



REALIGNING LIBRARY USER INTERFACE PLATFORM FOR BETTER DIGITAL EXPECTATIONS

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ABSTRACT

Libraries run back-office and front-office interfaces through both traditional and digital platforms. Rapid advances in digital technology have changed how users search for, consume, and interact with the front-office interface. Drawing on extant literature in information science, human-computer interaction and digital librarianship, this paper argues that an inclusive, user-centred interface offers libraries the best means of meeting their users' digital expectations. The paper examines the weaknesses of current interfaces, sets out a vision for a new interface, and explains why a responsive design matters. It concludes that such an interface keeps libraries relevant, accessible, inclusive, and indispensable, and it directs specific recommendations to library administrators, governing institutions, librarians, and users.

INTRODUCTION

The library serves as a gateway to knowledge that no longer depends on physical walls, card catalogues, or librarians who guide patrons along the shelves. Digitisation has changed libraries by giving users an interface through which they reach services and collections remotely. Yet many libraries that moved to a digital interface neglect to update it, and their users find it outdated, unintuitive, and frustrating. Users expect a library, as a database of knowledge, to work seamlessly, and they compare it with platforms such as Google, Netflix and Amazon, which win users through simplicity.

Despite their vast repositories of knowledge, libraries watch users abandon them for less reliable but more accessible alternatives. This paper contends that this abandonment occurs because libraries treat

the user interface as a cosmetic feature. A poor interface acts as a barrier to knowledge access. Libraries should therefore give interface design the same seriousness they give to collection development, cataloging, and community programming, so that users raised on intuitive, responsive, and personalized digital experiences do not see their expectations dashed.

The discourse has five parts. Three themes, each with sub-themes, examine the library interface, and two closing parts present the conclusion and the recommendations. The three themes are:

1. Underscoring the library interface in a digital era
2. A vision for the new library user interface
3. Making the library interface design responsive



Together, these themes explain why libraries must realign the user interface to be intuitive, responsive, and supportive of a personalized digital experience. The conclusion then draws the themes together, and the recommendations assign specific actions to the people who can carry them out.

1 UNDERSCORING THE LIBRARY INTERFACE IN A DIGITAL ERA

Before this paper proposes a new interface, it must first define the interface and show where current versions fall short. This theme therefore describes the library user interface and then examines four weaknesses: complexity, lack of personalization, poor mobile optimization, and accessibility gaps.

1.1 The Library User Interface Defined

The library user interface (UI) is the point at which a user meets the library's resources. It includes the screens, search tools, menus, labels and services through which a person finds, accesses and uses library materials. Libraries operate two kinds of interfaces. Staff use back-office interfaces for acquisition, cataloging and circulation, while patrons use front-office interfaces to search, borrow and read. This paper concerns the front-office interface, because it shapes how users judge the library.

A good library interface has four characteristics. It is intuitive, so users need no training to operate it. It is responsive, so it adapts to the user's device and needs. It is personalized, so it recognizes the individual user. It is inclusive, so it serves every user, including persons with disabilities. The

sub-themes below show how current interfaces fail on each of these characteristics.

1.2 Complexity and Poor Usability

Usability describes how easily, efficiently, and satisfactorily users can complete their tasks in a system. A system with poor usability forces users to learn its rules before they can benefit from it. Designers built most integrated library systems (ILS) and online public access catalogs (OPACs) in use today for librarians, not for general users. Their search forms often demand knowledge of Boolean operators, Library of Congress subject headings, and catalog-specific conventions that the average patron does not possess.

Research on library user experience indicates that users prefer simple, Google-like search boxes to advanced search interfaces (Cribbs, 2025). This preference makes sense, because users already know how to type a plain query and have no reason to learn a specialist syntax. When complex search forms, drop-down menus and cryptic field labels confront them, many users simplify their query and miss relevant materials, or they abandon the system entirely. We should therefore read this behavior as a design failure rather than a user failure: the system must adapt to the user, not the user to the system.

1.3 Lack of Personalization

Personalization means that a system adapts what it shows to the individual user, based on that person's history, preferences, and context. Its main characteristics are recognition of the returning user, recommendation of relevant resources, and user control over the data the system



collects. Modern digital platforms have conditioned users to expect these features. Streaming services recommend content based on viewing history, e-commerce platforms remember preferences and past purchases, and social media curates feeds based on behavior and interests.

Library interfaces, by contrast, offer almost no personalization. Every user meets the same generic interface, regardless of research history, preferences or discipline (Yang, 2025). This one-size-fits-all approach damages academic libraries in particular, because the information needs of a medical student differ vastly from those of an arts student. A new library UI must therefore incorporate intelligent personalization that adapts to the individual user while respecting privacy and data ethics.

1.4 Poor Mobile Optimization

Mobile optimization means designing an interface so that it works well on a smartphone, with readable text, simple navigation, and layouts that adapt to smaller screens. In Nigeria and across the African continent, mobile phones serve as the primary device through which most people access the internet. Yet many library websites and catalogues remain poorly optimized for mobile use, with small text, difficult navigation, and layouts that do not adapt.

A 2024 survey of university students in West Africa found that over 78% primarily accessed online resources through a smartphone, yet fewer than 30% rated their university library's mobile interface as satisfactory (Nwosu & Adeyemi, 2024). This gap shows that libraries design for a user who no longer exists. Poor mobile

design is more than an inconvenience; it amounts to digital exclusion that falls hardest on students and researchers who depend on mobile access. Mobile-first design is now the standard, and libraries have no justification for falling short of it.

1.5 Accessibility Gaps

Accessibility means that people with visual, auditory, motor, or cognitive impairments can perceive, operate, and understand an interface. The Web Content Accessibility Guidelines (WCAG) provide the international benchmark, covering screen reader compatibility, color contrast, keyboard navigation and alternative text for images (W3C Web Accessibility Initiative, 2023). Libraries have a fundamental obligation to serve all members of their communities, including persons with disabilities.

Asok and Rekha (2025) evaluated leading Asian university library websites and found that a majority still fail to meet even basic WCAG 2.1 thresholds, with low color contrast and missing alternative text among the most common violations. If these well-regarded libraries fall short, we have little reason to expect better from libraries with fewer resources. An interface that excludes users with visual, auditory or motor impairments betrays the library's core mission of universal access.

2 A VISION FOR THE NEW LIBRARY USER INTERFACE

Having identified these weaknesses, this theme sets out a vision for an interface that corrects each of them. The vision rests on five features: unified search, personalized dashboards, mobile-first design, full



accessibility compliance and intelligent assistance.

2.1 Intuitive and Unified Search

At the heart of any new library UI, a single, powerful and intuitive search experience must replace separate searches by format, with books here, journals there and databases elsewhere. The new interface should offer a unified discovery layer that searches all library resources simultaneously. Intelligent autocomplete, spelling correction, and natural language processing should support this layer, so that the system understands what the user wants even when the query is imprecise.

Cribbs (2025) reports that participatory usability research on academic library website redesigns consistently identifies search functionality, discoverability and accessibility as the users' main pain points. This finding suggests that search deserves the first and largest share of any redesign effort. Faceted filtering, which lets users narrow results by date, format, subject, language, and availability, should appear clearly and visually rather than hide behind menus or force users to re-enter their search. The interface should also learn from each interaction and surface the most relevant results based on the user's history and institutional context.

2.2 Personalized Dashboards

The new library UI should greet every returning user with a personalized dashboard: a curated space that shows recently accessed materials, saved searches, recommended resources based on research interests, upcoming due dates, and relevant new acquisitions. In academic libraries, the dashboard could connect to course

management systems and automatically surface the reading-list resources for the user's current courses.

Yang (2025) shows that frameworks combining fuzzy logic with deep learning handle the vague and imprecise preferences typical of real research queries, and that they improve the relevance of resource recommendations over keyword-only search. This evidence indicates that libraries can recommend useful materials without forcing users to state exactly what they need. Libraries must, however, build this personalization on transparent data ethics. Users should control what data the library collects and how it uses that data, and they should be able to opt out at any time. Designers must embed the library's commitment to intellectual privacy, a cornerstone of library ethics, in the personalization system from the start, not add it as an afterthought.

2.3 Mobile-First, Responsive Design

Mobile-first design means that designers create the mobile experience first and build the desktop experience from it, not the reverse. This approach optimizes core functionality for the smallest screen and the most constrained bandwidth, which matters most for libraries that serve communities where the phone is the main point of access, as section 1.4 showed. Mobile-first library design should include large, tappable buttons; simplified navigation with minimal menus; offline functionality for downloaded resources; fast load times for lower-bandwidth environments; and QR code integration that lets users scan a physical item and immediately open its digital record, reviews and related resources.



2.4 Full Accessibility Compliance

Libraries must treat accessibility as a non-negotiable requirement, not an optional feature. The new library UI should meet or exceed WCAG 2.2 AA standards (W3C Web Accessibility Initiative, 2023), which means it should work with screen readers, support full keyboard navigation, provide sufficient color contrast, allow text to resize without loss of function and caption multimedia content. Because the violations Asok and Rekha (2025) found are so common, libraries should also build regular accessibility audits into the interface's maintenance cycle and should involve users with disabilities in those audits.

2.5 Integration of AI and Intelligent Assistance

Artificial intelligence offers transformative opportunities for the library interface. An AI-powered virtual librarian available 24 hours a day, seven days a week could help users refine research questions, navigate complex databases, identify relevant sources and understand citation formats. Unlike a simple chatbot, this assistant should draw on library science knowledge and connect to the library's own catalog and databases.

Chase (2024) and Rodriguez and Mune (2022) report that academic libraries, even with modest resources, can deploy chatbots that reduce routine query loads while directing complex questions to human staff. For libraries in Nigeria, where budgets are tight, this evidence matters: intelligent assistance does not require a large technical team. Libraries must nonetheless approach AI with caution and critical awareness. The AI should complement, not replace, the expertise of human librarians. It should

state its limitations openly, signal when it is uncertain, and always direct users to human help for complex research needs. Librarians must remain central to the AI-assisted library experience.

3 MAKING THE LIBRARY INTERFACE DESIGN RESPONSIVE

A responsive interface responds in two ways. Technically, it adapts to the user's device, screen size and bandwidth. Institutionally, it responds to what users need and say, so that the library keeps improving the interface in light of user experience. This theme explains why such responsiveness matters by examining the relationship between access and utility, the competition libraries face and the equity dimension of interface design.

3.1 Access Determines Utility

Some may argue that interface design is a secondary concern and that the quality and breadth of the collection matter more than the interface through which users reach it. This argument misunderstands the relationship between access and utility. A collection that users cannot effectively access is, for practical purposes, inaccessible.

Consider a hospital with world-class medical equipment housed behind an unmarked door at the end of a confusing corridor with no signage. The equipment is there, and so is the expertise, but if patients cannot find the treatment room, the hospital fails in its fundamental mission. The same holds for libraries: a great collection behind a poor interface is a library that fails its users.



3.2 Competition for Users' Attention and Trust

In an era of intense competition for users' attention, libraries cannot afford to be difficult to use. When Google Scholar, ResearchGate and Wikipedia offer faster and more intuitive access, users choose convenience over quality, even when the content is less authoritative. Libraries cannot respond by simply asserting their authority. They must demonstrate their value through an experience that is both authoritative and excellent.

3.3 The Equity Dimension

Interface design also carries a profound equity dimension. A poor interface deters most those users with the least experience of complex digital systems: first-generation university students, older patrons, users with lower digital literacy and users in under-resourced communities. A difficult interface therefore disadvantages those who already face disadvantage. Improving the library UI is, at its core, an act of equity.

CONCLUSION

The size of its building or the number of items on its shelves will not define the library of the future. The quality of the experience it offers its users will define it, and that experience begins the moment a patron opens the library's door, whether that door is physical or digital.

This paper showed that current library interfaces suffer from complexity, a lack of personalization, poor mobile optimization and accessibility gaps. It then described an interface that offers unified search, personalized dashboards, mobile-first design, full accessibility compliance and

carefully governed AI assistance. Finally, it argued that responsiveness matters because access determines utility, because libraries compete with faster alternatives and because a poor interface deepens inequity. A new interface is therefore not a luxury or a cosmetic upgrade. It is a strategic necessity and a fundamental investment in the library's mission of universal, equitable access to knowledge.

The broader literature on digital librarianship describes a transition from gatekeeper to guide. This transition requires new skills and roles from library professionals, and it also requires new interfaces through which they can express those skills. A librarian who works as a digital educator, research collaborator and knowledge curator needs an interface worthy of that expertise, one that empowers both librarian and patron to do their best work. The time for incremental adjustments has passed. Libraries must commit to a bold, user-centered, equity-driven redesign, and they must do so now.

RECOMMENDATIONS

The three themes of this paper lead to the following recommendations. Each one names the party responsible for acting, the theme it serves, and the people who benefit.

For University Librarians and Library Administrators

1. Conduct comprehensive user research with students, faculty, community members, persons with disabilities and non-native speakers before redesigning any interface element (Themes 1 and 3). Every user group benefits, because real



difficulties, not assumptions, will shape the redesign.

2. Establish a dedicated UI/UX role within library administration and recognize interface design as a core professional competency alongside cataloging and collection development (Theme 3). Users benefit from an interface that someone owns and continually improves.
3. Implement a continuous improvement cycle of launching, measuring, learning and iterating, and treat the interface as a living system rather than a one-time project (Theme 3). Users benefit from an interface that keeps pace with their changing expectations.
4. Prioritize mobile-first development in every future interface project, and test regularly on the low-end devices and lower-bandwidth connections that students actually use (Themes 1 and 2). Students who depend on smartphones benefit most.
5. Mandate full WCAG 2.2 AA compliance for all library digital interfaces, and conduct biannual accessibility audits with the participation of users with disabilities (Themes 1 and 2). Persons with visual, auditory and motor impairments benefit directly.

For Universities and Other Governing Institutions

6. Fund the UI/UX role, the accessibility audits and the adoption of open-source, community-

developed discovery systems that prioritize usability and receive regular updates (Theme 2). The library gains the means to modernize, and users gain a current, supported interface.

7. Require and reward partnerships between the library and the university's computer science and design departments to co-develop and test interface improvements (Theme 3). Students gain practical experience, and the library gains technical capacity at low cost.

For Librarians

8. Lead the ethical introduction of AI assistance: set its scope, review its answers, state its limitations openly and take over every complex research query it escalates (Theme 2). Users receive reliable help at any hour, and librarians keep their central role.
9. Build personalization on informed consent by explaining to users what data the system collects and how to opt out (Theme 2). Users keep control over their intellectual privacy.

For Library Users

10. Take part in usability testing, surveys and feedback channels, and report accessibility and mobile difficulties when they arise (Theme 3). Users make the interface responsive to their own needs by telling the library what works and what does not.



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