Lev Manovich) But this had consequences. The ‘modern’ perspective entailed the imprisonment of the body on both the conceptual and the spiritual level – both kinds of imprisonment already appearing with the first screen apparatus, Alberti’s perspectival window ...

A painting following this theory was particularly convincing if the central perspective was offered through skillful window arrangements. Alberti continued to apply his ideas (especially about windows) to architecture and, in his capacity as an architect, has to be ranked alongside the likes of Michelangelo and Leonardo.

Jan Vermeer would, in a way, rediscover the mystic of light for modernity. But what should be important for the archaeology of the window metaphor is, first of all, the immense value of the *screen* (which really was what the early windows were) for representation. Looking back, the window as a screen describes equally well a Renaissance painting and (recall Alberti) a modern computer display. Manovich: “Even proportions have not changed in five centuries ... (... the very names of the two main formats of computer displays point to two genres of painting: a horizontal format is referred to as a ‘landscape mode’ while the vertical format is referred to as ‘portrait mode’.)”

The window metaphor bloomed during the evolution of the modern theatre and its stage (‘Guckkastenbühne’) and finally during the 19th century, when introspection and voyeurism led to a host of rather strange viewing apparatuses. And then, a hundred years ago, a new screen became popular, the ‘dynamic screen’, the screen of cinema, television, video. “The dynamic screen brings with it a certain relationship between the image and the spectator - a novel viewing regime ...” (Lev Manovich)

„Thanks to Microsoft’s lavish advertising budgets, the window is now shorthand for a wide array of innovations that make up the modern interface. Forget about the mouse pointer, and the desktop metaphor, and the menu bar - the history of interface now neatly divides into two epochs: pre-windows and post-Windows.“ But, Steven Johnson continues, we even begin to no longer think of our virtual windows as *analog*s of the real-world version. “They’re species unto themselves.”



Source of Eternal Light: the Gothic Cathedral

„The gothic stained-glass window, for ever unexplained, for ever inexplicable, lasted throughout the age of ‘true gothic’. Master and servant of light, whose effect comes less from the colour of its mosaics or fragments of glass than from a certain unanalysable quality of both colour and glass. For as a fact this glass does not react to light like ordinary glass. It seems to be transformed into precious stone that does not so much let the light pass as itself become luminous. Under harsh and direct action of the sun, a stained glass window does not project its colour as does merely tinted glass, but only a diffused, clear splendour. Another peculiarity is that whether light outside the church is soft or harsh the window is just as splendid and even remains luminous in the shades of twilight as in full day. No chemical analysis has so far, to our knowledge, penetrated the mystery of the gothic window.“

These musings by Louis Charpentier, author of a controversial book on ‘The Mysteries of Chartres Cathedral’, nevertheless reflect the very special effect of these ‘light sources’. The magic of the gothic window well merits exploration.

Renaissance: the Appearance of the Screen



“Writing about Dürer’s famous print of a draftsman drawing a nude through a screen of perspectival threads, Martin Jay notes that a ‘reifying male look’ turns ‘its targets onto stone’; consequently, the marmoreal nude is drained of its capacity to arouse desire. Similarly, John Berger compares Alberti’s win-

dow to ‘a safe let into a wall, a safe into which the visible has been deposited.’ And in the *Draughtsman’s Contract*, time and again the draughtsman tries to eliminate all motion, any sign of life from the scenes he is rendering. With the perspectival machines, the imprisonment of the subject also happens in a literal sense ... [up to the] petrified world of the photographic image ...” (Lev Manovich)

What Renaissance artists had clearly achieved through careful observation of nature, including studies of anatomical dissections, was a means to recreate the 3-dimensional physical reality of the human form on 2-dimensional surfaces. In part, the key to this achievement lay in understanding the underlying, hidden structure of the human body. But in addition, by literally systematizing the ‘view through a window’, a similar inspiration occurred to those seeking a corresponding dramatic reality in the representation of physical space. A means - namely window-like frames - was devised early in the 15th century for translating the reality of 3-dimensional natural phenomena onto 2-dimensional surfaces, producing virtually realistic copies. A correspondence was thus made possible, through mathematics, between the representational reality of the artist and the physical reality of nature.

Light on Privacy: the Windows of Jan Vermeer

Perhaps the most famous metaphorist of the window has to be Jan Vermeer. With him the light mysticism of the Gothic cathedrals and the aesthetic achievements of the Renaissance were transformed and focused on the individual, on the privacy and intimacy of personal relationships. His paintings, his painted window metaphors, have had tremendous impact on establishing the private sphere that came to be the underpinning of civil society. And in some sense these paintings are shedding an eerie light on the ongoing privacy debate relating to electronic communication. We will discuss this painter extensively, trying to find out what motivated him and how his art has been discussed and received up to now.



Window Dressing: Staging the Theatrical Stage

At first, in ancient Greece, the stage was known as the orchestra, and was used as a dancing place for festivals honoring the god Dionysos. As the drama developed the need arose for scenic backgrounds. By the time of the thirteenth century, the stage had been moved to the level of the spectators' eyes, with an elaborate scene built and painted in perspective, creating the illusion of depth without enlarging the stage itself. The 'window metaphor' was beginning to conquer stage design and theater experience. The Vincenzian architect Andrea



Palladio, in constructing his Teatro Olimpico, elaborated on the window theme, creating, for instance, various stage openings with complex scenes of streets. His central arch was a step toward the picture frame stage setting we know today, in which the action takes place inside a box shaped stage ('Guckkastenbühne') behind a large rectangular arch. This arrangement was quickly favored over previous conventions because it separated the actors from the audience in such a way as to create a 'moving picture'. This type of stage made for real drama exactly because, within the real space occupied by the audience, it opened a window into a virtual world.

Through the Looking Glass: Virtual Reality in Victorian England

A "screen's frame separates two spaces, the physical and the virtual, which have different scales. Although this condition does not necessarily lead to the immobilization of the spectator, it does discourage any movement on her or his part: Why move when s/he can't enter the represented virtual space anyway? This was well dramatized in *Alice in Wonderland* when Alice struggles to become just the right size in order to enter the other world." (Lev Manovich)



"As you read *Alice in Wonderland* and *Through the Looking Glass*, consider the complex relations of these pre-electronic multimedia works and the questions they raise. For example, since the author of the verbal text (Dodgson/Carroll) so influenced the images that accompany it, can one interpret that verbal text without paying attention to the visual?" (George P. Landow) Steven Johnson insists, that "the most compelling cultural analogy for the hypertext webs of today's interfaces turns out to be not the splintered universe of channel surfing, but rather the damp, fog-shrouded streets of Victorian London, and the mysterious resemblances of Charles Dickens."

Space and Time: the Epistemology of Screening and Framing

One of the most reputed philosophical websites on the Internet is called 'The Window'. 'Cognitive Mapping' in space and time, from the cave drawing to the computer image, has always relied on selection, on borders, on 'screening' and 'framing'. "The Scientific Revolution fed in part on a transformation in the comprehension of space that had originated in the fifteenth century with

the invention of the linear perspective, the theory and methods of representing three dimensions on a two-dimensional surface. The painter enthusiasts of perspective, some of them accomplished theorists themselves, were often conversant with works of mathematics, geometry, and proportion, and were acquainted with the engineers, architects, artisans, and instrument makers who put these findings to practical use.” (Daniel J. Kevles) Now other screens than those of the 16th century Nuremberg school of perspective are gradually coming to dominate visual culture – video monitor, computer screen, instrument display. And instead of freezing space in time, the scenes in the these windows can change in *real time*. This “latest mutation in space - postmodern hyperspace - has finally succeeded in transcending the capacities of the individual human body to locate itself, to organize its immediate surroundings perceptually, and cognitively to map its position in a mappable external world. It may now be suggested that this alarming disjunction between the body and its built environment - which is to the initial bewilderment of the older modernism as the velocities of spacecraft to those of the automobile - can itself stand as the symbol and analogon of that even sharper dilemma which is the incapacity of our minds, at least at present, to map the great global multinational and space centered communicational network in which we find ourselves caught as individual subjects.” (Fredric Jameson)

The Eye: Mirror and Window of the Soul



There should be a place, within our project, to explore the metaphorical realm linking the ‘eye’ to the ‘window’. The ancient notion of the ‘Third Eye’ points to the idea that there might be windows behind the window etc. Early medieval thinking revolved around the notion that true insight was possible only in a succession of steps, opening window after window in unfolding the meaning of phenomena. The observations and experiments of René Descartes on how refraction of light rays by the eye’s lens produces an inverted image on the retina provided a physical basis for the understanding of visual perception. Scientific knowledge together with the sophistication of religious and mystical thinking around this very special window, the eye, constitute, as Steven Johnson points out, an important source for interface culture and design.

The Window Metaphor in Islamic Culture

The use of geometry in Islamic architecture and ornament – especially in latticework and other ‘infinite’ patterns – has been interpreted as visual demonstrations of the singleness of God and his presence everywhere. These patterns represent ‘unity in multiplicity’ and ‘multiplicity in unity’. “The continuity of the interlacement invites the eye to follow it, and vision is then transformed into rhythmic experience accompanied by intellectual satisfaction given by the intellectual regularity of the whole.” (Jacob Burckhardt)

Long before tinted glass was able to filter and enhance light, the geometrical latticework of Islamic architecture had created a very special kind of screen – flat and multidimensional at the same time – that could fill window openings with cultural, religious and even intellectual meaning. “Nervously pulsating around multiple foci of rotational symmetry, labyrinthine girih pat-



terns acted as seductive magnets that afforded no rest to the attentive gaze. Seeing became, in effect, reinventing new patterns each time the gaze attempted in vain to fix itself on these interpenetrating geometric shapes or to dissect their concealed underlying schemes.” (Necipoglu) This not only made for the screens of the Serail, which caught the imagination of the 19th century – it also is proving to be a design principle for the modern interface.

The Window Metaphor in Buddhism and Confucianism

Buddhist architecture can be traced back to B.C.255 when the Mauryan emperor Asoka established Buddhism as the state religion of his large empire. Buddhism spread rapidly throughout India and other parts of Asia. Buddhism was, as it were, a graphic creed, and correspondingly its expansion was accompanied by a distinctive style of architecture that expressed the teachings of Buddha. While Asoka was elaborating *stupas* by adding gateways etc., in western India complex temples were carved out of living rock, creating, one might say, ‘Platonic caves’ – for metaphorical management of (spiritual) light obviously plays a pivotal role in Buddhism. Further architectural advance provided splendid examples of ‘window art’ – which left its traces in painting, oral and written literature and certainly in modern interface design within India’s prolific programming industry. - The screen, the screen window and its metaphorical context have also been developed within Confucian culture and – a very important aspect – in Japan. In fact, we expect some real striking findings here.



Walls of Glass: the Essence of Architecture

Shaping light through an ‘Architecture of Glass’ (Francisco Asensio Cerver) has become almost a mainstream venture where representative, large scale buildings are to go up. Skyscrapers all over the world follow the trend. Playing with, reflecting on and exploiting the possibilities of modern glass technology has led to engineering marvels, public sculptures on a monumental scale. Many of these urban towers are clad in reflective glass, joining the properties of the window and the mirror. Color, light and glass are integral to the architecture of our time. The Victorian *Crystal Palace* might have set the stage, but true reflection on the meaning of the glass window began with Bruno Taut’s 1914 glass house, with the works of Frank Lloyd Wright and Le Corbusier. Since then, in addition, the development of the ‘real-time screen’ of monitors and of interactive computer screens left its impact on the ‘postmodern’ stages of the architecture of light: integrating glass and various interfaces – as in Bill Gates’ Seattle mansion.

Modern Painting: in Defense of the Classical Screen

“Visual culture of the modern period, from painting to cinema, is characterized by an intriguing phenomenon: the existence of another virtual space, another three-dimensional world enclosed by a frame and situated inside our normal space. The frame separates two absolutely different spaces that somehow coexist. This phenomenon is what defines the screen in the most general sense, or, as I will call it, the ‘classical screen’.” (Lev Manovich)

It seems almost a miracle that modern painting – or at least the art of High Modernism – has clung to that frame or screen, reflecting on its ‘windowness’, not shedding its confines, but rather



'defending' the classical screen the Renaissance had established as the space within which our images of the world were to develop. "It is a flat, rectangular surface. It is intended for frontal viewing (as opposed to, for instance, a panorama). It exists in our normal space, the space of our body, and acts as a window into another space." (Lev Manovich)

To look at modern painting (not at postmodern art) will show that, "like centuries ago, we are still looking at a flat rectangular surface, existing in the space of our body and acting as a window into another space." (Lev Manovich) It would be interesting to discuss – and maybe put into question - this perseverance of painters like Picasso, Matisse, Munch, Chagall, Dali etc.

'Peep Show' and 'Fensterln': Folklore of the Windows Experience

The subject of 'peep shows' obviously opens up a Pandora's box we would merely touch, although this subject, too, brims with history and cultural traditions all over the world.

The ancient Bavarian practice of 'Fensterln' not only echoes the tradition of the serenade below balconies and open windows, it is, itself, echoed by computer lingo referring to various interface programming tricks.



A very interesting, vast collection of 'media magica' (optical viewing toys, magic lanterns, cameras, phantasmagoria, zoopraxiscopes, dioramas etc.) has been assembled by Werner Nekes. As early as in the fifteenth century exploring the world of perspectives led to the wish to see and devise moving images. All these devices, obviously, had to construct windows

(frames, screens) to present paper animations and the like. The nineteenth century saw an explosive growth and huge commercial success of the media magica, just before the first cinematic images were shown. In these sometimes primitive, sometimes elaborate contraptions the possibilities of the window were explored in all directions, in many ways preparing the aesthetics of early cinema.

Window Shopping: the Commodification of Desire

Window shopping as a fact rebuilding elegant valances to show off to their friends, whole indulgent Belgian movie 'Window Shopping' by Chantal Akerman. And since everything is being commodified, there is no window to stries cater to the need to attract customers with attractive shop-window displays. Virtual window shopping is the and as a metaphor conjures up many aspects of daily life. There was that day that is not subjected to a little 'dressing' for the markets. Home owners aname of the game in the commercial sections of the Internet. And many programmers and software companies offer options for 'window dressing' Windows 95, 98, 2000. The design of attractive shop windows has, by now, an intriguing history, going back at least to the eighteenth century and including, not to forget, those certain windows in the red light districts of Amsterdam or Hamburg.

The Window Metaphor in Modern Science

"A computer monitor connected to a network becomes a window through which we can be present in a place thousands miles away ... VR, interactivity and telepresence ... are made real by a

much, much older technology – the screen. It is by looking at a screen – a flat, rectangular surface positioned at some distance from the eyes – that the user experiences the illusion of navigating through visual spaces ... If computers have become a common presence in our culture only in the last decade, the screen, on the other hand, has been used to present visual information for centuries - from Renaissance painting to twentieth century art.” (Lev Manovich) The omnipresence of windows, screens and frames has seeped into every aspect of scientific research and theoretical thinking. And now the computer world is pouring its metaphorical potential into the scientific process wherever you chance to look.

Journeys through Space: the Cinema Screen



The origins of the cinema's screen are well known. We can trace its emergence to the popular spectacles and entertainment of the eighteenth and nineteenth centuries: magic lantern shows, phantasmagoria, eidophysikon, panorama, diorama, zoopraxiscope shows, and so on. The public was ready for the cinema and when it finally appeared it was a huge public event.

The window as a metaphor, of course, cannot be separated from the general aesthetics of film making at all. Jean Luc Godard, perhaps more than any other film maker, has reflected upon this fact in his later films, which, for most filmgoers, became increasingly difficult to comprehend. Nevertheless he already during the '60s - through jump cuts, cinema as collage, self-referential cinema etc. - reacted to the loss of the central perspective within the confines of the cinematic window or looking glass itself.

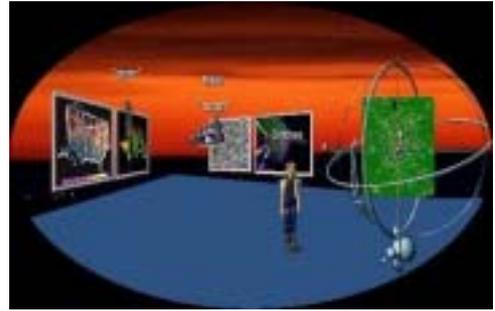
'Words Upon The Window Pane', a film by Mary McGuckian, starring Geraldine Chaplin, uses reflections upon an episode in Jonathan Swift's life to explore the spiritual connotations of the window metaphor. And there are many films dealing directly with the metaphor. Think of 'Rear Window', the most densely allegorical of Alfred Hitchcock's masterpieces, moving from psychology to morality to formal concerns and finally to the theological.

Surveillance: Monitoring the Radar Screen

Space rocket launches had to cope with the problem of 'time windows'. In the wake of US space programs political talk about 'windows of opportunity' proliferated. But more important: "as with all other elements of modern human-computer interface, the computer screen was developed by the military ... With radar we see for the first time the mass employment ... of a fundamentally new type of screen, the screen which gradually comes to dominate modern visual culture – video monitor, computer screen, instrument display. What is new about such a screen is that its image can change in real time ..." (Lev Manovich) A fact sheet coming out of 'U.S. Strategic Command Public Affairs' tells about one of its most important former missions: "An essential element of America's ability to command, control, and communicate with its nuclear forces is the Airborne Command Post, also called 'Looking Glass'. Its highly-trained crew and staff ensure there is always an aircraft ready to direct bombers and missiles from the air should ground-based command centers become inoperable. Looking Glass guarantees that U. S. strategic forces will act only in the precise manner dictated by the President."

Archaeology of the Computer Screen

Manovich discusses a possible genealogy of the modern computer screen. In this genealogy, the computer screen represents an interactive sub-type of the real-time screen (the radar screens, the displays and TV monitors), which again is a sub-type of the dynamic screen of cinema - which again is a sub-type of the classical type established 5 centuries ago. This typology relies on three ideas. The idea of temporality permits to see the window, the screen as a frame 'freezing' a situation 'in time' - actually from Dürer's perspectival machine to the frames of photography and cinema - and finally in a breakthrough to the real time scanning of TV monitors and the real-time interactivity of the computer screen. Secondly, any screen is a window into the space of representation which itself exists in our normal space. Thirdly: "The scene, the picture, the shot, the cut-out rectangle, here we have the very condition that allows us to conceive theater, painting, cinema, literature, all those arts, that is, other than music and which could be called the dioptric arts." (Roland Barthes) Virtual Reality, on the other hand, continues the tradition of simulation, which, for example, was first established by the panorama. However, writes Manovich, "it introduces one important difference. Previously, simulation depicted a fake space which was continuous with and extended from normal space ... In VR, the actual physical reality is disregarded, dismissed, abandoned." This might be the end of windows.



How 'Windows' Chanced To Become A Registered Trade Mark

Reflections from Microsoft's PR people: "An Awesome Launch for an Awesome Product: Windows 95 would launch in August 95. The PR program began 20 months before. How do you sustain a nearly two-year program without any advertising until the end? How do you follow the most successful product launches in Microsoft history and convey that Windows 95 goes beyond a 'mere' launch to be a milestone in the history of the PC? How do you do all this against the backdrop of the Internet, a rapidly evolving technology and market force that forced continual refinements to the features and positioning of Windows 95?" (Waggener Edstrom)



"But why should a window-driven interface be easier to use than a text-driven one? ... The relationship seems simple enough: spatial information is easier to navigate than textual information, and windows are just a tool for seeing that space, like a looking glass or a microscope ... Windows are more fluid, more portable. You can drag them across your screen, resize them with a single mouse click. They're designed to be malleable, open-ended. Most computer users are constantly tinkering with their windows, making them bigger or smaller, pushing them off to the peripheries of the desktop or bringing them into focus." (Steven Johnson)

Text-driven interfaces within windows? Windows that are no longer analogs to the real world version? Windows that go unregistered as trademarks? Everything is possible.

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