

Preface

I've always been curious and interested of graphical user interfaces. At the age of 10, I remember using PowerPoint to design user interfaces for my old bulky computer and later on my first smartphone (Samsung Galaxy Young).

At the age of 11, I began developing utilitarian software like web browsers, media players and file downloaders using C# on Windows, by following YouTube tutorials. I started thinking about the design part of these apps, how can I make them pretty and usable? how can I make them interesting? how can I make them intuitive for their users? how can I make them stand out and be different from what the tech giants are making.

I also find it fascinating designing interfaces of operating systems, and the point of contact and connection between humans and machines. The portal to other apps, services, tools, while discreet has to be well designed.

Introduction

A Dictionary

GUI: Graphical User Interface

UI: User Interface

UX: User Experience

CPU: Compute Processing Unit

GPU: Graphical Processing Unit

OEM: Original Equipment Manufacturer

OS: Operating System

What is Skeuomorphism?

Way before screens, Skeuomorphism traces its roots from material objects and artistic movements like Art Nouveau, but it was only quoted on computers starting from the 1980s. Skeuomorphism is considered to be the use of metaphors of real life to mimic the real-world objects represented. In GUIs, skeuomorphism manifests itself where elements like buttons, icons, layouts and backgrounds mimic real-world counterparts by using textures, shadows, 3D effects and sounds to enhance realism. One of the most common example that is always given is "the iPhone's old visual interface".

Familiarity plays a big role with Skeuomorphism, as the GUIs leverage people's existing knowledge of physical objects, reducing the learning curve associated with new interfaces and allowing novice users to use without extensive instructions. There's also details we don't really talk about when discussing Skeuomorphism in UI design, and that is feedback either haptic or audible with animations or sound effects to help with user immersion.

Research Question

It's with that fascination in user interfaces that I wanted to revisit Skeuomorphism, maybe out of Nostalgia, but more importantly investigate the emotions of people who used these interfaces and what they think of

them now. I'm also thinking about the future, as we're recently seeing a return to three dimension styling to user interfaces. So, how does the evolution of skeuomorphism influence our perception of graphical interfaces, and what role does accessibility and nostalgia play in the way we consider and design new interfaces?

Context

A small bit of History

In a small research lab down in Palo Alto, was an all-in-one desktop computer prototype that amazed anyone who had the chance to see it. The few who had the chance to meet this machine, took the main idea and ran with it to create a new generation of personal computers.

That computer was the Xerox Alto, imagined at Xerox's PARC, and considered by many the first computer to feature a GUI, a Graphical User Interface, that almost turned the world upside down.

Using common language, the portrait monitor displays text, small icons and allowed the use of multiple programs at the same time, in what was called the Desktop, just like the one at work, with items on it. The Alto is the first computer to use a WYSIWYG, What You See Is What You Get, text editor and bitmap display, meaning that you could print exactly what was displayed on the screen. Steve Jobs and Bill Gates both went to see this marvel and went on to copy the idea for their respective software, with Apple unveiling the Lisa in 1983 and the Macintosh in 1984. As for Microsoft, the first version of the Windows OS, operating system, was announced in 1983 as a GUI add-on for MS-DOS, but later came out as a standalone OS in 1985 and was licensed by PC manufacturers, mainly IBM.

In 1988, Apple filed a lawsuit against Microsoft and Hewlett-Packard for using visual GUI elements similar to Apple's Lisa and Macintosh OSs. Seeing this lawsuit, Xerox also filed one against Apple alleging that the Macintosh's GUI was heavily based on the Xerox Alto's OS.

After 4 years and an unsuccessful appeal to the Supreme Court, the United States Court of Appeals for the Ninth Circuit dismissed. Claiming that "Apple cannot get patent-like protection for the idea of a graphical user interface, or the idea of a desktop metaphor which concededly came from Xerox. It can, and did, put those ideas together creatively with animation, overlapping windows, and well-designed icons; but it licensed the visual displays which resulted."

From that point on, GUIs kind of became open-source, in a way that nobody could copyright the famous desktop metaphor. This led to the popularisation of personal computers and the internet coming at the same time.

At the 2000 Macworld Conference and Expo in San Francisco, Steve Jobs announced a complete reengineering and redesign of MacOS calling it MacOS X (or 10). A new base and architecture, that comes with a new design language called Aqua. During the event, Jobs stated that "it's liquid, one of the design goals was when you saw it you wanted to lick it". Breaking up from the gray, pixelated and static design of the 1990s, Aqua was about droplet-like components, reflections, translucency, depth and life-like material textures.

This move started a new trend, for a new decade. Aqua was possible thanks to advancements in technologies like improved processor speeds and more importantly GPUs that allowed the display of life-like shadows, three dimension effects, animations and better anti-aliasing fonts. The 2000s saw the Apple UI design and MacOS X's versions evolve into more refined and less flashy visuals till the 2010s, with Microsoft also jumping into the same train in 2001 with Windows XP, followed by Windows Vista (and its development hell with

Codename Longhorn) and finally Windows 7. At the same time, linux-based OSs were growing and more and more started incorporating Skeuomorphic elements like Ubuntu.

But before the 2010s ended, Apple unveiled its most successful device after the Macintosh, based on MacOS X's design language; the iPhone. Although not being the first smartphone, it brought a lot of the desktop's Skeuomorphism language to the pocket, with a finger-friendly touch interface but also a rethinking of mobile phone interactions. In 2007, the landscape of mobile phones was pretty crowded. Many OEMs were fighting in a booming market with clunky, slow, unresponsive and not touch friendly phones, until Apple came and proposed a vision of what smartphones should be. This vision was later taken by multiple OEMs and made it their own for the years to come, leading to a wide spectrum of skeuomorphic mobile GUIs, from Google, Samsung, HTC, Motorola and others all creating different looks on top of the Android OS.

In 2006, Microsoft released the Zune, an mp3 player created to take on the Apple iPod. The Zune was different, and made use of lowercase typography, a grid and monochromatic font colors. But Microsoft only went full Flat Design on its modern new mobile OS, Windows Phone 7, bringing a fresh take on mobile GUIs and differentiating themselves from the competition, fully breaking up from the Skeuomorphic 3D visual style they've called Windows Aero. Windows Phone 7 was considered a breathe of fresh air by people as the Skeuomorphism Spectrum was beginning to become crowded. That style was called Metro (before changing its name because of a lawsuit over the name). Metro is based on the design principles of the Swiss Design style; clear typography, large texts, simplicity and was considered more artistic in a way. The interactivity part was also important as motion played a bigger role, all while being simple.

In 2013, Apple announced its 7th major version of the iPhone OS, iOS 7, that completely strips away the Skeuomorphic Design Language for a more Flat and Flashy Design Philosophy, with other OEMs following on the trend.

Flat Design became the norm, providing clear, simple and efficient design to designers and app developers. It was a breathe of fresh air in general, and everything that came out using a skeuomorphic visual style at the time was considered out of date. Apple followed for MacOS X on 2014 by incorporating flat design elements from iOS 7.

That is until the 2017 when Microsoft revived the movement announcing the Fluent Design System focusing on five key principles; Light, Depth, Motion, Material and Scale. But at the time, it was only an evolution of Microsoft's flat design that was also pushed by the release of their mixed-reality headset, Hololens. Interacting in space has to feel 3D, and flat design was just not made for that.

In 2020, Apple announced a new version for its Mac OS (Big Sur), reconciling with Skeuomorphism or a smart part of it by launching new icons and interfaces. Recently in 2024, iOS also received small hints of Skeuomorphism through some parts of the OS and its apps. Microsoft followed with Windows 11 by bringing a rounder and fresher design.

In 2023, Apple announced a mixed-reality headset called the Vision Pro and claiming "The era of spatial computing is here". Using codes of the desktop metaphor, you could interact with your hands just like any other VR or AR headset.

Methodology

Mixing qualitative and quantitative surveys and interviews, I wanted to know how ordinary people think of Skeuomorphism in user interfaces. I started interviewing people (ordinary people and designers) for an hour,

where we went back in time and used old technologies from more than ten years ago! Apart from that, I went on to post a survey on some Reddit groups to gather insights on people but also references.

The interviews I first conducted consisted of asking people about their knowledge of Skeuomorphism, explaining it, comparing it to Flat Design, asking their opinion on both design styles and finally enquire them about their ideas for future GUIs or UIs in general.

On the table in front of them, multiple diverse electronic devices that best represent the tech era. The devices were composed of two laptops and three smartphones, displaying a range of what I now call *The Spectrum of Skeuomorphic GUIs*.

The next step was to make them choose one device from the table, turn it on and use it until they want to go to another one. While they're using it, I'm asking questions and guiding them to open apps like Calendar, Notes, Media Player, etc. All while prompting them for reactions and emotions.

Cases

In this chapter, I will analyze different operating systems that mark the 2010s era, especially the last remnants of what we call Skeuomorphism and what can be considered peak Skeuomorphism.

For each case, I will describe and analyze Visuals, Acoustics and Motion settings of each, and will also describe how people used these interfaces.

Visual

Glossy Elements, Textiles, Metal, Wood, Paper, ...

Visually, Skeuomorphic GUIs stand out a lot.

Acoustics

Sound Effects.

Motion

Movement and animations

The Spectrum of Skeuomorphic GUIs (is this really necessary?)

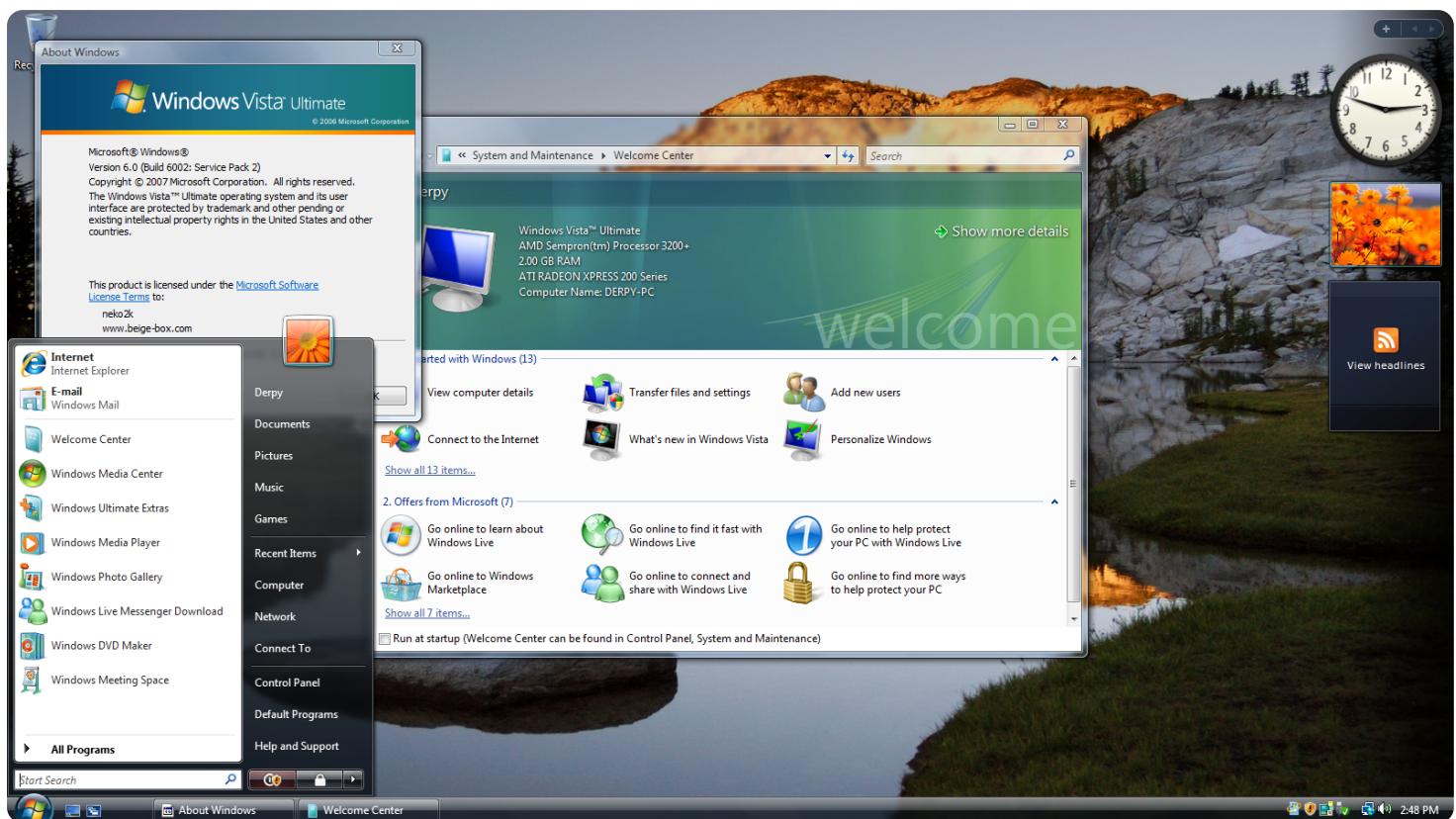
Here's a visualization of all kinds of Skeuomorphic GUIs, as I've discovered there are lots of different designs and views of the Skeuomorphic Design movement.

 [The_Spectrum_of_Skeuomorphic_GUIs_241001](#)

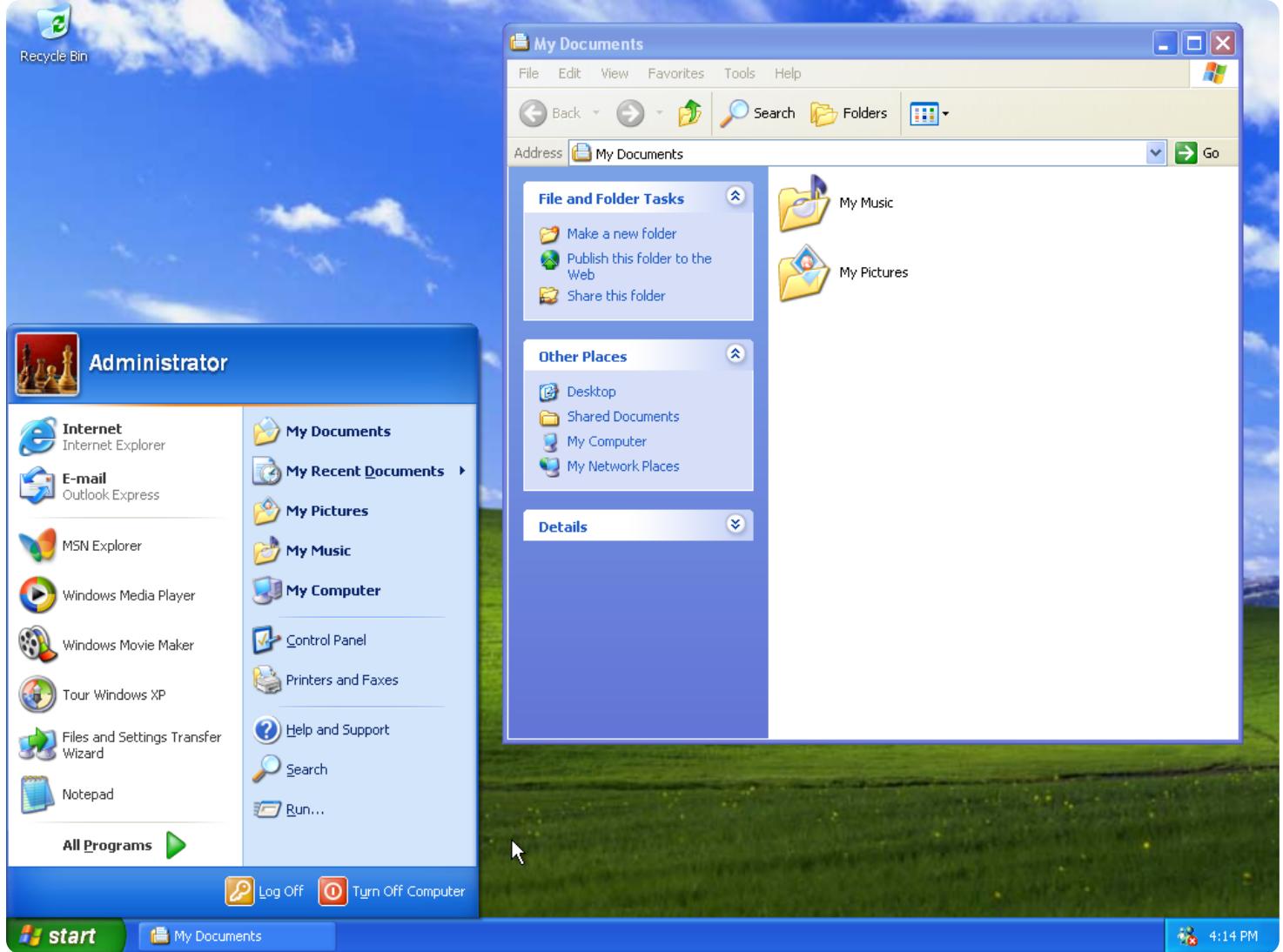
Windows Aero

Developer: Microsoft

Period: 2005-2012



Introduced with Windows Vista in 2005, Aero was a complete redesign of the Windows interface, replacing Windows XP's Luna theme. According to Microsoft, Aero stands for "Authentic, Energetic, Reflective and Open" and goes way beyond what Luna achieved, in terms of visuals, performance and animations.



Visuals

People who used this OS, felt it was so glossy and looked shiny. They felt that the glossy and transparency elements gave the UI a light look to it. The most visible element on a desktop OS is the wallpaper, and the default wallpaper that comes with Vista references the northern lights. This can be considered skeuomorphism, in a way of employees view of auroras from Microsoft's headquarters in Redmond, USA (ref. Jenny Lam). And then comes the Desktop UI elements like the taskbar at the bottom, the icons all over the wallpaper and the widgets on the right.

The taskbar looks shiny with its dark and glossy look. The Windows button all the way to the left has this glow to it that resembles a real button. And when you press it, it glows brighter signaling a feedback to the user, just like a real button.



When opening windows and programs, most of the time the title bar is translucent, giving the impression that windows are slabs of glass. Putting windows on top of other windows shows the translucency and blur that is happening. Just like putting many slabs of glass on top of each other, visually mimicking house windows.

Shadows also play an important role in adding depth to windows and make them appear floating on the desktop. Today, we take that for granted, but shadows were heavy on performance, as with the blur and translucency effect. This is eventually what led to the hate of Windows Vista, as it had problems running on computers of the time.



With this new visual style came a new typography that was designed especially for this new era. Developed by Steve Matteson at Monotype, Segoe replaces Franklin Gothic and Tahoma that Microsoft was using for its branding and UI. This new typeface characterizes itself as a humanist font family (Based on the VoxATypI classification). Segoe also worked great on the brand new LCD displays at the time.

Segoe UI

The quick brown fox jumps over the lazy dog

Aa Bb Cc Dd Ee Ff Gg Hh Ii Jj Kk Ll Mm

Nn Oo Pp Qq Rr Ss Tt Uu Vv Ww Xx Yy Zz

1234567890 .,!#%&*&@;:

Penultimate

The spirit is willing but the flesh is weak

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Acoustics

Outside of the trash bin sound when it's emptied, Aero brings many high quality sounds. From the startup sound to the email notification sound. The audio cues of the new sounds are more softer than Windows XP's literal ones.

These new sounds sound more synthetic, magic and glassy.

ALLCHIN, Jim. *Windows Vista Team Blog: The Sounds of Windows Vista*. (2006, November 9).

<https://web.archive.org/web/20061110152317/http://windowsvistablog.com/blogs/windowsvista/archive/2006/11/09/the-sounds-of-windows-vista.aspx>

Motion

Windows has been very static throughout its early years, and with this new design language came a new way of animating interface elements. Opening programs and closing them was animated with a fade in and fade out for example, things we take for granted today.

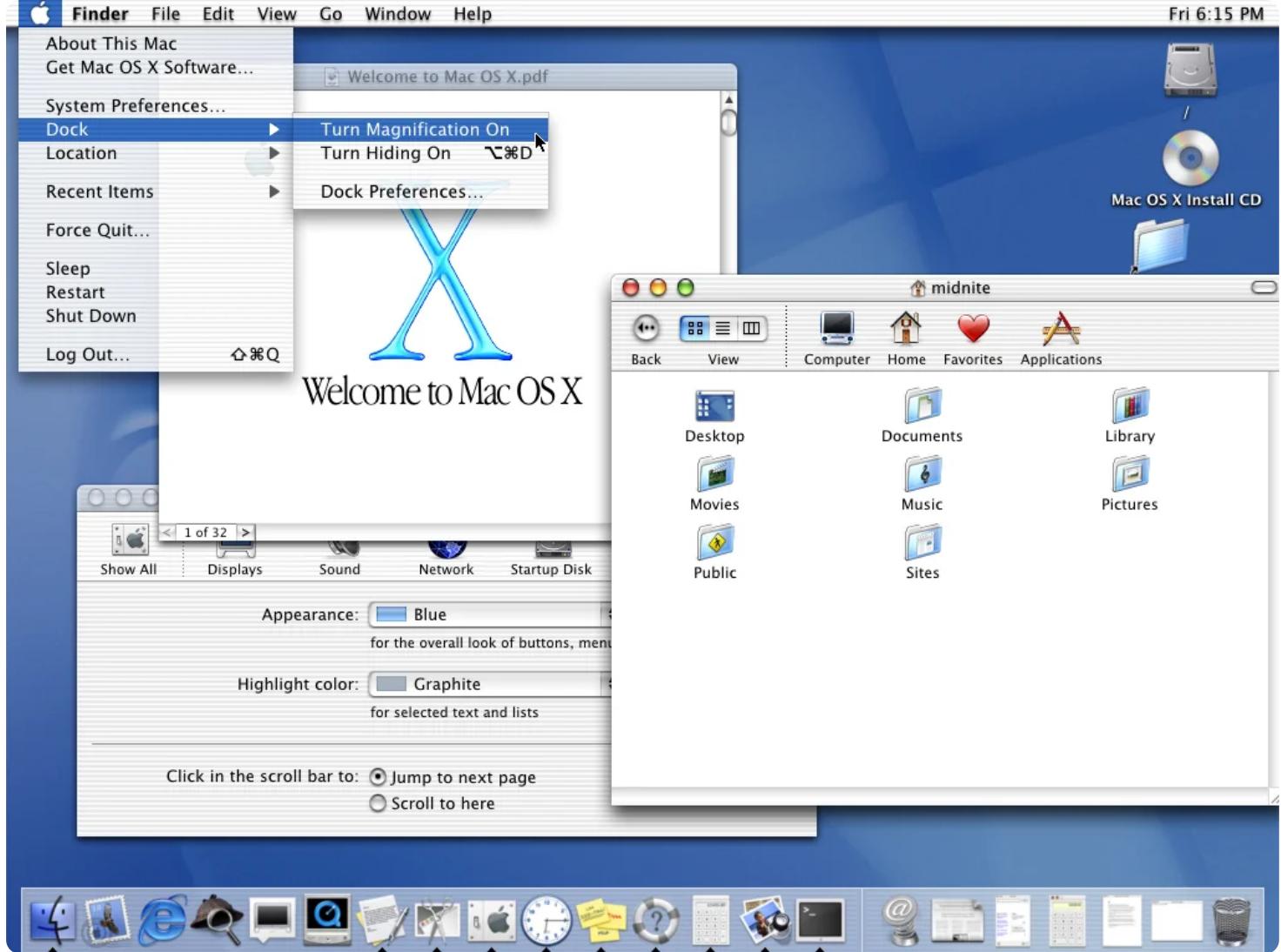
There also was a new feature called 3D Flip that allowed you to see and switch from your open apps in a 3D way, giving an impression of control and power over the computer.



MacOS Aqua

Developer: Apple Computer

Period: 2000-2020



Introduced with the tenth version of Mac OS in 2000, Aqua was also a complete redesign of the Mac OS interface. It was originally based on water and evolved into a more discreet visual style. The first version of Mac OS X was all blue.

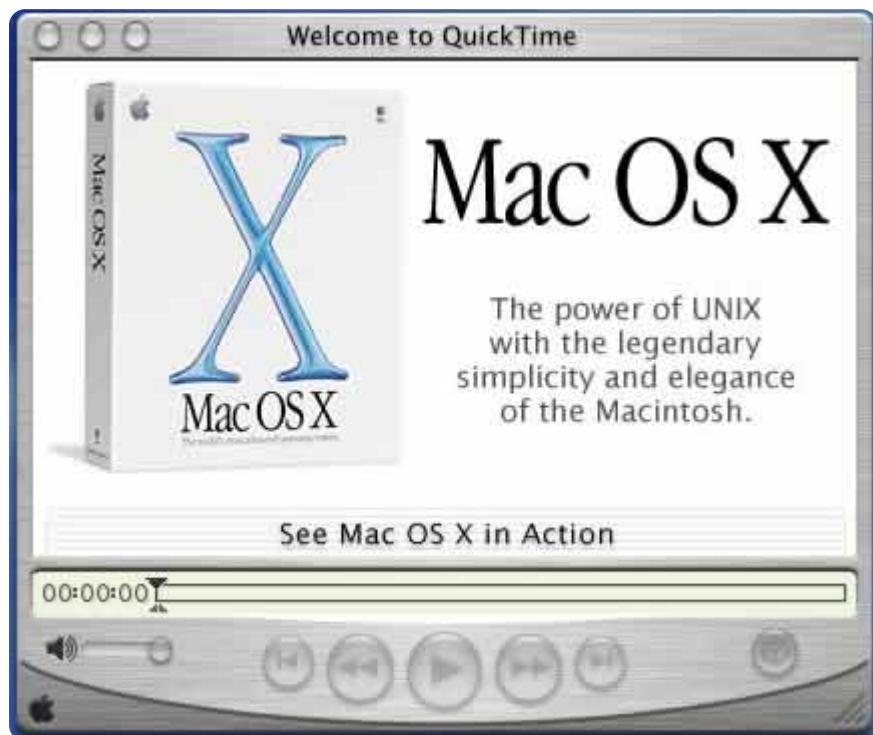


Visuals

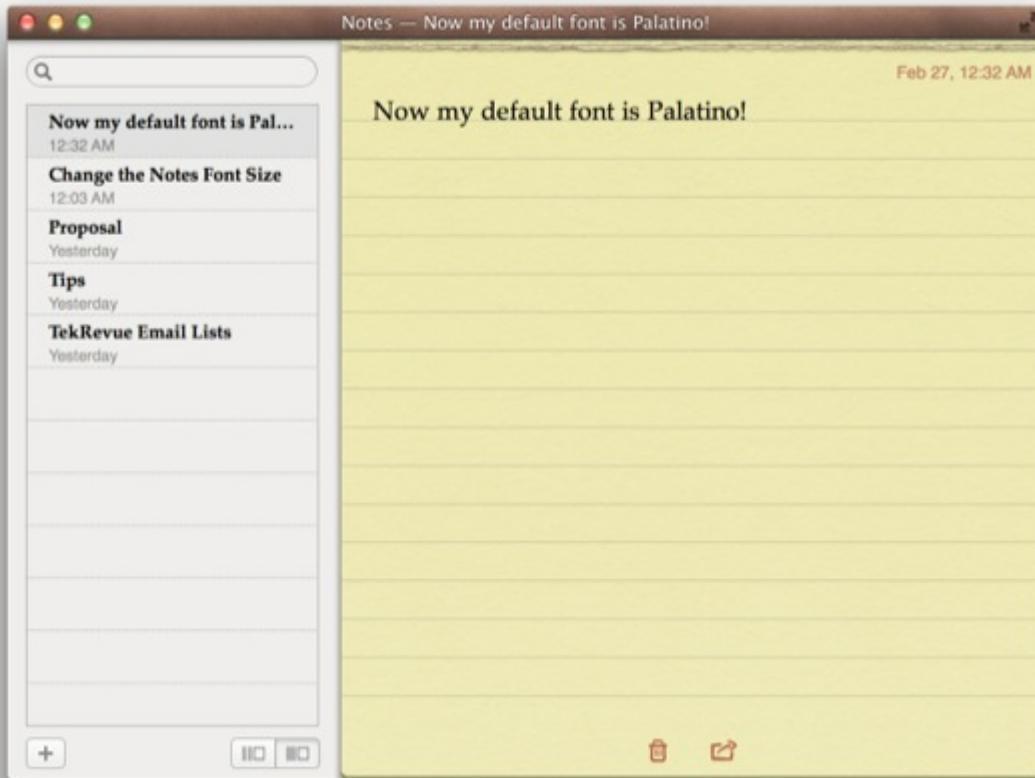
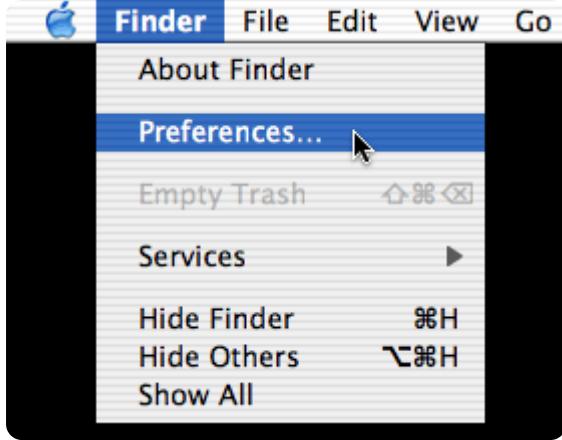
During the announcement of this new version of Mac OS, Steve Jobs promised "killer graphics". Aqua featured new icons that looked just like real-life objects. The Mail app icon was a postage stamp, the Settings app icon was a switch on a board, etc. Nothing really new from what icons looked like before, but this was the first time that icons were in high definition and looked 3D, compared to illustrations or vectors. There was a big work on shapes, lightning and textures.

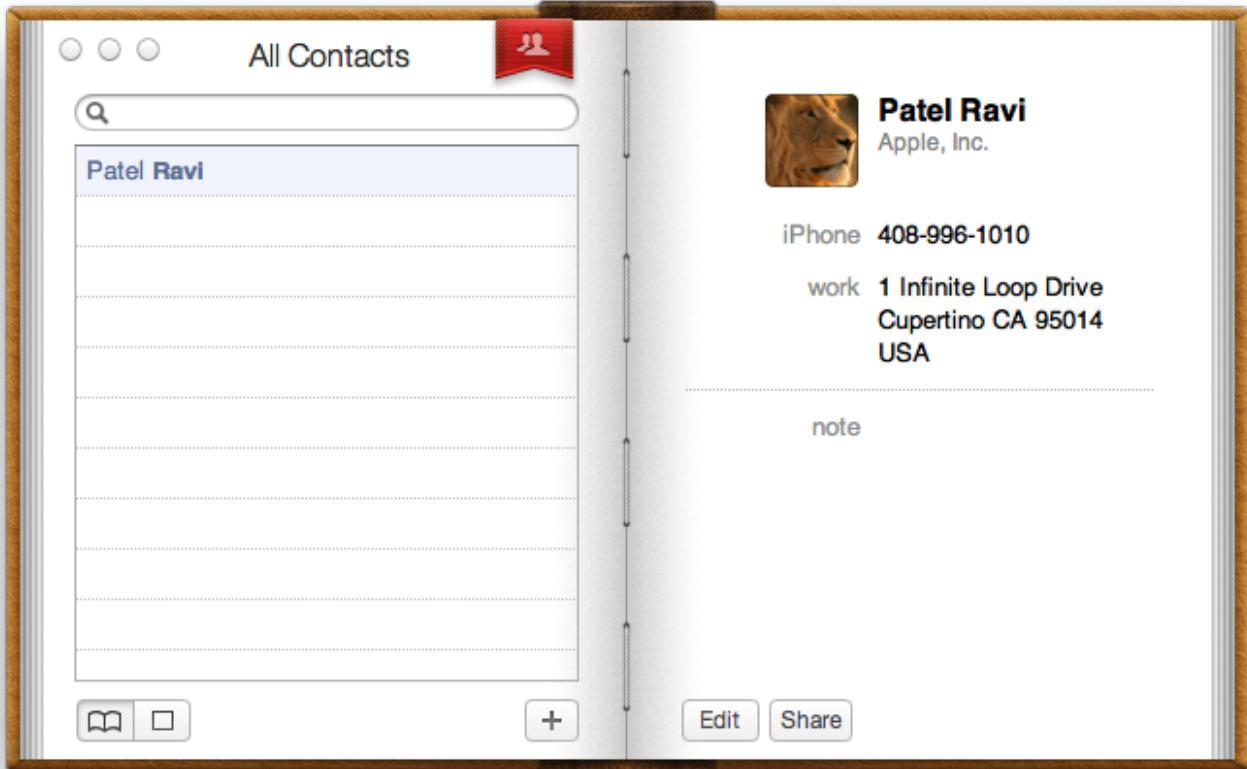


Some apps's backgrounds use metallic textures, like the QuickTime 5 video player. It uses a brushed aluminum texture all around, that later traveled to the entire operating system.



Speaking of texture, early versions of Mac OS X had a pinstripe texture that can be seen throughout the entire OS. Each new version will bring more and more skeuomorphic design elements.





The new iMac G4 came out in 2002 with this new version of the Mac OS. It featured a clean design that let the UI speak for itself. And the UI being that texture, gave the illusion that people were interacting with real object and materials, erasing the fact that the computer was an electric device computing zeros and ones.



Acoustics

Speaking of sounds, Aqua brings so many new high quality sounds, from the start chime to the UI sounds.

Motion

Aqua brings so many new system wide animations. Icons bounce when loading from the dock, windows are squeezed into the app icon's on the dock when minimized and reopened (Genie Effect), Magnification of the dock, ...

iPhoneOS

Developer: Apple Computer

Period: 2007-2013



In 2007, Apple shook the world by announcing their take on the mobile phone. The iPhone had a distinct industrial style; it looked simple, minimalist and fancy compared to other mobiles at the same time. It brought a distinctive design that was about to inspire many other companies for the years to come.

Visuals

Based on Mac OS X, iOS used lots of design cues from its desktop counterpart, all while having its own aesthetic and user experience.

Acoustics

One of the most known iPhone ringtone is Marimba.

Motion

Because of how new this type of multitouch interface was, Apple had to make animations for people to understand what was happening in the palm of their hand. When you tap an app, it scales to the screen to reveal the app, and when you close it the UI gets smaller and scales back to the app icon. Today, that kind of interaction feels normal, but back then the majority of phones didn't use transitions because it was gimmicky and took too much power.

Android Skins

Developer: Google, Samsung, HTC, etc.

Period: 2007-2013

It wasn't until 2008 that the first third-party OEM, HTC, announced their first Android powered mobile phone. After that, many other OEMs felt the need to jump on the smartphone train and take their part of the cake. Android is an open-source software, and OEMs can develop their own look and feel. So naturally, not every Android phone has the same IUI design. For this case, I will analyze Android Skins in general and not specific to each OEM.

talk about Apple Inc. v. Samsung Electronics Co. - Patent Infringements, smartphone wars.

Visuals

Phone manufacturers were all making smartphones before, but when apple unveiled the clean and minimalist UI of the iPhone, they started taking notes on how they can make their interfaces more skeuomorphic, especially on touch screens.

htc

10:08 AM

10
AM

08

Barcelona
Mostly Sunny



Tue, Feb 16

12° H: 16°
L: 10°



Messages



Mail



Internet



Camera



Phone





Having analyzed three cases before, you kind of see the same design codes we've already seen before.



3:00 PM

03:00

PM

Wed.

08/24

103°F 104°/81°

Tucson
Sunny

AccuWeather.com

08/24 2:12 PM



Speed Test



Twitter



Camera



Maps

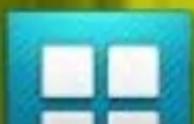


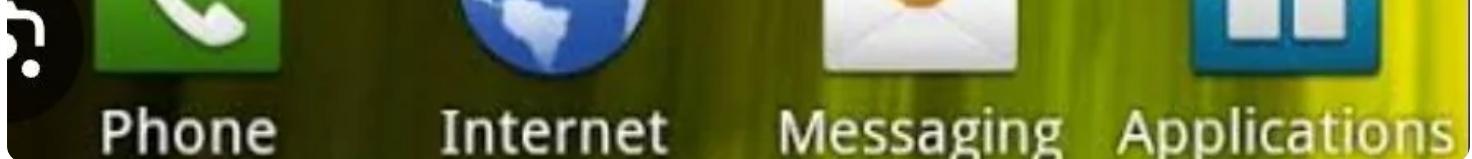
Market



Gmail

1





Samsung who was already making phones jumped on Android and designed their Look and Feel UI called TouchWiz. And in 2011, they were sued by Apple over patent infringement.

Acoustics

Same as the iPhone.

Motion

Extravagant animations compared to the iPhone.

Windows Phone

Developer: Microsoft

Period: 2010-2020

As a bonus, I wanted to talk about Windows Phone, the forgotten mobile operating system that "didn't have apps". Windows Phone was a modern successor of Windows Mobile (2000-2013), that positioned itself as an alternative to the two other mobile OSs already on the market, iOS and Android, by bringing a fresh and different UI and UX to the small screen. Windows Phone 7 marked the first move to flat design in UI design.



Visuals

text

Acoustics

text

Motion

text

Usability and Accessibility

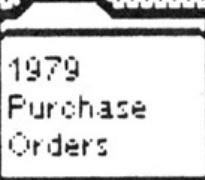
Metaphors

In the 1980 and 1990s, metaphors were being discussed in Human Computer Interaction as a way of democratizing computers by using words everyone knew, mainly in business environments; Desktop, Folder, File, Trash Bin, ... A reason for that was that computers were initially work equipment, but at the same time these were also words everyone already got the concept of.

Metaphors also benefit from mimeticism, as lots of icons and layouts mimic their real life counterparts. The icons designed for the Xerox Alto give a really bold business setting through its UI, with cabinet files, mail baskets, folders, ... because computers were business machines.

Tested Icon Sets

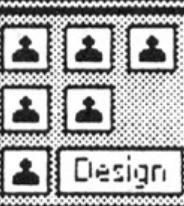
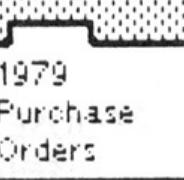
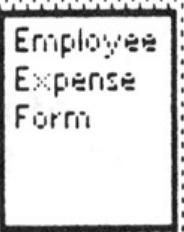
Set 1



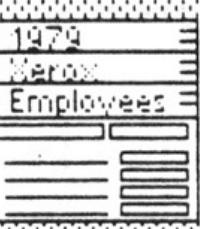
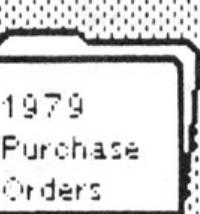
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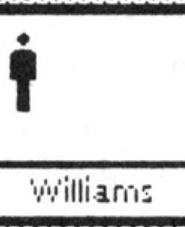
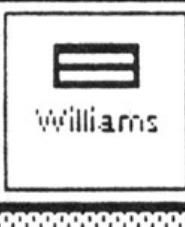
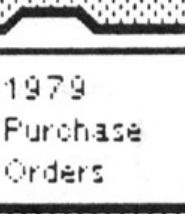
Set 3

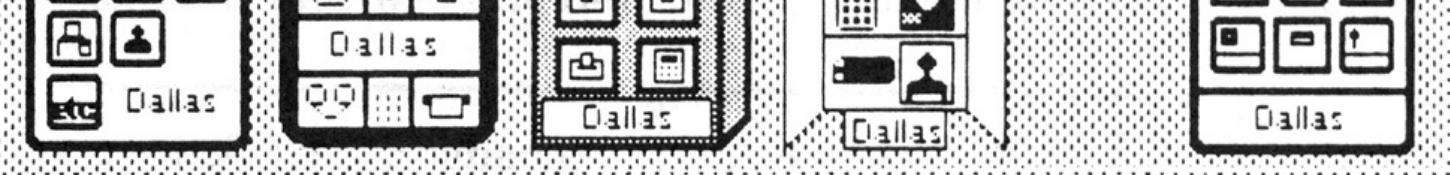


Set 4

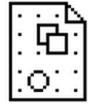
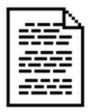


Final versions
of chosen set





Apple won't ask Susan Kare to design icons for the first Apple computer with a GUI (Apple Lisa), but will ask her to design icons and typefaces for the upcoming Macintosh. Kare will kick start the icon design job, by illustrating programs and tools by an image. The icons ditched the mega-business style for a more friendly and more appealing visual style.



Chicago

Aa Ee Qq

Rr Ss Tt

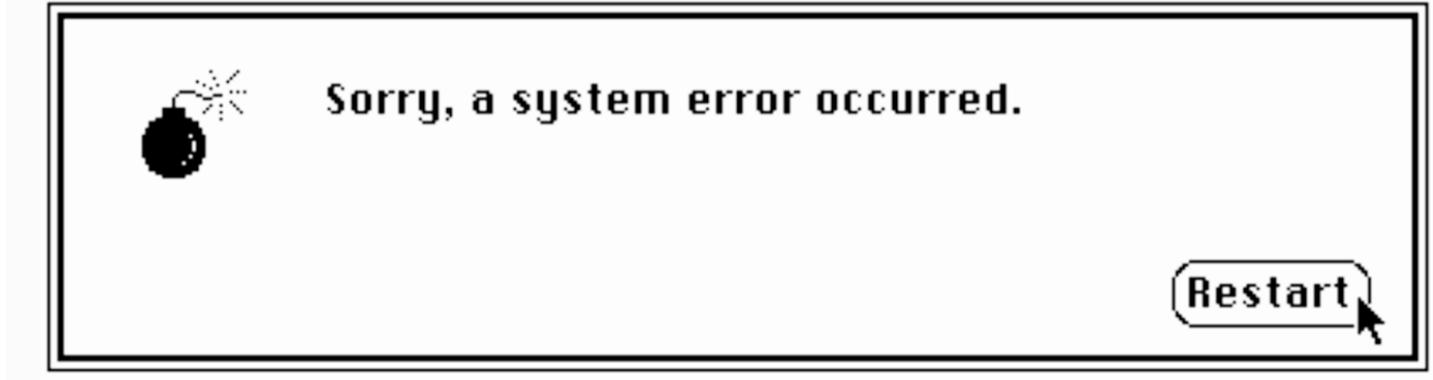
a
q

Insert disk

a b c d e f g h i j k l m
n o p q r s t u v w x y z

0123456789

Although these icons were relatively new and user friendly, people sometime mistook them for other messages, like the dialog that shows up when any program crashes. People saw a bomb and kept calling Apple complaining that their computer was about to explode.



Affordances

"See that door handle? How do you know you have to pull it?"

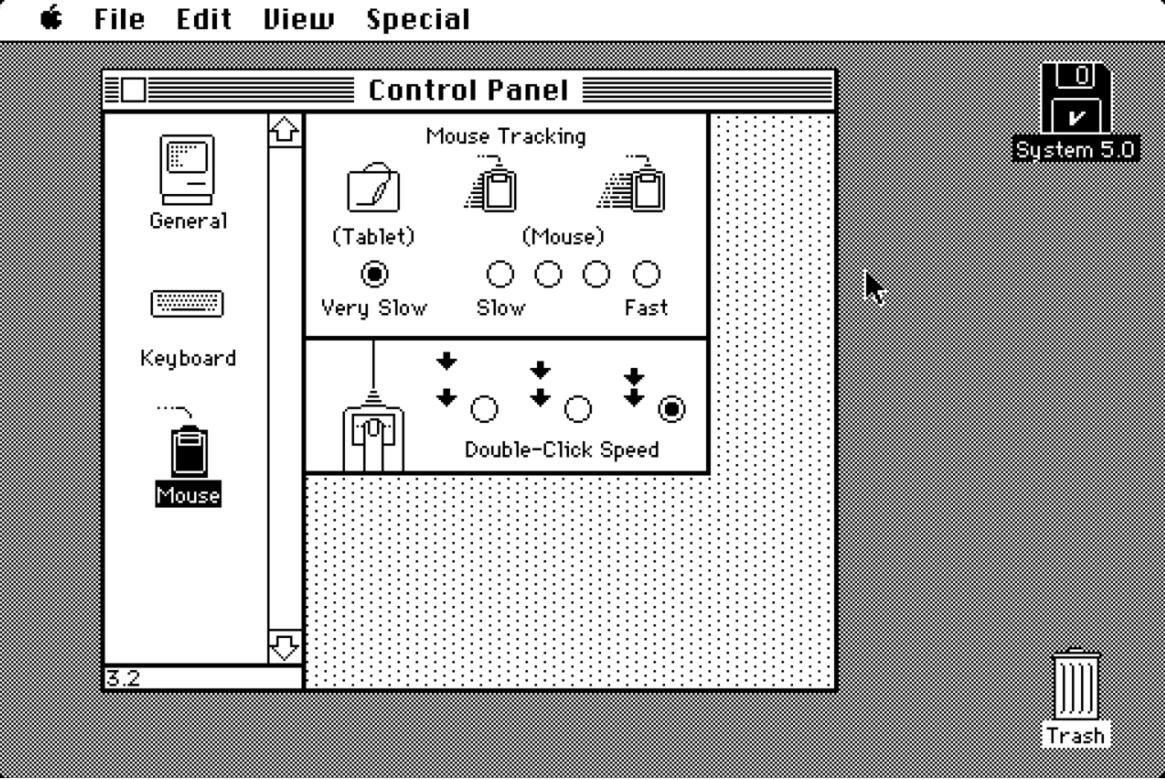
"Do you see the button on the blind's remote? How do you know you have to press it?"

After explaining the concept of Affordances to the people I interviewed, many attested, without me asking, that phones and computers they use today have lost some affordances in their respective user interfaces. I couldn't disagree with them as multiple studies show that Skeuomorphism was winning in terms of accessibility.

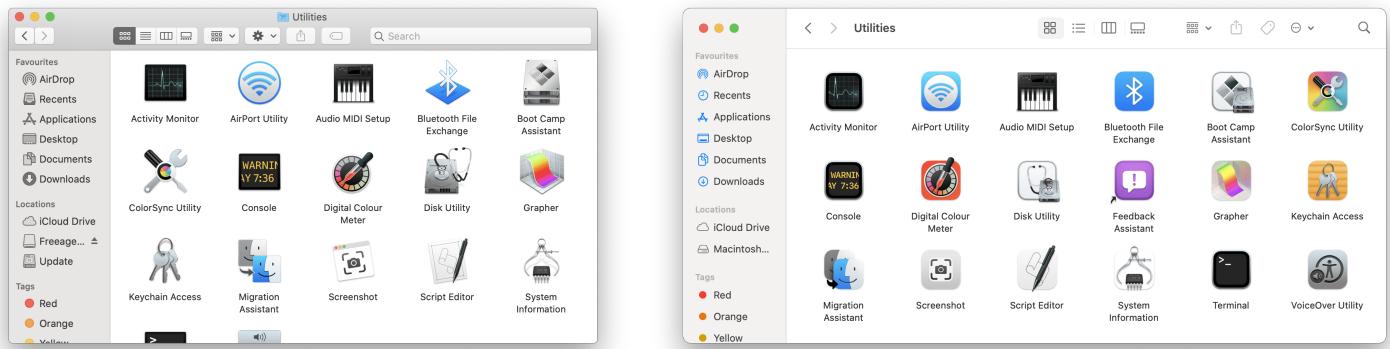
Shadows are another element that is deemed important in the perception of affordances. Giving small shadows to a button makes it afford pressing and not moving acting as a unitary object.



But giving a long shadow to a bigger object like a window makes it look like its floating on the desktop, and makes it afford moving. Of course, that affordance is the result of the title bar affordance. In the first Macintosh OS, the title bar had a pinstripe texture that afforded grabbing in order to move the window.



Today, we don't see this big title bar difference in texture from the window because of how this interaction gesture became the norm and people got used to clicking and dragging the top of any window.



But, same question as for the metaphors, how do you make current user interfaces intuitive when "everyone gets it now"? how do new generations tackle interactions with tech devices?

Scroll bars are also interesting, William Gaver also talks and compares the early Macintosh GUI to the Xerox Smalltalk GUI where he says that "dragging is a natural progression of grabbing". We see less and less of wrong affordances in today's UIs.

here I talk about sequential affordances

here about audible affordances (conveying information about an affordance that can't be seen)

To end this chapter, let's not forget that the actual perception of affordances will be determined in part by the observer's culture, social setting, experience and intentions. (ref. William Gaver). Designing user interfaces for a Western market is so different than designing user interfaces for the Japanese market for example. When looking at Japanese user interfaces, westerners can see cluttered interfaces that feel overwhelming.

Nostalgia

Simpler Times

We tend to think that "Before, things were always better", can that be true in the case of UI design? During my user tests, a person I interviewed found the iPhone 5's Settings app to be so uncluttered and simple compared to today's version, that it felt empty. It seems that user interfaces have gotten so complicated with time, all while getting flatter visually; "An abstract thing like software was just more easier when everything resembled real world objects". Unlocking my iPhone and opening the settings app, I found myself overwhelmed by the amount of settings, colors and texts. Although we have so many functionalities because of these OSs age and improvements that came with it, we probably have too much choice and features that we probably don't fully utilize.

Legacy

(How does Skeuomorphism's legacy influence today's UI design.)

We've been through Skeuomorphism and switched to Flat Design because of how cluttered and kitsch everyday user interfaces became, but also because of the explosion of app marketplaces with developers all bringing their apps with their own style and take on skeuomorphism which led to visual saturation. Flat Design seemed like a solution, by stripping away all details, textures, 3D effects, and any other visual "pollution".

Recently, the resurgence of 3D in UI design really challenged our Flat Design saturation by bringing something new, breaking away from the flat and minimalist looks but maintaining a sense of restraint on exaggeration.

One attempt at that was Neumorphism, that focused on introducing subtle skeuomorphic elements. This style had big problems like having low contrasts and bad clickability detection causing bad reception; this style never made it mainstream.

Some designers even design UIs that are not made to be functional but are more reinterpretation works of art, devoted to waking emotions and feelings up from people.

Finally, skeuomorphism's legacy can also be considered sociological thanks to one of the most fascinating design styles of the 2000s and its naming; Frutiger Aero.

An Unrealized Future

Frutiger Aero is a broad design style and aesthetic attributed to the post Y2K era, that can be found in advertising, media, technology. Invented by Sofi Lee, the name Frutiger Aero is named after the famous typeface designer Adrian Frutiger (creator of the famous and copied Frutiger humanist typeface) and Windows Aero (the GUI of Windows Vista and 7). And according to the Aesthetics Wiki, it is sometimes referenced as Web 2.0 Gloss, and contains many sub-aesthetics and related aesthetics like Frutiger Metro, Technozen, Frutiger Eco and Helvetica Aqua.



This categorization is pretty interesting as it puts a name and a period on a design style that is too soon to be named, compared to other historical design and art time periods. This style became viral in 2022 on social media, especially TikTok, and sparked a subreddit with nearly 70k members, at the time of writing.

According to people who fancy the style, they believe that Frutiger Aero is all about a future that was promised to us but never delivered, especially as Gen Z people who grew up with all these graphics that merged nature elements, fluid shapes, floating elements and technology. Humans fantasizing on merging nature and technology expressed it through these designs of what we call Frutiger Aero today.

I believe that Frutiger Aero is a direct result of nostalgia. As a Gen Z person, I do feel a bit nostalgic because I grew up with these colorful and dynamic design trends, that a big chunk of people from my generation experienced. And I kind of miss them, in a way.

Conclusion

What's Next?

AR? VR? Apple started incorporating some of its design elements from the Vision Pro OS into its mobile OS UI.

Practical Project

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