



Evidence Based Library and Information Practice

Commentary

Why Are Data so Important to Library Development Today? Implications for Practice

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Introduction

Libraries operate in increasingly complex environments characterized by evolving user needs, economic constraints, and digital transformation. To stay relevant, libraries must embrace data-driven strategies that demonstrate value, enhance service delivery, and support evidence based decision-making. Data are now a strategic asset for library development, informing areas such as service planning, resource allocation, performance assessment, and collection management. Traditionally, library data comprise circulation statistics, reference queries, acquisition records, and user demographics. While useful for operational reporting, these data types provide limited information regarding users' behaviours. As a corollary to this, libraries now generate and analyze more diverse data sources, such as digital footprints, search patterns, system logs, and engagement metrics from integrated library systems and online

platforms (Moses et al., 2023; Scarnò, 2010). These provide better understanding of user preferences, thereby enabling more targeted, efficient, and responsive services.

Data, in this context, refer to any qualitative or quantitative facts gathered through library interactions and systems. Library development denotes the strategic improvement of infrastructure, services, and policies. Evidence based practice is the use of systematically gathered data to inform decisions, enhance performance, and justify resource allocation (Thorpe, 2018). This article, therefore, addresses the question: *Why are data so important to library development today?* It aims to: (i) identify types and strategic functions of library data; (ii) examine their role in driving service improvement; (iii) explore barriers to effective data use; and (iv) outline practical implications for library policy, professional practice, and institutional strategy.

Types and Strategic Functions of Library Data

Libraries generate and manage diverse data types that serve operational, evaluative, and developmental functions. These data are instrumental in aligning services with broader library goals such as enhancing user engagement, improving service quality, managing space effectively, as well as maintaining institutional relevance. Technological advancements have greatly expanded the nature and scope of library data, moving beyond traditional metrics like circulation statistics and user demographics to include digital footprints, user behavioural analytics, and system-generated logs (Adeyemi et al., 2025). These developments enable libraries to design more targeted services, optimize resource use, and support evidence based decision-making. Common types of library data and their strategic functions include the following.

User-Centred Data

This includes demographic information, borrowing histories, user profiles, feedback forms, research interests, and inquiry records. These data provide foundational knowledge for personalizing services, segmenting users for outreach, and designing needs-based programs for users. When analyzed over time, such data can also detect shifts in user preferences and draw attention to marginalized user groups, thereby enabling inclusive service planning.

Resources Usage and Access Data

These are data on how users interact with both physical and digital collections, such as circulation statistics, download counts, session durations, and page view counts from databases. Usage data are increasingly becoming more detailed and specific, which allow libraries to assess not only which resources are used but how, when, and by whom. Coupled with Altmetrics and citation tracking, these types of data are instrumental for justifying subscriptions, refining discovery tools (like OPAC, search bars on library website), and supporting digital contents management.

Metadata and Bibliographic Records

Structured metadata (such as title, author, subject headings, and identifiers) are not only used for cataloguing but also support resource discoverability in external platforms through standards like schema.org, BIBFRAME, and Dublin Core. In a linked-data environment, these metadata also improve library visibility across open web and AI-driven discovery platforms.

Spatial and Environmental Data

As libraries transition into hybrid learning environments, spatial data are becoming more important. Head counts, seat occupancy, and sensor-generated heat maps inform space redesigns and scheduling. Environmental monitoring (such as temperature, noise levels, and air quality) also affects how physical spaces are adapted for diverse users. Libraries, such as at North Carolina State University, have pioneered the use of Internet of Things devices to integrate real-time spatial data into user-facing services (Casden et al., 2020).

Operational and Acquisition Data

Data about users' information needs, budgets allocation, vendor information, and procurement history underpin internal efficiency. These help libraries conduct cost-benefit analyses, monitor vendor performance, and even assess staff allocation and competencies. Such data help ensure acquisitions are both cost-effective and responsive to user demands. This category of data also supports supply chain transparency and procurement audits.

Institutional Repository and Research Output Data

Academic libraries manage repositories that house theses, dissertations, research datasets, and other publications. Metrics on downloads, citations, and geographic reach help libraries demonstrate institutional research impact, support compliance with open access mandates, and inform collection development in emerging disciplines.

Staff and Workflow Data

Details about staff roles, qualifications, skill sets, and professional development activities are increasingly managed through integrated systems. These datasets support human resource planning, staff training needs analysis, and performance review. Workforce analytics are significant, especially in aligning staffing patterns with user demands and evolving service models.

Big Data vs. Small Data in Library

Big data in libraries typically emerge from digital information environment, such as online or database search histories, real-time logs, and system usage trails. These datasets are high in volume, velocity, and variety, and require advanced analytical tools and AI techniques for processing. They are suited to predictive modeling (e.g., demand forecasting, user segmentation) and service personalization efforts, such as enabling libraries to anticipate needs and tailor services accordingly (Kamupunga & Chunting, 2019; Shuaib et al., 2023).

In contrast, small data refer to context-specific, easily interpretable data like user surveys, individual borrowing patterns, or database access logs. These provide detailed information about specific user behaviours or information needs, and thus important for addressing localized problems and making tactical adjustments. While big data enable macro-level strategy, small data foster micro-level responsiveness, and together, they create a robust evidence base for planning.

Critically, the usefulness of library data lies not in their accumulation, but in their transformation into actionable intelligence. Data must be processed into meaningful information to guide planning and

improve services. Libraries that harness both big and small data can develop responsive strategies that meet user needs and support long-term goals (Kamupunga & Chunting, 2019). This requires a culture of inquiry, analytical skill sets, and the integration of insights into decision-making. Therefore, the next section elaborates on how these data types enable libraries to justify funding, optimize services, and remain adaptable in a rapidly evolving knowledge environment.

Importance of Data in Library Development

Data-driven decision-making is increasingly recognized as essential for enhancing the relevance, efficiency, and sustainability of library services. It ensures services are evidence based, adaptable, and aligned with user expectations. Libraries that utilize data are better positioned to deliver measurable value, improve service quality, and remain responsive to evolving user needs. Major reasons to justify the importance of data in library development include the following.

Driving Strategic Decision-Making

One of the primary uses of data in libraries is to guide strategic decision-making through evidence based approaches. Data help libraries identify and anticipate users' needs, allocate resources effectively, and design relevant services. Predictive and prescriptive analytics, derived from usage patterns and user feedback, support demand forecasting, priority-setting, and policy formulation. Bryant (2024) emphasized the significant role of data in guiding planning, evaluation and service enhancement. Data-informed strategies enable libraries to respond more effectively to current demands while also preparing to meet future challenges (Okonoko et al., 2018; Pierce, 2021; Press Reader Team, 2023).

Enhancing User-Centred Services

Understanding how users interact with resources enables libraries to tailor services to specific needs. Tracking borrowing patterns, digital access, and visit frequencies enables libraries to identify user needs and tailor services accordingly. This ensures a balanced and responsive collection aligned with current demand (Mannion, 2019; Vaughan, 2020).

Maximizing Resource Efficiency

Libraries often operate under financial and staffing constraints. Given such constraints, data help libraries allocate budgets, space, and staffing where they are most effective. Metrics on users' demands and collections usage guide acquisitions and technology investments, thereby maximizing limited resources (Gupta, 2025; Shuaib et al., 2023).

Shaping Responsive Collections

By identifying high-use materials and underutilized resources, libraries can build collections that reflect actual needs. Data support informed de-selection and identify collection gaps, aligning collections with user needs. This balance between users' demands and resource provision enhances user confidence and satisfaction (Bamigbola, 2023).

Showcasing Value and Securing Support

With growing competition for institutional funding, data are essential for showcasing the library's impact. Usage reports, impact evaluations, and satisfaction metrics demonstrate library relevance. These help justify funding, validate contributions to institutional goals, and communicate value to stakeholders (Frederick et al., 2020; LibLime, 2023).

Sustaining Quality Through Data

Libraries committed to continuous improvement depend on data to evaluate performance and implement necessary changes. Continuous evaluation using benchmarks and performance indicators allows libraries to refine services. Data-informed improvement processes ensure services remain relevant and of high quality (Sani & Oseji, 2022).

Staying Relevant to Changing User Needs

User expectations are rapidly evolving. Data on preferences and service use patterns help libraries remain agile, adapting to new trends and information behaviours (Agbonifoh & Osifo, 2017; Boiser, 2024). Services aligned with user needs are more likely to succeed.

Guiding Technology Investment

Monitoring how users engage with digital tools informs decisions on which platforms to adopt or improve. This ensures investments are aligned with user needs and yield positive returns in terms of access and satisfaction.

Strengthening Academic Impact

In academic libraries, data facilitate the evaluation of research services, teaching support, and scholarly communications. Libraries contribute to institutional performance by leveraging data to enhance academic outputs and collaboration.

Challenges in Library Data Utilization

Despite the transformative potential of data, many libraries face certain challenges in leveraging it effectively for service development and planning. Such challenges include the following.

Limited Data Literacy Among Library Staff

Many professionals in the field still lack the necessary competencies to analyze and apply data in practical contexts. This limits the adoption of evidence based practices and reduces the effectiveness of data collected for decision-making within the library.

Ethical and Privacy Concerns

Collecting user data for service enhancement must be carefully balanced with maintaining confidentiality and protecting user rights. Meanwhile, with the absence of robust data governance frameworks, ethical ambiguities may discourage meaningful data use.

Technological and Infrastructure Limitations

Effective data utilization relies on reliable systems and platforms, yet many libraries, especially in low-resource settings, lack access to modern technologies, stable internet connectivity, or the funding required for upgrades (Rawayau, 2023).

Institutional Resistance and Change Aversion

Shifting to data-driven approaches can cause resistance from staff accustomed to traditional methods. Fear of redundancy, low confidence with technology, as well as institutional apathy may all contribute to slow adoption.

Lack of Clear Data Governance Policies

Without well-defined institutional policies covering data ownership, access, privacy, and retention, libraries may be uncertain about legal responsibilities, user rights, or ethical boundaries, thereby operating in legal and procedural grey areas, which can further limit data-driven initiatives within such libraries.

Implications for Practice

Rather than simply calling for more resources, libraries can adopt realistic, context-sensitive strategies to gradually strengthen their data capabilities. The following implications focus on actions that can be pursued even amid systemic constraints.

Build Data Capacity Through Peer Learning

While formal training such as integrating data literacy into the core curriculum of library and information science is important, libraries can encourage peer mentoring whereby employees can share knowledge relating to data management. Internal expertise, even if limited, can be strategically leveraged to support incremental improvements.

Adopt Low-Cost, Scalable Data Tools

Instead of waiting for major infrastructure investments, libraries can adopt open source or low-cost data tools, such as Google Forms for surveys, Excel for basic analytics, or KOHA for integrated library systems. These enable libraries to begin using data meaningfully without large upfront costs.

Establish Practical Data Governance Guidelines

Even in the absence of formal national regulations, libraries can develop simple internal protocols for data handling, such as anonymizing user data, obtaining informed consent, as well as setting clear data access levels. Such guidelines support ethical practices without requiring complex infrastructure.

Promote a Culture of Inquiry Over Compliance

Embedding data into library work does not require all staff to become analysts. Rather, library managers can model curiosity and evidence based questioning in everyday operations, e.g., “What do the data

suggest about how users interact with this service?” This will enable them to shift culture gradually.

Pilot User-Centred Service Improvements

Rather than overhauling entire services, libraries can initiate small, data-informed changes, such as adjusting opening hours based on usage data, or creating targeted guides for frequently searched topics, and assess their effectiveness before scaling up.

Strengthen Partnerships for Data Support

Libraries can collaborate with university information and communication technology units, data science departments, or external data experts to support data-related projects. For example, final-year information technology students may assist the library with data visualization tools as part of their project works.

Focus on Advocacy Through Impact Narratives

Instead of just reporting numbers, libraries can combine data with stories of impacts to strengthen advocacy. For instance, showing how increased database usage supported postgraduate research completion can be more persuasive to funders than raw statistics alone.

Incremental Integration of Data Into Strategic Planning

Libraries can begin integrating basic data points, such as most-requested resources or attendance at training sessions, into monthly reports or annual reviews. This fosters familiarity with data use and supports more strategic decision-making over time.

Case-Based Applications of Data in Library Practice

To demonstrate the transformative potential of data in library development, it is useful to examine specific examples where libraries have applied data strategically. These cases illustrate a range of data methods, like descriptive, diagnostic, predictive, and prescriptive analytics, and equally show how data use can directly inform service improvements, planning, and advocacy.

University of Huddersfield, UK

The Library Impact Data Project at Huddersfield used descriptive and diagnostic analytics to examine activity data such as book loans, e-resource usage, and gate entries across over 33,000 students in eight UK universities (Stone & Ramsden, 2013). By correlating these indicators with academic performance, the researchers uncovered a statistically significant relationship between high library usage and better degree outcomes. These findings were not only published but actively used to strengthen funding applications and inform library outreach strategies. This case demonstrates the advocacy power of data when tied to academic success.

North Carolina State University Libraries, USA

At North Carolina State, a combination of Internet of Things occupancy sensors and the open-source Suma toolkit provided real-time, location-based usage data of library spaces. These descriptive and

prescriptive data allowed staff to optimize space use, redesign study areas based on crowding patterns, as well as introducing “How busy is the library?” dashboards to help students avoid congestion (Casden et al., 2020). The initiative resulted in better user experience and more efficient space allocation. This indicates how real-time data can drive responsive service delivery.

Nyong Essien Library, University of Uyo, Nigeria

Using descriptive analytics of library usage data from 2018–2020, the Nyong Essien Library identified poor engagement with both print and electronic resources (Aloysius et al., 2022). This analysis served as a baseline for evaluating service relevance and pinpointing areas requiring outreach and promotional interventions. Although the findings highlighted challenges, they provided actionable insights that could inform redesign of user education or access strategies.

Demand-Driven E-book Acquisition Models

Across several academic libraries, predictive analytics have been used to refine demand-driven acquisition models (Jiang et al., 2019). Libraries employed survival and time-to-trigger models to predict which e-books were likely to be accessed and when, allowing them to prioritize purchases. The model indicates a shift from reactive to proactive resource acquisition, where data anticipate rather than merely record need.

Conclusion

The role of data in modern library development can no longer be regarded as supplementary. It is now foundational to effective service delivery, strategic planning, decision-making, and institutional relevance. As this paper has shown, data have become indispensable to the development of libraries, enabling them to make informed decisions, understand user needs, allocate resources efficiently, and demonstrate value to stakeholders. These functions are particularly critical in resource-constrained environments, where libraries must continually justify their contributions and compete for limited funding.

However, the effective utilization of data is not without its challenges. Issues such as inadequate data literacy among staff, infrastructural and technological limitations, inconsistent institutional support, and ethical concerns must be addressed for data-driven practices to thrive. Strengthening staff capacity through ongoing training, integrating data literacy into library and information science curricula, and fostering a supportive institutional culture are critical steps. The integration of data-driven practices is not merely a technical upgrade; it signals a cultural shift towards accountability, responsiveness, evidence informed planning, and continuous improvement in library service delivery. Libraries that adopt and sustain this approach will be better positioned to remain relevant, resilient, and impactful in a rapidly evolving information environment.

Author Contributions

Blessing Babawale Amusan: Conceptualization, Writing - original draft, review & editing
Adeyinka Tella: Writing - review & editing

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