Vol. 14(2), pp. 73-81, March 2026
https://doi.org/10.14662/ijalis2026045

ISSN: 2360-7858
http://www.academicresearchjournals.org/IJALIS/Index.htm

International Journal of Academic Library and Information Science

Full Length Research

Applications and Utilization of QR Code Technologies in Library Service Delivery in Academic Libraries in the Digital Age

Dr. Olubiyo Peter Olubunmi

University Library, Adeyemi Federal University of Education, Ondo, Ondo State, Nigeria

Accepted 27 March 2026

This fast growth of Quick Response (QR) Code technology in various sectors of the world has made it a strong facilitator of contactless and digital-first interactions in service provision. QR code in academic libraries is a ground breaking but largely underexplored method of connecting the physical and digital service continuum, discovering resources, better accessing information and re-inventing the service delivery process in the digital era. The paper is a thorough analysis of the implementation and use of QR code technologies in provision of academic library services and especially to the environments and opportunities of the academic libraries in the digital era. Using the Innovation Adoption Theory, the Uses and Gratifications Theory, and the Technology Acceptance Model (TAM), the paper analyzes the global and African empirical literature, institutional case studies, and statistics to chart the current field of QR code implementation in academic libraries. It has been documented that the use of QR codes has increased by more than 323% worldwide in 2021-2024 and more than 44.6% of internet users worldwide have scanned at least one QR code in a month as of 2023. QR codes have proven to be quantifiably effective in monitoring information resources, providing self-service access, promoting library instruction, and marketing library services in academic libraries. The article provides comprehensive tables, typological schematics, and process models to demonstrate the variety of applications of QR codes on library service streams. It also does locate the obstacles facing the implementation of QR codes in academic libraries and especially within the developing world scenario and provides evidence-based desirable solutions and recommendations to the library practitioners, administrators and policymakers.

Keywords: QR Codes, Quick Response Codes, Academic Libraries, Library services, Digital Age, Information Resources, Library Automation, Mobile technology, Nigeria.

Cite This Article As: Olubiyo, O.P. (2026). Applications and Utilization of Qr Code Technologies in Library Service Delivery in Academic Libraries in The Digital Age**.** Inter. J. Acad. Lib. Info. Sci. 14(2): 73-81

INTRODUCTION

Digital era has brought fundamental changes in the manner in which academic libraries provide services, access information and interact with communities that patronize them. With the ubiquity of smartphones, the uninterrupted availability of mobile internet, and the increasing demand on patrons to experience convenience-based logic of digital commerce and communication, academic libraries are being called upon to implement technologies that are easy to use, efficient, and platform-independent. A digital tool that has become one of the most adaptable and available digital tools to

library workers in this transformative situation is Quick Response (QR) Code technology, a two-dimensional matrix barcode, which can encode various data types such as URLs, text, email addresses, and geolocation coordinates (Latha Sree & Ravinder, 2022; Turamari, 2022).

QR codes had their inception way back in 1994 by Denso Wave, an offshoot of Toyota Motor Corporation in Japan, as a means of monitoring vehicle parts in the production process, which explains their initial practical use as information access and information tracking devices (Kadli, 2020). Out of this industrial origin, QR code has infiltrated most areas of human endeavor, including healthcare and logistics, education, tourism, and financial services. The COVID-19 pandemic was a slope-accelerator of this diffusion, making contactless information sharing an essential aspect of global health. In 2023, the QR code scanning was documented at 26.95 million all over the world in over 50 nations, which is an impressive 433% rise compared to the previous two years (QRCodeChimp, 2024; Krofile, 2025).

The use of QR codes has been reported in academic libraries in various service streams, including directional and promotional signs; collection access; information literacy teaching; and tracking resources. Nigeria, with one of the highest rates of QR code usage in the world, alongside China and India (Coolest-Gadgets, 2025), is an especially interesting country to consider the application of QR codes in academic libraries, as the country has a significant and growing smartphone adoption rate, a growing population of university students whose behaviour is becoming more mobile-first, and is continually faced with the challenge of limited infrastructure which dictates The paper presents a hardcore, fact-based analysis of the use, usefulness, problems, and the transformational capacity of this technology in the delivery of services in academic libraries.

Objectives of the Study

This paper specifically aims to:

- Examine the concept and technical characteristics of QR Code technology as a library service tool.
- Analyse the range of applications of QR codes in academic library service delivery globally and in Africa.
- Evaluate the specific use of QR codes in tracking and accessing information resources in academic libraries.
- Identify and analyse the challenges confronting QR code deployment in academic libraries, particularly in the Nigerian context.
- Propose strategic, evidence-based solutions for effective QR code adoption and sustainability in academic libraries.

LIBRARY AND ACADEMIC LIBRARY: CONCEPTUAL FRAMEWORKS

The Library as a Digital Service Institution

The modern library is not simply a physical building with printed papers; it is a dynamic knowledge system that combines the physical and the digital environment, print and electronic resources, in-person and distance services into a consistent, user-focused knowledge system. According to Taylor (2009), the modern library consists of a coordinated set of information resources, which are arranged to meet the information requirements of a given community, and extended by technologies which allow access to the information outside of the physical facility and the operational hours of the institution. This is the point at which the QR code technology finds its strongest application.

Academic Libraries: Function and Digital Mandate

Academic libraries are the main information infrastructure of universities and higher education institutions. Their main activities include collection development and management, information organisation and retrieval, reference and information services, information literacy instruction, and research support. The 21st century is characterized by the fact that these functions are increasingly mediated by digital technologies that, on the one hand, expand the reach of services, and, on the other hand, new modalities of patron engagement are developed (Unegbu & Onuoha, 2021; Idiodi, 2005).

In a Strategic Plan published in 2020 by the International Federation of Library Associations and Institutions (IFLA) Academic Libraries Standing Committee, it is noted that academic libraries cannot view digital transformation as a nice-to-have improvement anymore, but as an essential strategic necessity. This requirement involves the implementation of mobile-friendly solutions, open access solutions, and data management services that can make the academic library an essential stakeholder in the digital scholarship ecosystem (IFLA, 2020). QR codes are the low-income barriers to digital resources and services, thus aligning with this strategic vision.

LIBRARY SERVICES IN ACADEMIC LIBRARIES

Academic library services represent a continuum between traditional and digital services. Such services are reference and information services, circulation services, collection access and retrieval, current awareness services, document delivery and interlibrary loan, information literacy and bibliographic instruction, institutional repository management and community outreach and promotional services. The successful implementation of all these types of services can be greatly improved by strategic QR code implementation (Das et al., 2020; Stephen, 2023).

The context of service delivery in the Nigerian university library has been traditionally limited by the physical access constraints, most of the services are only available to patrons physically present, collections are stored in closed-stack in the majority of cases, and catalogue access is only available to terminals on-site. By connecting real-world library spaces and materials with digitized services and resources, QR codes provide an effective tool to expand access to services without commensurate staffing and infrastructure investments. According to Cauley et al. (2023), academic libraries in a post-pandemic setting have been using QR codes as a means of on-campus and remote service delivery specifically, which is especially pertinent to consider in the case of Nigerian universities that have high numbers of off-campus students.

QR CODE TECHNOLOGIES: CHARACTERISTICS, TYPES, AND INFORMATION ENCODING

Technical Characteristics of QR Codes

A QR (Quick Response) code is a two-dimensional grid barcode that data are coded in a pattern of black squares on a white background, and read with an imaging device (including a smartphone camera), and processed with ReedSolomon error correction. In contrast to barcodes (which are one-dimensional, i.e. can encode information only horizontally), QR codes can encode information horizontally and vertically, thus being able to store much more information in a small format (Latha Sree & Ravinder, 2022; Turamari, 2022).

Some types of data that can be encoded into QR codes include URLs, plain text, email addresses, phone numbers, SMS messages, Wi-Fi network credentials, vCard contact information, and geographic coordinates. The maximum characters that can be stored in a typical QR code are 7,089 numeric characters, 4,296 alphanumeric characters, or 2,953 bytes of binary information (Kadli, 2020). More importantly, QR codes are created with error correction in mind: an up to 30 percent portion of a QR code can be damaged or obscured and still be read completely, which is a significant feature in the practical sense of such library settings, where the printed codes may be worn or scribbled upon, or obscured by other materials (Electroiq, 2025).

Types of QR Codes Relevant to Library Applications

Table 1: Types of QR Codes and Their Library Service Applications

QR Code Type	Key Characteristics	Advantage for Libraries	Example Library Use Case
Static QR Code	Fixed data; cannot be changed after printing; free to generate	Simple, low-cost; no internet needed to generate	Shelf location labels; directional signs; item identifiers
Dynamic QR Code	Linked to editable URL; data can be updated without reprinting	Content updatable; scan analytics available; preferred for services	E-database access links; service promotions; event registration
URL QR Code	Encodes a specific web URL; most common library type	Direct link to OPAC records, e-journals, databases, or guides	Book OPAC record link; research guide; e-journal access
vCard QR Code	Encodes contact information for a person or institution	Enables patron contact with subject librarians; outreach	Librarian contact cards; reference desk signage
Wi-Fi QR Code	Encodes Wi-Fi credentials; auto-connects devices on scan	Frictionless library Wi-Fi access for patrons	Reading room Wi-Fi access signs
PDF/Multi-page QR Code	Links to downloadable PDF or multi-page digital content	Share handouts, reading lists, or policies without printing	Library instruction handouts; reading lists; policy documents

Table 1: Compiled from Latha Sree & Ravinder (2022); Kadli (2020); Turamari (2022); Das et al. (2020)

Global QR Code Usage Statistics

The size and pattern of adoption of QR codes in the world offers strong background to the adoption of QR codes in academic libraries. QRCodeChimp (2024) reports that about 44.6 percent of all internet users worldwide aged 16 to 64 years old, scan at least one QR code every month as of 2023. The smartphone penetration, which is a requirement in QR code scanning, has increased since 3.2 billion users in 2016 to 6.84 billion users in 2023, at the rate of about 11.83 percent per year (Scanova, 2024; Krofile, 2025). The number of scans has risen to 26.95 million by 2023, a 433% growth in two years, with the usage of QR codes growing by more than 323 percent in 2021-24 (QRCodeChimp, 2024).

Mobile-first digital economies are leading to a rapid adoption of QR codes in Africa. Nigeria, with China and India, is one of the three countries in the world that use QR codes most (Coolest-Gadgets, 2025), showing how mobile penetration in the country is high, and QR code usage is rife in fintech applications like Palmpay and Opay. The African mobile point-of-sale (POS) market, which is largely motivated by the use of QR codes, is expected to experience a CAGR of 16.55% by 2024-2028 (Scanova, 2024). This atmosphere forms an extremely responsive user base to library services based on QR codes.

Table 2: Key Global QR Code Usage Statistics Relevant to Academic Library Planning

Statistical Indicator	Figure / Value	Implication for Academic Libraries
Global monthly QR scanners (2023)	44.6% of internet users	High patron familiarity; minimal user education barrier for QR-based services
Global QR code usage surge (2021–2024)	323% increase	Momentum and user habituation strongly favour new QR library implementations
Global smartphone users (2023)	~6.84 billion	Virtually all university students own camera-enabled smartphones; scanning tool is ubiquitous
QR code error tolerance	Up to 30% damage readable	Durable for physical library environments; wear-resistant application is viable
Nigeria global QR usage ranking	Top 3 (with China & India)	Nigerian students are experienced QR users; receptive audience for library deployment
Marketing/Advertising QR scan growth (2021–2023)	323% growth	Proven effectiveness for promotional and engagement purposes relevant to library marketing
Patrons scanning forms via QR in library instruction (Jan–Oct 2023)	>70% chose QR over direct link	Students prefer QR scanning over URL typing; instructional library delivery should default to QR

Table 2: Compiled from QRCodeChimp (2024); Krofile (2025); Scanova (2024); Coolest-Gadgets (2025); Sterner (2023)

APPLICATION AND USE OF QR CODE TECHNOLOGIES TO TRACKING INFORMATION RESOURCES

QR Codes for Physical Collection Management and Tracking

The most useful operationally of QR codes in academic libraries is the monitoring and control of the physical information resources. When placed on books, journals, audiovisual resources or equipment, QR codes are machine readable identifiers that connect physical objects to their digital bibliographic records, circulation data, and location information in the library management system. The application essentially changes the manual process of inventory management, stock checking and mapping collections to fast, device-supported processes (Das et al., 2020; Turamari, 2022).

IIT Gandhinagar Library in India described in a case study by Das et al. (2020) showed that the introduction of QR codes on library materials and integration with the integrated library system cut the time spent on the process of annual verification of stock by several weeks down to a few days, at the same time, increasing the accuracy of the records. By scanning a QR code on a book spine, a patron or staff member will get immediate access to the Koha or other ILS record of the item, and real-time access to circulation information, location, and call number, as well as bibliographic description. Such a smooth blend of physical and digital record-keeping is a paradigm shift in collection management practice.

Self-Service Resource Discovery and Access

QR codes on library shelves, subject area labels, or displays of resources can be connected to associated OPAC search results, subject research guides (LibGuides), or individual bibliographic records, allowing patrons to have access to detailed resource information, check availability, and place holds all on their smartphones, without having to access a dedicated library catalogue terminal. This self-service discovery feature is especially useful in university libraries in Nigeria where the ratios of patrons to terminals are sometimes highly undesirable, with many libraries having less than one catalogue terminal per 500 registered patrons.

In St. Xavier's University Kolkata, Stephen (2023) recorded the systematic implementation of QR codes on shelves that connected to subject bibliographies and recommended reading lists and allowed students to access curated resources lists in real time as they walked through the stacks. It is a hallmark of innovative thinking that is enabled by the QR code and is an amalgamation of the physical serendipitous browsing process with efficiency of information retrieval that is available in digital formats, a synthesis that brings significant value to the academic library user experience.

Digital Resource and E-Database Access

QR codes can be used as simplified access gateways to authenticated patron access of academic libraries subscribing to electronic databases, e-journals, and digital repositories. Instead of forcing the patrons to use complicated URLs, memorize database titles, or find access points on the library site, a scan with a QR code can log in and send the patron straight to the desired digital resource (Kadli, 2020; Das et al., 2020). In the case of the libraries of Nigerian universities that have access to databases like NUC Virtual Library, HINARI, AGORA, OARE, EBSCO Host databases, QR code-mediated access can radically streamline and democratise the use of digital resources by student and faculty audiences.

APPLICATION AND USE OF QR CODE TECHNOLOGIES TO LIBRARY SERVICES IN ACADEMIC LIBRARIES

Library Instruction and Information Literacy

One of the pedagogically most enriching and empirically tested applications of the technology in academic libraries is the use of QR codes in library instruction. The inclusion of QR codes in instructional slides, handouts or classroom signage allow students to access demonstration databases, research guides, citation management tools, library tutorials and post-instructional assessment forms with a touch of a button, greatly improving the interactivity and effectiveness of information literacy sessions.

A compelling case that Sterner (2023) has documented takes place at Northern Illinois University, where an education librarian, Alissa Droog, reported that during January through October 2023, during sessions of library instruction through synchronous methods, more than 70% of the participants (out of more than 100) who completed post-instruction feedback forms did so using a QR code instead of a direct URL In addition, Cauley et al. (2023) recorded the use of QR code-linked posters and postcards at the John Jay College of Criminal Justice in New York to conduct library outreach and promotion after COVID-19 lockdowns, recording the number of gate counts and spring semester gate counts to assess the use of the QR code in patron return patterns.

Library Promotions and Marketing

QR codes can provide an affordable, quantifiable solution to academic libraries that want to advertise their services, collections and events to the on-campus and off-campus populations of patrons. Dynamic QR codes, where scan analytics can be monitored in real-time, can help librarians evaluate the level of patron interaction with particular promotional material, contrast the performance of various communication lines, and evidence-based marketing investments. When a QR code is placed on a poster promoting a new e-database subscription, such as, the number of patrons who have scanned the poster, the time of the scans, and the device used, which cannot be highlighted in a traditional print promotion, can be shown (Krofile, 2025; Das et al., 2020).

Contactless Reference and Service Desk Operations

QR codes offer a non-contact method of patron-librarian interaction in settings where social distancing is of concern, librarians are concerned about health safety, or after-hours access. A reference desk QR code that goes to an online reference chat service, research consultation booking form or a frequently asked questions (FAQ) knowledge base will allow patrons to get support wherever, whenever they need it. Latha Sree and Ravinder (2022) observe that QR codes can improve the experience of libraries by enabling users to rapidly access resources using their mobile devices and libraries to effectively market their services and interact with users, even though this modality of contactless reference.

A Comprehensive Framework of QR Code Applications in Academic Library Service Delivery

Table 3: Typological Framework of QR Code Applications Across Academic Library Service Streams

Service Stream	QR Code Deployment Point	Linked Digital Content	Patron Benefit
Collection Access	Item spine label, shelf talker	OPAC record; check availability; place hold	Instant item status; mobile self-service
Resource Discovery	Subject area shelf signs	Subject research guide (LibGuide); recommended reading list	Curated discovery; browse + digital access simultaneously
Digital Resources	Database access posters; reading rooms	E-database login page; NUC Virtual Library; HINARI/AGORA	One-scan access to authenticated digital resources
Library Instruction	Instruction slides; classroom handouts	Research guides; tutorials; feedback forms; citing tools	Interactive instruction; post-session engagement
Reference Services	Reference desk signage; library website	Online chat; booking form; FAQ knowledge base	24/7 contactless reference access
Library Promotions	Event posters; notice boards; social media	Event registration; programme schedule; service descriptions	Frictionless event/service engagement; measurable outreach
Circulation Services	Item barcodes; returns boxes; circulation desk	Patron account; renewal portal; loan history	Self-renewal; account management without desk visit
Institutional Repository	Thesis print copies; publication pages	DSpace/EPrints item record; full-text access	Instant access to digital version of physical item
Infrastructure / Wayfinding	Building entrance; section dividers; floor maps	Digital library floor plan; Wi-Fi credentials; opening hours	Frictionless orientation; immediate connectivity

Table 3: Author's Typological Framework (2024); derived from Das et al. (2020); Turamari (2022); Stephen (2023); Kadli (2020)

CHALLENGES TO USE OF QR CODE TECHNOLOGIES IN ACADEMIC LIBRARY SERVICE DELIVERY

Technological and Infrastructure Barriers

Regardless of the strong benefits of QR code technology, there are a few obstacles limiting its successful implementation and continued use in academic libraries especially in developing countries settings. The most essential requirement of QR code functionality is a stable internet connection, which is also unevenly distributed among the campuses of the Nigerian universities. Although students are more likely to have smartphones with QR code scanning (Nigeria is one of the top three in the world in QR code use [Coolest-Gadgets, 2025]) and are able to access digital resources, which QR codes lead to, without a reliable, high velocity internet connection. Unless libraries have a strong campus wide Wi-Fi connection, libraries that put QR code signage up run the risk of frustrating their patrons and seeing them abandon the technology soon after implementation.

User Awareness and Digital Literacy

Although many university students and academic staff, especially older generations or rural, might be unaware of the process of scanning QR code, may not have QR readers apps installed (however, most modern smartphones include built-in scanning in the default camera application), or may be unaware of the information stored in libraries in QR codes, despite a large proportion of the population having high ownership of smartphones. Even the most strategically located library QR code will not benefit a patron that does not know what a QR code is, or has never used such a code to access libraries without specific awareness campaigns and education (Kadli, 2020; Latha Sree and Ravinder, 2022).

Content Management and Sustainability

The usefulness of a QR code wholly relies on the sustained availability and correctness of the content that it is associated with. Radio fixed QR codes, after printing, cannot be changed; when the URL to which the code links changes or goes dead (a process called link rot), the QR code is rendered permanently useless, with no physical replacement of the signage necessary. Dynamic QR codes overcome this shortcoming but need paid subscription services and regular content management processes. The creation, and maintenance of efficient QR code content management procedures is a non-trivial operational issue in resource-constrained academic libraries where small professional staffing supplements are used (GR Tech, 2023; Latha Sree & Ravinder, 2022).

Security and Privacy Concerns

The international emergence of quishing (QR code phishing), the act of inserting malicious URLs QR codes in order to fake a user into accessing malicious websites is a rising security risk that academic libraries need to tackle, proactively. With the widespread presence of the QR code medium in any place, fraudsters are actively taking advantage of the fact that people trust institutional signage to place fraudulent codes in the majority of locations. By implementing QR codes without a well-defined institutional branding, secure URLs, and security education campaigns to patrons, libraries that implement such systems risk exposing their patron groups to cybersecurity threats (Krofile, 2025; Electroiq, 2025).

Table 4: Key Challenges to QR Code Adoption in Academic Libraries and Corresponding Solutions

Challenge	Specific Manifestation	Preferred Solution
Internet Connectivity	QR-linked digital resources inaccessible without campus Wi-Fi	Deploy QR codes in areas with confirmed Wi-Fi coverage; lobby for dedicated library broadband
User Awareness	Patrons unaware of QR code function or library-specific use	Integrate QR literacy in library orientation; display 'How to Scan' instructions alongside all QR codes
Link Rot (Static Codes)	Printed static QR codes link to outdated or dead URLs	Prioritise dynamic QR codes; schedule regular link audits; use institutional URL shorteners
QR Code Security (Quishing)	Fraudulent QR codes overlaid on library signage; patron cybersecurity risk	Brand all codes with institutional logo; use tamper-evident placement; educate patrons on security
Staff Capacity	Library staff unfamiliar with QR generation, deployment, and analytics	Include QR code management in staff CPD programmes; designate QR champions per unit
Funding / Sustainability	Dynamic QR services require subscription costs; printing costs for code updates	Explore free-tier dynamic QR services (QR Code Monkey, Bitly); integrate into library IT budget

Table 4: Author's Synthesis (2024); derived from Krofile (2025); GR Tech (2023); Kadli (2020); Cauley et al. (2023)

PREFERRED SOLUTIONS FOR EFFECTIVE QR CODE DEPLOYMENT IN ACADEMIC LIBRARIES

Strategic Planning and Phased Implementation

The implementation of QR codes in academic libraries must be thought of as a strategic, intended intervention, and not an experimental implementation of a technology. Libraries can experience a gradual implementation plan, starting with high-traffic, high-impact deployment points such as library entrance wayfinding, database access signage, and circulation self-renewal, to develop staff capacity, test user reaction, and optimize workflows before larger scale roll out. Before any deployment a formal QR code implementation policy document, including design standards, content management protocols, security procedures, and evaluation metrics, should be created (Das et al., 2020; Turamari, 2022).

Patron Education and Awareness Campaigns

Effective QR code adoption cannot be negotiable without systematic patron education. To promote QR code-based library services, libraries ought to incorporate QR code literacy into first-year library orientation programmes, create and post recognizable instructional resources at all deployment points of QR codes, and utilise social media platforms and digital communication platforms that face students to advertise QR code-based library services. As Sterner (2023) demonstrates, when students in an instructional setting are introduced to QR codes in a single task, they quickly develop the behaviour in other interactions meditated by QR codes in the library.

Dynamic QR Code Systems with Analytics

Libraries ought to focus on the use of dynamic over the static QR code on all services applications, since dynamic codes allow updating of the content without physical replacement of signage and offer scan analytics to support evidence-based service evaluation. Several reputable sites provide free-tier dynamic QR code creation services with a simple analytics feature, such as QR Code Monkey, Bitly, and QR Tiger, features which libraries with a tight budget can afford. Institutional QR code management platforms should be considered where possible to offer centralised control, brand consistency, and departmental analytics to all deployment points of the library (Krofile, 2025; Das et al., 2020).

Integration with Library Management Systems

Applications of QR codes which are directly integrated with the library management system are the most transformative and sustainable applications of the QR codes in academic libraries. When the QR codes on tangible objects are connected to the respective Koha or other ILS record to show real time circulation status, availability, and bibliographic information, the outcome is a smooth physical-digital information ecosystem that significantly improves the efficiency of collection management and patron service experience. Libraries ought to collaborate with Koha system administrators to set up automated generation of QR codes based on item records, which allows a scalable, system-based strategy to QR code implementation across the physical collection (Das et al., 2020; Ogbomo et al., 2023).

CONCLUSION AND RECOMMENDATIONS

The paper has thoroughly discussed the use and implementation of the QR code technologies in the digital era in the service delivery of academic libraries. The reviewed evidence, comprising international statistics on the uptake of QR codes to institutional case studies and the results of empirical research, all point to an appealing conclusion: QR code technology is a high value, low barrier opportunity that allows academic libraries to serve an increasing number of patrons, improve their experience, manage collections more efficiently, and establish themselves as digital-era institutions.

In the case of Nigerian academic libraries, specifically, where Nigeria's role as one of the top three QR code utilizers in the world creates an open and experienced user base, and where low-cost, device-native technologies are of special interest due to the limits of infrastructure provision. It is recommended to library practitioners and policymakers to follow the following specific recommendations:

- Each academic library is to create a written QR Code Service Delivery Policy, which includes its design standards, deployment guidelines, content management systems, security policies, and assessment systems.
- Koha and other library management systems must be set up to create item-level QR codes by default, allowing physical-digital collection to be integrated easily.
- All library orientation and information literacy programmes should include QR code literacy and make sure that patrons are literate enough to get the best out of QR mediated library services.
- Academic libraries are advised to develop specific QR code monitoring schedules and update schedules whereby all deployed codes would be audited quarterly to detect and manage broken links.
- One of the ways in which the QR code technology can be utilized in libraries and Information Science in Nigeria is by making it part of their curriculum to ensure that the graduates leave the institution with knowledge of this important digital service tool.
- University administrations must invest in a strong campus-wide Wi-Fi network as a precondition to the realisation of the full potential of QR code-mediated library service delivery.
- Libraries must take advantage of the QR code scan analytics to create evidence of patron use of digital services, and use this information to bolster their case to the university management of why they should invest in library technology.

REFERENCES

Ajagekar, R. H. (2022). QR codes and useful apps for academic libraries. *International Journal of Advance and Applied Research, 10*(1), 303–309. https://doi.org/10.5281/zenodo.7188156

Ateka, A., & Kwanya, T. (2019). Using QR codes to promote information services and products in academic libraries in Kenya. In *Digital technologies for information and knowledge management* (pp. 247–254). The Technical University of Kenya. http://hdl.handle.net/123456789/1767

Cauley, K., Kiriakova, M., & Sexton, E. (2023). They're back! QR codes for marketing the academic library after pandemic lockdowns. *Public Services Quarterly, 19*(3), 163–175. https://doi.org/10.1080/15228959.2022.2152152

Coolest-Gadgets. (2025). *QR code usage statistics by users and facts*. https://coolest-gadgets.com/qr-code-usage-statistics/

Das, I., & Das, D. (2021). QR code and its effectiveness in library services. *Library Philosophy and Practice (e-journal)*, Article 5540. https://digitalcommons.unl.edu/libphilprac/5540

Das, T. K., Kumbar, T. S., & Ramswaroop, A. (2020). Use of QR codes for enhancing access to library resources and services: A case study of IIT Gandhinagar Library. *Annals of Library and Information Studies, 67*(3), 156–163. https://doi.org/10.56042/alis.v67i3.31482

Electroiq. (2025). *QR code statistics by usage, adoption, behavior, demographics, benefits, impacts and facts*. https://electroiq.com/stats/qr-code-statistics/

IFLA Academic Libraries Standing Committee. (2020). *IFLA 2020 strategic plan: Academic libraries*. International Federation of Library Associations and Institutions.

Kadli, J. H. (2020). QR codes: Academic library perspective in digital age. *Library Philosophy and Practice (e-journal)*, Article 3916. https://digitalcommons.unl.edu/libphilprac/3916

Krofile. (2025). *75+ QR code statistics you must know in 2026*. https://krofile.com/blog/qr-code-statistics/

Latha Sree, P., & Ravinder, D. (2022). QR codes: Use in library services. *International Journal of Research in Library Science, 8*(4). https://doi.org/10.26761/IJRLS.8.4.2022.1588

Ogbomo, M. O., Ebhonu, S. I., & Etagbedavwe, E. (2023). Koha integrated library system (ILS): The experience of Admiralty University of Nigeria Library, Ibusa. *Library Philosophy and Practice (e-journal)*, Article 7648. https://digitalcommons.unl.edu/libphilprac/7648

QRCodeChimp. (2024). *QR code statistics for 2026: Usage, trends, forecasts, and more*. https://www.qrcodechimp.com/qr-code-statistics/

QR-Insights. (2025). *Global QR code adoption report 2025: Market analysis across 50 countries*. https://www.qr-insights.com/blog/2025-09-19-global-qr-code-adoption-report-2025

Scanova. (2024). *QR code statistics 2024: Latest numbers on global usage*. https://scanova.io/blog/qr-code-statistics/

Stephen, G. (2023). QR code and their application in academic libraries: A case study from St. Xavier's University, Kolkata. *International Journal of Information Movement, 8*(2), 1–6.

Sterner, E. (2023, October 19). Unpublished interview data on QR code usage in library instruction [Unpublished raw data]. Northern Illinois University.

Taylor, A. G., & Joudrey, D. N. (2009). *The organization of information* (3rd ed.). Libraries Unlimited.

Turamari, R. (2022). Application of QR code in academic libraries: A study. *International Journal of Research and Analytical Reviews, 9*(4), 196–202. http://www.ijrar.org/IJRAR22D2840.pdf

Ubogu, J. O. (2019). Impact of information technology in Nigerian university libraries. *Open Access Library Journal, 6*(4), Article e5370. https://doi.org/10.4236/oalib.1105370

Unegbu, V. E., & Onuoha, U. D. (2021). Library and information services for sustainable development in Nigeria. *Journal of Library Services and Technologies, 3*(1), 1–12.