

10 Interface: UI, UX, HCI, and user testing

Interface design is an essential component of any digital project. The interface is the place where a user accesses, uses, and interacts with the features of a digital project. Interface can be organized through the display of contents, the specification of actions, or a combination of the two. User testing is essential to be sure the design is working effectively across the different populations the project is meant to serve, including those with various physical limitations. ADA compliance guidelines are useful in helping to assure accessibility. See ADA, American with Disabilities Act (<http://www.w3.org/WAI/standards-guidelines/wcag/>).

10a Interface basics

Bonus content: history of interface

The development of the Graphical User Interface and Tactile User Interface took time, experimentation, and vision. In the early years of mainframe computing, the “interface” through which operators provided programming instructions consisted of huge banks of switches. Real-time interaction with computational operation became possible in the late 1960s with command-line interfaces that consisted of lines of text on a screen. Graphical interfaces appeared in the 1980s and early screen resolution was very low so that the graphics had a conspicuous pixelated effect. Designing for these environments took imagination and skill to establish the icons (folders, files, trash cans, etc.) that are now part of our daily workflows.

When pioneer Doug Engelbart was starting to design the mouse (the first working prototype was built around 1968), he was also considering foot pedals, helmets, and other embodied aspects of experience as potential elements of the interface design (Engelbart 2008–20). Why didn’t these catch on? Or will they? Various augmented reality applications for handheld devices, VR glasses, and helmets have also come and gone and been improved through innovation, while sensor-based and distributed technologies are increasingly present in the built environment. What happens to interface when it moves off the screen and becomes a layer of perceived reality? The possibilities for the use of cultural heritage materials are constantly unfolding. (Lineback n.d.) [See Exercise #1: History of interface.] (Ponamariov n.d.).

Look at the major milestones in the development of interface design and think about which features have been preserved and which have become obsolete. These are merely the physical/tactile features of the interface. Here are two useful sites:

1. The History and Evolution of Interfaces (<https://medium.com/design-bootcamp/the-history-and-evolution-of-interfaces-865f3e728f89>) (Alyavdin 2023)
2. A special case: A design disaster? The famous case of Microsoft Bob is now considered a disaster. Why? And would it be received differently today? See Microsoft Bob Version 1.0 (<http://toastytech.com/guis/bob.html>). (Lineback n.d.).

Exercise 10.1: Jesse James Garrett

Analyze Garrett’s diagram “The Elements of User Experience” (<http://www.jjg.net/elements/pdf/elements.pdf>) and see if you can understand the elements and their relationship to each other. Why does he distinguish between Web as “software interface” and “hypertext system”? Would you need to modify this diagram to include elements of current interface design that were not used in 2000?

How-to example

The gray pillars along the sides of Garrett’s chart attempt to address the differences when thinking of the visual design in terms of “software interface” and “hypertext system.” As it states in the note above the graphic,

The Web was originally conceived as a hypertextual information space; but the development of increasingly sophisticated front- and back-end technologies has fostered its use as a remote software interface. This dual nature has led

to much confusion, as user experience practitioners have attempted to adapt their terminology to cases beyond the scope of its original application. The goal of this document is to define some of these terms within their appropriate contexts, and to clarify the underlying relationships among these various elements.

Jesse James Garrett’s “The Elements of User Experience” (<http://www.jjg.net/elements/pdf/elements.pdf>) remains a cornerstone in user-centered design, but modern interfaces have evolved since its publication in notable ways. Mobile and responsive designs have become essential for interoperability across different devices. Due to significant court cases, Web designers recognize the need to adhere to Web Content Accessibility Guidelines standards to ensure experiences are accessible to and inclusive of users with disabilities. User-centered AI and personalization have become integral, using machine learning to adapt interfaces based on user behavior and preferences. Voice, gesture, and immersive interfaces are more prevalent, with the rise of voice-activated assistants, touchless interactions, and XR hardware. Microinteractions and feedback mechanisms enhance user experience with subtle animations and guidance. Additionally, dark mode options and customizable themes are offered to reduce eye strain and meet user preferences. However, the development of these experiences still generally falls within the framework that Garrett provides. For example, when considering Information Architecture, which, according to Garrett’s chart, refers to “structural design of the information space to facilitate intuitive access to content,” this would include writing alt text for every image or chart on a website, so that screen readers would be able to provide clear descriptions to users.

Exercise 10.2: Compare interface designs

Each of these sites focused on documents, but each has a distinct style, organization, purpose, and contents:

- China Unofficial Archives (<https://minjian-danganguan.org/>)
- The George Eliot Archive (<https://georgeeliotarchive.org/>) focused on a single British author
- The Iraqi Jewish Archive (<https://ijarchive.org/s/iraqi-jewish-archive/page/home>)
- The real face of White Australians, a cultural project (<https://www.realfaceofwhiteaustralia.net/>)

Identify the style features of each and describe how they communicate the substance, tone, and authority of each site. What are the ways in which each tells a story? What is the narrative of the content as well as the site organization? How do the two work together—or not?

How-to example

The China Unofficial Archives (<https://minjian-danganguan.org/>) establishes its tone using a subdued color palette, display of highlights, and a button for the user to “Explore the Collection.” The “About” feature allows the viewer to identify the developers of the site, assess their credentials, and understand the basic argument of the site as announced on the landing page. The use of two scripts and languages makes clear that this material is aimed at Chinese readers, not only English-language readers. The collection of documents is eclectic but is all evidence in support of the central theme of “Chinese people seeking to reclaim their country’s history.” The seriousness of the project is reinforced by the absence of decorative elements.

The George Eliot Archive (<https://georgeeliotarchive.org/>) brands its identity with a detail of an oil painted portrait of the American author. The site is a thorough introduction to the work of an important 19th-century woman novelist. The top-level menu lists categories of information available on the site. Each label has a drop down menu that describes the contents and each of these leads to substantive and comprehensive materials for study including interactive data (chronology, maps, and AI engine to assist in exploration), published and unpublished writings, images, and critical commentary from her contemporaries and into the present. The information about the project clearly states the credentials of the project team.

The Iraqi Jewish Archive (<https://ijarchive.org/s/iraqi-jewish-archive/page/home>) exhibit tells a succinct tale that is structured as a series of panels moved through with an arrow. Each panel has a vivid image, a clear informative text, and the whole exhibit sits within the larger framework of the repository. Viewers can return to the archive and explore the other themes in the menu bar, such as Text & Heritage, or Personal & Communal Life. This is a structured narrative experience. The narrative is kept in view by the consistency of the framing, color backgrounds, the directional arrows, and a single directed experience of viewing.

Invisible Australians (<http://invisibleaustralians.org/>) is a repository of powerful stories. These are “discovered” through a gallery of faces, and each individual story is presented as a profile of someone whose identity was erased. (Figure 10.1).

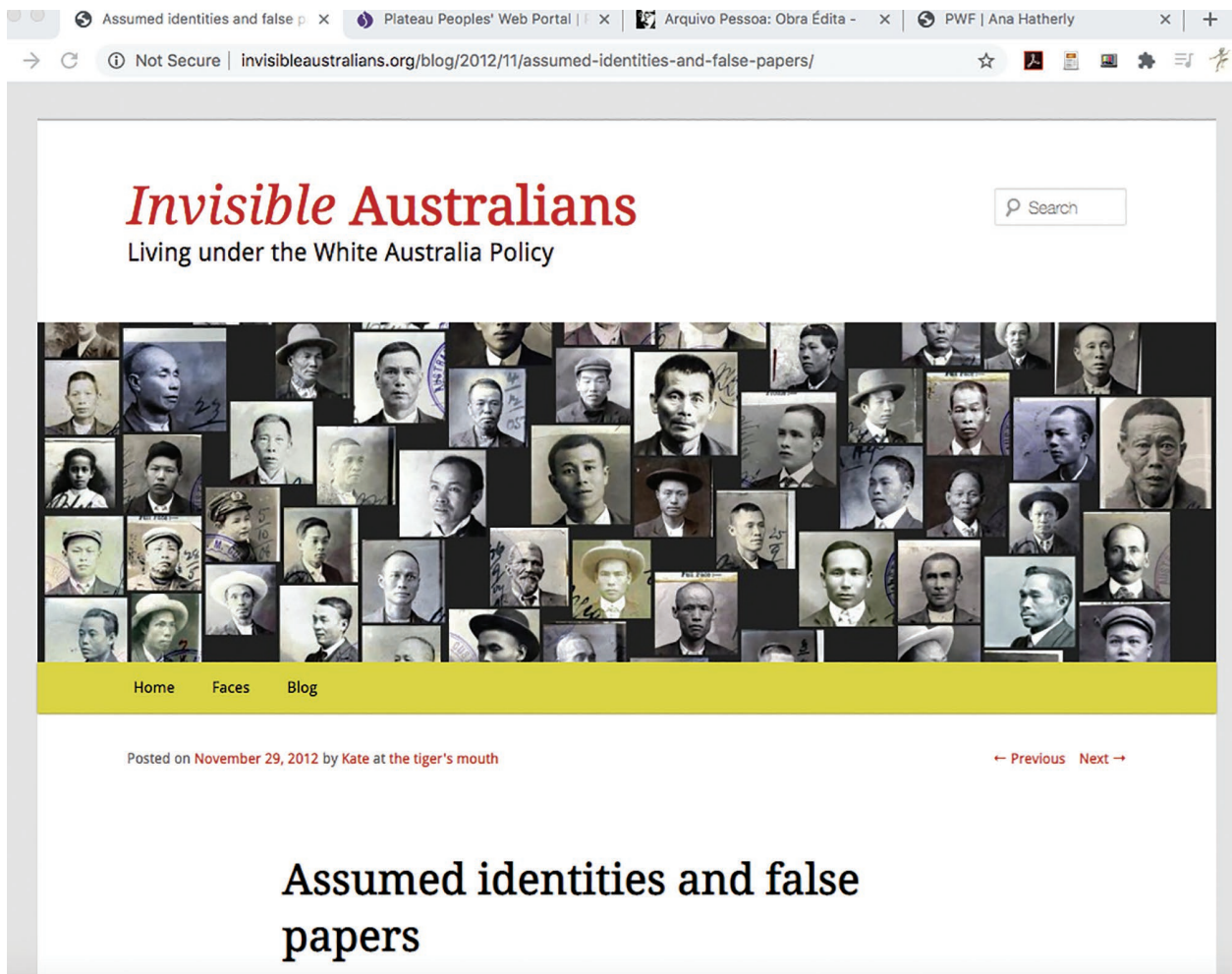


Figure 10.1 The Invisible Australians project (now renamed the Real face of White Australians, <https://www.realfaceofwhiteaustralia.net/>) (Image with permission of Tim Sherratt and Kate Bagnall, Invisible Australians: Living under the White Australia Policy, <http://invisibleaustralians.org/>).

Exercise 10.3: Consumers vs. users

Ben Shneiderman is one of the major figures in the history of interface and information design. He has Eight Golden Rules (<https://www.cs.umd.edu/users/ben/goldenrules.html>) of interface design. Use these rules to assess a website of your choice and then consider whether you would modify the rules or the site.

How-to example

Consider the contrast between a consumer and a user. Begin by looking at Ben Shneiderman's Eight Golden Rules. These are highly regarded and much cited in the realm of interface design. However, depending on what types of website is picked, one question is whether Shneiderman's rules work as well for engaging with a rich digital humanities project like the Tibetan Himalayan Digital Library or George Eliot papers (<https://georgeeliotarchive.org/>) as they do for shopping or browsing entertainment sites. How would you describe the difference between Amazon and Project Gutenberg (<https://www.gutenberg.org/>) in terms of Shneiderman's guidelines? Are they equally effective in both instances?

Exercise 10.4: Designing an interface

Pick a familiar collection of objects, images, media, documents, or other materials, such as your family archives. If you were creating an online repository, how would you structure the site? Think about the hierarchy and what is the top-level organization. If you want to include historical materials, family trees or genealogical records, videos of key events, a recipe collection, or treasured objects, how are they related to each other? Consider the relation between the front-end (themes, topics, categories) and back-end (images, text files, video). How do you tell the story of the family?

By individuals, sub-groups, or chronologies? How will you brand your site? What is the style and feel of the interface and how does it communicate something about your family's identity or values? Sketch all of this on paper, whiteboard, or in an easy-to-use platform like PowerPoint.

How-to example

Start by thinking about what narrative(s) you want to tell and what narrative(s) your material will support. For example, imagine a website that focuses on the culinary history and traditions of a family. In addition to recipes (perhaps various versions of the same recipe shared over the years), there might also be images and videos of family meals. Look to other food and recipe publications for presentation ideas. Do you transcribe the recipe documents or are they presented as images? Perhaps both? How do you handle people associated with the recipes? In terms of content organization, are the recipes the main focus? Various family members? The visual images of various dishes? Are you only going to address your family's histories and traditions or will you expand to include research into related cultural food traditions? Create an entity relationship diagram to map out how information should connect. Create a website wireframe to then consider how those connections are presented. Not sure what a wireframe is or how to build one? Watch this informational video on wireframing (<https://youtu.be/I2N7VI6IOVc?si=W7r0fmcNRQUnmcKG>) and consider using a tool like Balsamiq (<https://balsamiq.com/>).

Bonus exercise: interface to activity

Conceptualizing the relationship between functionality and graphical vocabulary looks intuitive after the fact, but try imagining an interface for an activity like dancing, cooking, or gardening and consider how you could signal actions to be taken through a set of tiny graphical images.

Interface to gardening:

- What is in the top-level menu bar? Are you providing information about how to garden or a portal for resources about gardening activities and expertise?
- Do you organize your site by location/climate zones, by plants, by size, by style, by soil or by tasks to be done in planning, preparing soil, planting, maintaining, and renewing your garden?
- Or is it the purpose of the garden that is at the top: food, decoration, education, soil preservation, plant conservation?
- What kinds of visual materials will you need? Images? Diagrams? Videos? Charts and graphs? Will these be interactive or static?
- What kinds of icons will create a consistent guide for your users? How will you brand the site?

Bonus exercise: digging into data

Many early humanities projects developed substantial research content but did not have effective interfaces. A project sponsored by the American National Endowment for the Humanities, "Digging into Data," was created to make these contents available through new interface designs. One of these, the records of the Old Bailey court, the longest continuous record of legal activity in Britain, was enhanced when a list of crimes, date spans, gender and age of criminals, and punishments was provided. The result was a filtered search that guided researchers into the specific cases. The Old Bailey project (<https://www.oldbaileyonline.org/>) had been in development for years, but its humanist scholars were not accustomed to thinking in terms of interface design. How would you search without drop-down menus? What AI-assisted searches can you imagine doing if that capability were added?

How-to example

The Old Bailey court data could be presented as an interactive data dashboard where users are presented with charts and graphs that show an overview of the data, which can then be filtered, sorted, and searched by users.

However, with the use of new AI tools, you could set up a character AI profile (see examples such as Talkie (<https://www.talkie-ai.com/>)) with the data for each person featured in the dataset. Users could then "chat" with that "person" to learn more about the trial associated with them and the outcomes.

Recommended readings

- Paneru, Biplov, Bishwash Paneru, Ramhari Poudyal, and Krishna Bikram Shah. 2024. "Exploring the Nexus of User Interface (UI) and User Experience (UX) in the Context of Emerging Trends and Customer Experience, Human Computer Interaction, Applications of Artificial Intelligence". *International Journal of Informatics, Information System and Computer Engineering (INJIISCOM)* 5 (1): 102–3. <https://doi.org/10.34010/injiiscom.v5i1.12488>.
- Seberger, John. 2020. "Bridging DH and Humanistic HCI." *Sustainable Digital Communities*. https://doi.org/10.1007/978-3-030-43687-2_72. https://www.researchgate.net/publication/340024455_Bridging_DH_and_Humanistic_HCI.

10b Style, ethics, AI innovations, and user testing

Bonus content: critical interface toolbox

The Critical Interface Toolbox (<https://crit.hangar.org/toolbox/>), a resource for critical interface design, outlines a number of key principles for thoughtful and ethical interface design. They stress the extent to which interfaces conceal their ideology and value systems. The toolbox addresses topics such as Internet physicality, geopolitics, data privacy, algorithmic politics, and hacktivism. The resource emphasizes the need to read an interface for what it conceals as well as how it works in the visually present form.

Exercise 10.5: Best and worst designs

Look through the Best and Worst Interfaces (these appear on various sites) and analyze the triumphs and disasters that are collected there. Someone designed each of those thinking they worked.

- <https://webflow.com/blog/best-websites>
- <https://colorlib.com/wp/bad-websites/>
- <https://kijo.co.uk/blog/worst-websites-bad-design-examples/>

How-to example

Difference between style and function is really important. Is it good in terms of how it works or how it looks? Create a matrix of assessment criteria to help you evaluate across form and functionality. Something can look outdated but function really well; other sites may look beautiful, but not operate to optimize the user experience.

Exercise 10.6: Design trends

Design trends are always changing and keeping up with industry fashions is fun but should not drive designs. Trends tend to get out of date more quickly than more conventional designs built around functionality. Which of these trends described in this blog (<https://procreator.design/blog/top-trends-user-interface-design/>) would you add to the Serpentarium Mundi project and the Digital Transgender Archive? Do the style features make sense for humanities research and if so what do they add?

How-to examples

Serpentarium Mundi project (<https://www.serpentarium.org/index.html>)—Consider the UX/UI discussion within this review of the project. The color palette is already fairly muted and could be adjusted slightly and some shallow shadows could be added around a few additional elements to bring it more in line with a Neumorphism style. If the designer shifted from a serif font to a sans serif font, the site would begin to feel more contemporary. The site presents tabular data in a static way. Shifting information into a database, which can be accessed through an API could be a way to simplify the design and allow for more dynamic browse and search in terms of user interaction.

Digital Transgender Archive (<https://www.digitaltransgenderarchive.net/>)—Consider the UX/UI discussion within this review of the archive. While the site doesn't contain most of the trends mentioned within the blog, the many different search functionalities (via maps, institutions, topics, etc.) and the variety of additional learning resources (glossary, media collection, primary sources set, etc.) make it a powerful humanities research tool.

Bonus examples

Walt Whitman Archive (<https://whitmanarchive.org/>)—The engraving is skilled, the product of a practiced technician in an era when these images were a part of visual culture. The style of the site looks dated, very early 2000s. The site is organized by types of things relevant to the poet's work—published materials, manuscripts, biographical material, and so on. The story of the site is the focus on an individual figure, a monumental personality of American letters in the 19th century. Included are studies of such unusual materials as an enormous geographical scrapbook put together by Whitman. A special Scrapbook Page Viewer argues, by its presence, that this is a very important object. The ability to move through the entire scrapbook, zoom into its details, and examine the many pieces of its composition reinforces this argument.

The Poetess Archive (<https://poetessarchive.org/>)—delicate color, the songbirds, a serif typeface, and background frame tint. It starts with a "Welcome" statement, speaking to the viewer. News items are posted, to give a sense of where the project is in its own development (note that the last updates were in 2017), and then the tabs invite the viewer to search the materials in the site. The story is mainly contained in the welcome frame, after which, viewers are free to search and browse. A new interface is in design production in Fall 2020, so comparing it with the example above will be useful to see what new functionalities are indicated and how it guides the experience of a researcher.

Exercise 10.7: Cross-cultural design

See <https://mukurto.org/>. How does this platform make its mission clear? What features are built into the software and interface to control access and create a space for communities to reclaim their cultural heritage and identity?

How-to example

The content management system (CMS) CMS is designed with features that specifically address deficiencies in more “traditional” platforms, such as Traditional Knowledge Labels that enable Indigenous communities to add their information to other data models and access levels to ensure granular-level permissions for sensitive or sacred content. In addition, items can have more than one record, so that multiple cultural perspectives can contribute simultaneously and without hierarchy. Finally, there are easy import and export tools, allowing for easy control of all your data. Read the About page (<https://mukurto.org/about/>) for more information and take a closer look at some of the projects available in the showcase (<https://mukurto.org/project/plateau-peoples-web-portal-showcase/>) to examine these features in more detail. For example, the Plateau Peoples’ Web Portal (<https://plateauportal.libraries.wsu.edu/>) is a collaboration between multiple tribes in the Northwestern United States and the Center for Digital Scholarship and Curation at Washington State University, which has a public front and a login for contributors and various partners and users. The interface allows users to show records in different indigenous languages and arrange content in list, grid, or map views, and sort collections by relevance, date, or alphabetical order. Murkurtu redefines traditional platforms by prioritizing Indigenous knowledge systems, fostering inclusivity, and offering advanced tools for data management and accessibility.

Exercise 10.8: User testing

Take a look at some examples (<https://dogq.io/blog/ui-testing-guide/>), and then create a step-by-step scenario for testing a specific website that you find useful in your investigation of a topic with which you are familiar. Identify the structural and behavioral features, create a set of goals for specific users, and determine how you would assess whether the design supported the users’ expectations.

How-to examples

Step-by-step script for testing.

Testing location of an object or document:

1. search for item,
2. identify category,
3. navigate to list or index,
4. select item,
5. examine,
6. return to intermediate level catalogue or list,
7. continue research,
8. locate citation information,
9. preserve URL or location.

Test contact on the site:

1. find the about information,
2. identify the partners,
3. assess the credentials of the team,
4. find the contact information,
5. understand the protocol for communication,
6. communicate with the developers/researchers,
7. anticipate response time,
8. assess response accuracy and appropriateness to the query.

Exercise 10.9: Features of AI interface

What kinds of AI features would you integrate into the platform you just used for user testing? What results would you expect or like to see and how would you want them to be generated—by text, image analysis, 3D imagery, interactive charts, maps, or diagrams, or voice/audio reports? Why?

How-to example

Read the following articles about AI design and consider the various perspectives:

Schmidt, Christian Marc. “Shaping the Future of AI Interfaces.” Schema Design Studio, March 18, 2024. <https://medium.com/schemadesignstudio/shaping-the-future-of-ai-interfaces-f23882100aef>.

- In this article, “Shaping the Future of AI Interfaces” by Christian Marc Schmidt prompts readers to imagine AI interfaces beyond the text and voice ones we are familiar with at present, and question if AI interfaces could bebut... “understandable, discoverable, and actionable?” Consider the Maybe, “adaptive landscapes” model he proposes.

Lipiński, Damian. “Designing AI Interfaces: Challenges, Trends & Future Prospects.” Pragmatic Coders Blog, August 13, 2024. <https://www.pragmaticcoders.com/blog/designing-ai-interfaces-challenges-trends-and-future-prospects>.

- This article considers the aesthetics of AI interfaces. There has been a strong color trend of purple/purplish gradients and to personify AI, using robots or orbs as iconographic representation.

Wang, Brian. “The Power of Simplicity: Why User Friendly Interfaces are Critical for AI Adoption.” *Next Big Future*, January 21, 2025. <https://www.nextbigfuture.com/2025/01/the-power-of-simplicity-why-user-friendly-interfaces-are-critical-for-ai-adoption.html>.

- In this article by Brian Wang, he argues that the success of platforms like ChatGPT is tied to the simplicity of the UI that doesn’t require extensive technical knowhow to get started. As our AI interfaces develop to serve other tasks, he asserts that prioritizing simple and intuitive interfaces is crucial.

Recommended readings

Burgess, Matt. 2018. “What Is the Internet of Things?” *WIRED*. www.wired.co.uk/article/internet-of-things-what-is-explained-iot.

Burgstahler, Sheryl. 2021. “A Tutorial for Making Online Learning Accessible to Students with Disabilities.” *Disabilities, Opportunities, Internetworking, Technology*. https://www.researchgate.net/publication/349737156_A_Tutorial_for_Making_Online_Learning_Accessible_to_Students_with_Disabilities.

Cardello, Jeff. 2025. “19 Best UI/UX Design Tools to Try in 2025.” *Webflow Blog*. <https://webflow.com/blog/ui-ux-design-tools>.

Editorial Staff. 2024. “Understanding Cross-Cultural Design Considerations in Technology.” *The Tech Artist*. <https://thetechartist.com/cross-cultural-design-considerations/>.

Lipiński, Damian. 2024. “Designing AI interfaces: Challenges, Trends & Future Prospects.” *Pragmatic Coders Blog*, August 13, 2024. <https://www.pragmaticcoders.com/blog/designing-ai-interfaces-challenges-trends-and-future-prospects>

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Norman, Don. 2010. “Natural User Interfaces Are Not Natural.” *Interactions* XVII (3). <https://interactions.acm.org/archive/view/may-june-2010/natural-user-interfaces-are-not-natural1>.

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Tognazzini, Bruce. 2014. “First Principles of Interaction Design.” *Ask Tog*. <https://asktog.com/atc/principles-of-interaction-design/>.

Wang, Brian. January 21, 2025. “The Power of Simplicity: Why User Friendly Interfaces are Critical for AI Adoption.” *Next Big Future*. <https://www.nextbigfuture.com/2025/01/the-power-of-simplicity-why-user-friendly-interfaces-are-critical-for-ai-adoption.html>.

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Digging into Data. <https://diggingintodata.org/>.

Engelbart, Douglas. 2008–20. www.douengelbart.org/content/view/162/000/.

HTML standards. <https://html.spec.whatwg.org/>.

Lineback, Nathan. “Graphical User Interface Gallery.” Accessed May 6, 2025. <https://toastytech.com/guis/index.html>.

Lineback, Nathan. “Microsoft Bob at ToastyTech.” Accessed May 6, 2025. <https://toastytech.com/guis/bob.html>.

Mukurtu. <https://mukurtu.org/>. And <https://mukurtu.org/showcase>.

Old Bailey Online. www.oldbaileyonline.org/.

Plateau Peoples Web Portal. <https://plateauportal.libraries.wsu.edu/>.

Ponamariov, Victor. History of User Interfaces. Accessed May 6, 2025. <https://history.user-interface.io/>.

THDL (Tibetan Himalayan Digital Library). www.thlib.org/places/.

Resources

- User testing guidelines (<https://dogq.io/blog/ui-testing-guide>)
- ADA, Americans with Disabilities Act, Web Content Accessibility Guidelines (<http://www.w3.org/WAI/standards-guidelines/wcag/>)
- Best UI and UX Design Tools for 2025 (<https://www.geeksforgeeks.org/best-ui-ux-design-tools/>)