



Enhancing Academic Resource Access Via QR Code Wall Library: An ADDIE Approach in a Hadith Research Laboratory

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ABSTRACT

The Hadith Research Laboratory at the Faculty of Quranic and Sunnah Studies (FPQS), Universiti Sains Islam Malaysia (USIM) provides physical access to primary Hadith literature to support hands-on learning. However, challenges such as limited physical space, missing or damaged book volumes, high acquisition costs, and the absence of dedicated library personnel impede seamless academic access. To enhance resource availability without heavy infrastructure investments, this study developed and evaluated a physical-digital hybrid "QR Code Wall Library" using the ADDIE (Analysis, Design, Development, Implementation, Evaluation) instructional model. Needs analysis involving subject matter experts identified key Hadith texts, which were integrated with shortened digital URLs and custom QR codes. A total of 53 student researchers participated in the usability evaluation. Findings indicated that 54.7% of respondents preferred digital reference methods over manual physical browsing (45.3%). Overall user satisfaction reached 73.1%. The usability metrics confirmed that the QR Code Wall Library was perceived to substantially enhance access efficiency (81.1% reported increased productivity), interaction effectiveness (75.4%), and ease of use (77.4%). This study demonstrates that combining physical wall displays with QR code technology effectively bridges classical Islamic text repositories with modern mobile learning, serving as a scalable solution for academic resource centers.

Keywords: Academic Resource Access, QR Code Wall Library, ADDIE Model, Hadith Research Laboratory, Mobile Learning, Usability Evaluation.

INTRODUCTION

Academic libraries in higher learning institutions serve as critical knowledge hubs supporting teaching, learning, and research. In specialized disciplines such as Islamic Studies, access to primary Hadith literature, often spanning multi-volume encyclopedic collections, is essential for source verification (*Takhrīj*) and biographical evaluation (*‘Ilm al-Rijāl*). The Faculty of Quranic and Sunnah Studies (FPQS) at Universiti Sains Islam Malaysia (USIM) established a dedicated Hadith Laboratory to integrate physical reference books with digital tools such as *Al-Maktabah al-Shāmilah* and *Jawāmi ‘al-Kalim*.

Despite its strategic importance, the physical Hadith Research Laboratory faces severe operational constraints:

- **Limited Physical Capacity:** The lab space cannot accommodate large student cohorts simultaneously during peak research sessions.

- **Resource Incompleteness:** High procurement costs, combined with damaged, lost, or unreturned volumes, leave key Hadith series incomplete.
- **Restricted Access:** Physical volumes cannot be checked out of the laboratory, limiting research activities outside operating hours.

To address these challenges, mobile technologies such as Quick Response (QR) codes offer a frictionless, low-cost solution. QR codes can store uniform resource locators (URLs) linking directly to high-resolution digital facsimiles of classical Hadith manuscripts hosted on public waqf repositories (e.g., Waqfeya.com).

While previous research has explored QR codes in general university library orientation and marketing (Hussain, 2023), limited scholarly work exists on utilizing QR code "Wall Libraries" within specialized Islamic research laboratories. This study addresses this gap by developing and evaluating a QR Code Wall Library for the FPQS Hadith Research Laboratory using the ADDIE instructional framework.

LITERATURE REVIEW & THEORETICAL FRAMEWORK

Technology Integration in Specialized Academic Libraries

The rapid advancement of Information and Communication Technology (ICT) has fundamentally reshaped the landscape of higher education library services. In academic institutions, resource centers are transitioning from traditional, print-bound repositories into dynamic, technology-enabled learning spaces (Hussain, 2023). Within specialized fields such as Islamic Studies, research activities heavily depend on voluminous primary sources, including multi-volume Hadith compilations, biographical encyclopedias (*‘Ilm al-Rijāl*), and legal commentaries (*Syarh*).

Physical limitations such as constrained shelf capacity, high procurement costs for rare manuscripts, damaged volumes, and restricted borrowing policies frequently hinder seamless academic workflow. To mitigate these physical bottlenecks, academic libraries are increasingly adopting mobile technologies that support the *Bring Your Own Device* (BYOD) framework (Alshaikh et al., 2024). BYOD enables student researchers to utilize personal smartphones or tablets as seamless portals for accessing cloud-based academic resources without requiring specialized hardware installations (Hussain, 2023).

QR Code Applications in Mobile Learning and Islamic Heritage Studies

Quick Response (QR) code technology, originally created by Denso Wave in 1994, has evolved into a ubiquitous physical-to-digital interface. Capable of storing up to 7,089 alphanumeric characters, a two-dimensional QR code allows mobile cameras to instantly decode and route users toward designated Web URLs, cloud documents, or multimedia assets without manual typing.

In educational contexts, QR codes foster frictionless mobile learning (m-learning) by bridging physical learning environments with digital assets (Saprudin et al., 2014). In Islamic studies specifically, mobile platforms have demonstrated high efficacy in simplifying complex textual structures, such as mapping chains of Hadith narrators (*Sanad*) and cross-referencing text variants (*Matan*) (Alshaikh et al., 2024; Hamisan et al., 2019).

By attaching QR codes directly to physical bookshelves, a concept known as a "Wall Library", institutions can create a hybrid physical-digital repository. Students browsing physical shelves can instantly scan codes to access complete, high-resolution digital facsimiles (PDFs) hosted on open-access waqf repositories (such as Waqfeya.com). This setup bypasses physical borrowing restrictions and expands access to missing or out-of-print volumes.

Theoretical Framework: Delineating ADDIE, TAM, and ISO/IEC 25010

To establish a rigorous measurement design, this study delineates three distinct theoretical frameworks:

1. ADDIE Model (Branch & Dousay, 2024): Serves exclusively as the operational development pipeline guiding the system's creation.
2. Technology Acceptance Model (TAM) (Davis, 1989): Serves as the user adoption framework evaluating two primary psychological dimensions: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU).
3. ISO/IEC 25010 Product Quality Model (ISO/IEC, 2023): Serves as the software usability evaluation standard, operationalizing PEOU and PU into three concrete quality constructs: (i) Efficiency (task performance speed and productivity gains), (ii) Effectiveness (interaction clarity and operational skill acquisition), and (iii) Satisfaction & Ease of Use (visual interface appeal and overall preference).

Rather than imposing these frameworks post-development, the evaluation instrument was systematically mapped to these dimensions:

1. Efficiency Items (Q1–Q6): Map to TAM Perceived Usefulness and ISO 25010 Performance Efficiency.
2. Effectiveness Items (Q7–Q12): Map to TAM Perceived Ease of Use and ISO 25010 Operational Effectiveness.
3. Satisfaction & Environment Items (Q13–Q14): Map to ISO 25010 Satisfaction and infrastructure operational constraints.

In this study, the 19 evaluation items utilized during the ADDIE framework's final stage were synthesized into three operational usability dimensions aligned with ISO/IEC 25010 and TAM standards (ISO/IEC, 2023):

- **Efficiency:** Assessing task execution speed, academic productivity, and workflow simplification.
- **Effectiveness:** Evaluating operational clarity, system flexibility, and ease of acquiring operational skill.
- **Satisfaction & Ease of Use:** Measuring user visual satisfaction, interface clarity, and overall system preference.

The conceptual mapping between physical/digital components and usability dimensions is illustrated in Figure 1.

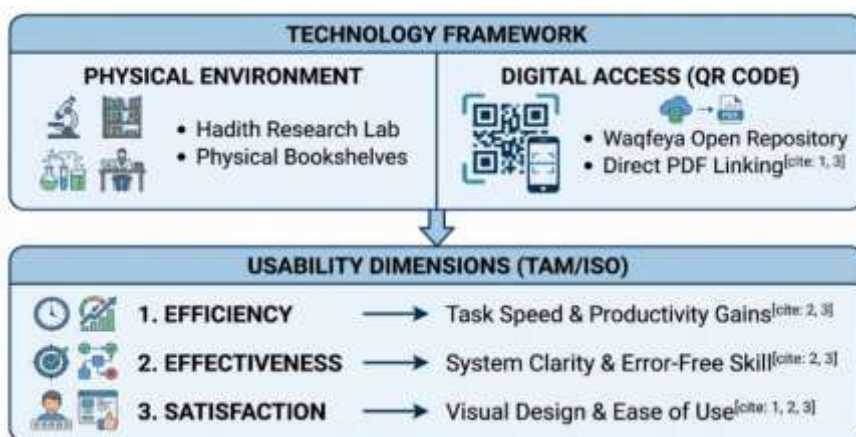


Figure 1: Technology Framework of Wall Library

Comparative Matrix of Access Technologies

Selecting the appropriate digital access medium requires balancing deployment costs against operational complexity. Table 1 provides a comparative matrix evaluating QR Code Wall Libraries against alternative library access technologies:

Table 1: Comparative Analysis of Digital Access Technologies in Resource Centers

Criteria	Quick Response (QR) Code	Radio-Frequency (RFID) / NFC	ID	Dedicated App / Portal	Mobile
Capital Expenditure (CapEx)	Near Zero (Standard printing)	High (Hardware tags, readers, portals)		High (Custom software engineering)	
Operational Expenditure (OpEx)	Low (Re-printable upon damage)	Moderate (Tag replacement & recalibration)		Continuous server & OS maintenance	
User Prerequisites	Standard Smartphone Camera	NFC-capable hardware	mobile	App store download & account creation	
Deployment Speed	Immediate (Rapid generation & mounting)	Slow (Hardware infrastructure setup)		Slow (Development & App Store review)	
Friction Level	Instant point-and-scan link opening	Proximity tap required		Multi-step navigation & login	

Strategic Justification and Identified Research Gap

While advanced infrastructure technologies such as RFID/NFC and native mobile applications offer robust tracking mechanisms, their substantial capital requirement (CapEx) and ongoing maintenance costs (OpEx) present major barriers for specialized academic departments operating under tight fiscal constraints. Furthermore, requiring students to download proprietary applications introduces user friction (such as storage limitations, OS compatibility issues, and account registration barriers). In contrast, the QR Code Wall Library model provides an optimal, sustainable balance:

1. **Zero Licensing and Capital Cost:** Utilizing open-access PDF repositories (Waqfeya.com) and free vector generation tools (*QR Code Monkey*) eliminate software procurement expenses.
2. **Frictionless BYOD (Bring Your Own Device) Integration:** Leveraging students' existing smartphones allows instantaneous document access via native camera decoders without custom app installations.
3. **Resilience and Rapid Maintenance:** Damaged or lost shelf posters can be reprinted instantly at nominal cost, ensuring continuous resource availability.

Despite these advantages, existing literature predominantly focuses on QR code implementation in general university libraries for orientation or event marketing (Hussain, 2023). A distinct research gap exists regarding the systematic design, deployment, and empirical usability evaluation of a dedicated QR Code Wall Library within a specialized Islamic research facility. This study directly addresses this gap by utilizing the ADDIE instructional framework to develop and evaluate a tailored hybrid access solution for the Hadith Research Laboratory at FPQS, USIM.

METHODOLOGY

This study utilized the **ADDIE (Analysis, Design, Development, Implementation, Evaluation)** instructional system design framework to build and validate the QR Code Wall Library. The ADDIE model provides a structured, iterative development pipeline ideal for technology-enhanced learning tools.

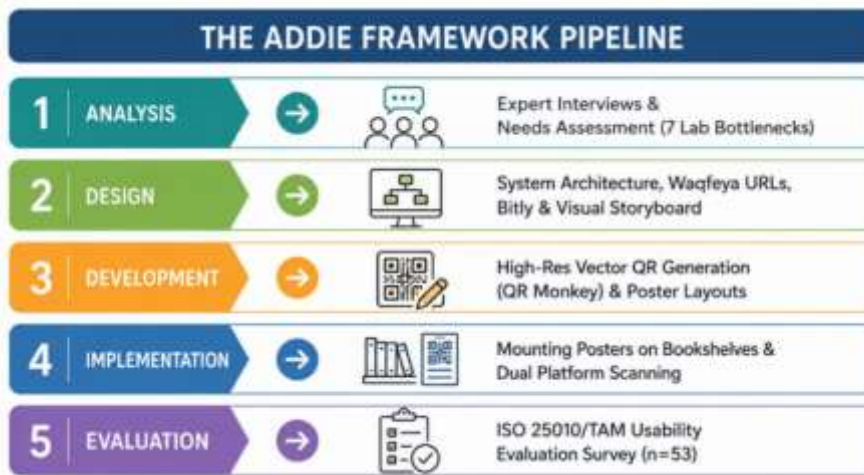


Figure 2: The ADDIE Framework Pipeline for Wall Library Development

Phase 1: Analysis (Needs Assessment & Expert Consultation)

The initial analysis phase aimed to identify operational bottlenecks within the FPQS Hadith Laboratory and determine core curriculum requirements. Data collection during this phase involved two primary mechanisms:

1. **Physical Facility Auditing:** Inspection of physical book collections, shelf arrangements, and laboratory space capacities.
2. **Semi-Structured Expert Interviews:** Consultations were conducted with two Subject Matter Experts (SMEs) who are senior Hadith academics at FPQS (Dr. Ahmad Izzuddin Abu Bakar, interviewed September 19, 2019, and Dr. A. Irwan Santeri Doll Kawaid, interviewed September 23, 2019).

The expert interview protocol utilized a semi-structured format addressing four core questions:

- *Q1:* Do you believe the current Hadith Laboratory environment effectively supports student and lecturer learning?
- *Q2:* Do the existing physical facilities in the laboratory meet user requirements?
- *Q3:* How beneficial would a digital wall library project be for students studying Hadith?
- *Q4:* What are the primary, most frequently referenced Hadith compilations utilized in laboratory teaching sessions?

The analysis revealed **seven major operational problems**:

1. **Insufficient Copies:** Most compilations existed as single physical copies, causing usage conflicts during simultaneous student requests.
2. **Management Gaps:** Lack of dedicated library management personnel led to disorganized shelves.
3. **Borrowing Restrictions:** Books could not be removed from the laboratory, restricting research outside operating hours.
4. **Physical Damage & Loss:** Multiple classical sets contained missing, incomplete, or physically deteriorated volumes.
5. **High Acquisition Costs:** Procurement of imported multi-volume classical Arabic Hadith sets required significant funding.

6. **Maintenance Budget Deficits:** Absence of dedicated budget mechanisms to replace damaged or lost physical volumes.
7. **Spatial Constraints:** Small physical lab footprint unable to accommodate large student cohorts simultaneously.

Phase 2: Design (System Architecture & Software Pipeline)

The design phase established the structural layout, user interface (UI), and technical specifications required to build the Wall Library. System design focused on creating a frictionless physical-to-digital interface.

1. Hardware Specifications Utilized for System Development:

- *Workstation:* CPU Intel® Core™ i5-8250U @ 1.60GHz (1.80 GHz) with NVIDIA GeForce MX150.
- *Memory:* 12.00 GB RAM.
- *Peripherals:* High-definition optical webcam, standard keyboard/mouse, and desktop printer.
- *Testing Smartphone:* Sony Xperia XZ running Android OS.

2. Software Pipeline and Digital Repositories:

- *Waqfeya.com Repository:* Selected as the primary open-access source repository hosting high-resolution PDF facsimiles of classical Arabic Hadith literature.
- *Bitly Service:* Utilized for short-URL processing and analytics tracking to monitor download traffic for each Hadith title.
- *QR Code Monkey:* An online vector engine chosen to generate high-resolution, dynamic QR codes without expiration dates or scanning limits.
- *Adobe Suite & Microsoft Office:* Employed for graphic design, typographic formatting, and structural layout arrangement.

Phase 3: Development (QR Generation & Visual Layout)

During development, the physical poster interfaces were constructed following SME recommendations. Development Workflow Steps:

1. **Link Harvesting:** Direct PDF access URLs for selected Hadith collections were gathered from Waqfeya.com.
2. **URL Optimization:** URLs were shortened and encoded using Bitly to ensure minimal QR matrix density, optimizing camera scan speeds.
3. **QR Vector Generation:** High-resolution PNG codes were rendered via *QR Code Monkey* at maximum density settings to prevent pixelation during physical printing. Custom center icons were embedded to denote document types.
4. **Interface Assembly:** Using Adobe Illustrator and Microsoft Word, poster layouts were constructed featuring three visual elements:
 - High-resolution image of the original physical book cover.
 - Arabic metadata box including book title (*Ism al-Kitab*), author (*Al-Mu'allif*), and publisher (*Al-Nashir*).

- Volume-indexed matrix of QR codes corresponding to individual volume numbers (*Al-Juz' / Al-Mujallad*).

Phase 4: Implementation (Mounting & Operational Guidance)

Implementation involved physical deployment within the Hadith Laboratory and initial system testing. Printed poster sheets were mounted directly onto shelf headers matching physical book categories. Scanning Protocols for End-Users:

1. **Mobile Devices (Android/iOS):** Users connect to campus Wi-Fi or mobile data, open any standard camera or QR Scanner application, point at the volume-specific code, and click the pop-up URL to view or download the PDF.
2. **Desktop/Laptop Computers:** Users open a web browser, navigate to a browser-based scanner (e.g., *WebQR.com*), allow webcam access, hold the printed QR sheet to the webcam, and click the generated link.

Phase 5: Evaluation (Usability Instrumentation, Sampling and Validation)

The final phase evaluated system usability, interaction effectiveness, and user satisfaction among target end-users.

1. **Population and Sampling Procedure:** The target population comprised undergraduate students at FPQS enrolled in courses requiring intensive Hadith Takhrīj research and laboratory access ($n \approx 120$). Using a purposive sampling strategy targeting core lab users, 65 students were invited to participate. A total of 53 student researchers successfully completed the evaluation, yielding an 81.5% response rate.
2. **Instrument Validation and Reliability:** Prior to full deployment, the questionnaire underwent face and content validity checks by two Subject Matter Experts (SMEs). To eliminate item redundancy and improve psychometric quality, overlapping items were consolidated. An internal consistency reliability analysis conducted on the evaluation dataset yielded an overall Cronbach's alpha (α) of 0.892, confirming high scale reliability.
3. **Sub-Dimension Mapping and Descriptive Metrics:** Items were measured on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). In addition to positive response percentages, item Mean (M) scores and Standard Deviations (SD) were calculated to provide standardized evaluation metrics.

Research Timeline, Digital Sustainability, and Link Maintenance

Primary empirical data collection, expert interviews, and initial prototype deployment were executed during 2019–2020 within an undergraduate research project. To prepare the manuscript for scholarly publication, the study underwent comprehensive theoretical reframing, method alignment, and literature updates incorporating 2023–2024 scholarly sources.

Regarding system sustainability, because QR codes route to external waqf repositories (*Waqfeya.com*) via shortened Bitly URLs' link targets are managed centrally through the Bitly administrative dashboard. If an external domain migrates or changes file paths, redirection URLs are updated centrally in the dashboard without requiring physical re-printing or re-mounting of poster displays. A system audit performed prior to publication confirmed that all primary QR matrices remain active and operational.

Ethical Considerations

This study adhered to standard ethical protocols for human participant research. Prior to survey administration, informed consent was obtained from all 53 student participants, emphasizing voluntary participation, data anonymity, and strict confidentiality. Explicit consent was granted by both Subject Matter Experts (Dr. Ahmad



Izzuddin Abu Bakar and Dr. A. Irwan Santeri Doll Kawaid) allowing the publication of their names and expert contributions with this academic study.

FINDINGS AND DISCUSSION

System Cataloging and Selected Hadith Corpus

Based on expert consultations, 25 major Hadith compilations were cataloged and integrated into the Wall Library system. The corpus was categorized into four primary academic divisions, as enumerated in Table 2: Division 1 (Takhrij Hadith, items 1–18), Division 2 ('Ilm al-Rijāl, items 19–23), and Divisions 3 & 4 (Supplementary Musnad & Sunan literature, items 24–25).

Table 2: Comprehensive Wall Library Hadith Catalog & Volume Allocations

Category & Book Title (Arabic Name)	Author / Compiler	Total Vol
Division 1: Takhrij Hadith (Primary Sources & Cross-Referencing)		
1. <i>Al-Mu'jam al-Mufahras li Alfāz al-Ḥadīth</i>	A. J. Wensinck	7
2. <i>Tuhfah al-Ashrāf bi Ma'rifah al-Aṭrāf</i>	Jamāl al-Dīn al-Mizzī	13
3. <i>Jam' al-Jawāmi' (Al-Jāmi' al-Kabīr)</i>	Jalāl al-Dīn al-Suyūṭī	25
4. <i>Sunan al-Tirmidhī (Al-Jāmi' al-Kabīr)</i>	Abu 'Isā al-Tirmidhī	6
5. <i>Tuhfah al-Ahwadhī Syarḥ Jāmi' al-Tirmidhī</i>	Al-Mubārakfūrī	10
6. <i>Ṣaḥīḥ al-Bukhārī</i>	Abu 'Abdullāh al-Bukhārī	1
7. <i>Fath al-Bārī Syarḥ Ṣaḥīḥ al-Bukhārī</i>	Ibn Ḥajar al-'Asqalānī	13
8. <i>Ṣaḥīḥ Muslim</i>	Muslim ibn al-Ḥajjāj	2
9. <i>Al-Minhāj Syarḥ Ṣaḥīḥ Muslim</i>	Yahyā ibn Syaraf al-Nawawī	1
10. <i>Al-Sunan al-Kubrā</i>	Aḥmad ibn Syu'aib al-Nasā'ī	12
11. <i>Dhakhīrah al-'Uqbā Syarḥ al-Mujtabā</i>	Muḥammad ibn 'Alī al-Athyūbī	42
12. <i>Al-Musnad al-Jāmi' (Sunan al-Dārimī)</i>	Abdullāh al-Dārimī	1
13. <i>Muwaṭṭa' Mālik</i>	Mālik ibn Anas	2
14. <i>Musnad al-Imām Ahmad ibn Ḥanbal</i>	Ahmad ibn Ḥanbal	50
15. <i>Sunan Abī Dāwūd</i>	Sulaymān ibn Ash'ath al-Sijistānī	7
16. <i>'Awn al-Ma'būd Syarḥ Sunan Abī Dāwūd</i>	Syams al-Ḥaq al-'Aẓīm Abādī	2
17. <i>Sunan Ibn Mājah</i>	Ibn Mājah al-Qazwīnī	2
18. <i>Syuruh Sunan Ibn Mājah</i>	Jalāl al-Dīn al-Suyūṭī	2
Division 2: 'Ilm al-Rijāl (Biographical Evaluation &		

Narrator Criticism)		
19. <i>Taqrīb al-Tahdhīb</i>	Ibn Ḥajar al-‘Asqalānī	1
20. <i>Tahdhīb al-Tahdhīb</i>	Ibn Ḥajar al-‘Asqalānī	15
21. <i>Ta‘jīl al-Manfa‘ah bi Zawā‘id Rijāl al-A‘immah al-Arba‘ah</i>	Ibn Ḥajar al-‘Asqalānī	2
22. <i>Tahdhīb al-Kamāl fī Asmā’ al-Rijāl</i>	Jamāl al-Dīn al-Mizzī	35
23. <i>Al-Kamil fī Du‘afā’ al-Rijāl</i>	Ibn ‘Adī al-Jurjānī	9
Division 3 & 4: Supplementary Musnad & Sunan Literature		
24. <i>Musnad Abī Ya‘lā al-Mawṣilī</i>	Abu Ya‘lā al-Mawṣilī	16
25. <i>Al-Muntaqā min al-Sunan al-Musnadah</i>	Ibn al-Jārud al-Naysābūrī	1

Source: Hanafiah et al. (2020)

Wall Library User Interface and System Prototype

To ensure seamless visual interaction and minimize cognitive friction among users scanning physical shelves, the system interface was designed using a standardized visual hierarchy. As illustrated in Figures 3, 4, and 5, each printed poster layout integrates three essential visual modules:

1. **Physical Cover Artwork:** A high-resolution facsimile image of the physical book cover located on the laboratory shelf.
2. **Metadata Identification Box:** Bibliographic details formatted in Arabic text including book title (*Ism al-Kitab*), author (*Al-Mu'allif*), and publisher (*Al-Nashir*).
3. **Volume-Indexed Matrix:** A grid of custom QR codes individually mapped to specific volume numbers (*Al-Juz' / Al-Mujallad*) linking directly to complete digital PDF facsimiles hosted on open-access waqf repositories.



Figure 3: Single-Volume Book Interface Design

Source: Hanafiah et al. (2020)

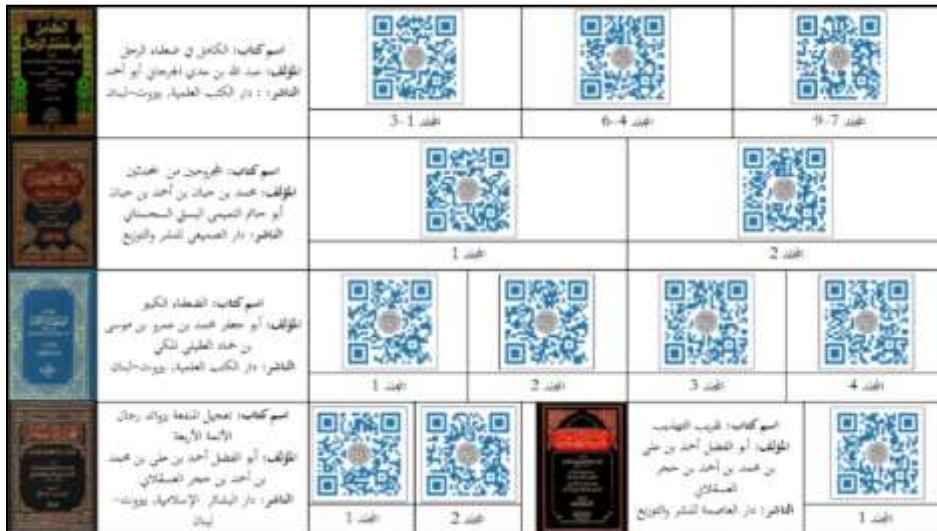


Figure 4: Multi-Volume Compilation Interface Design

Source: Hanafiah et al. (2020)

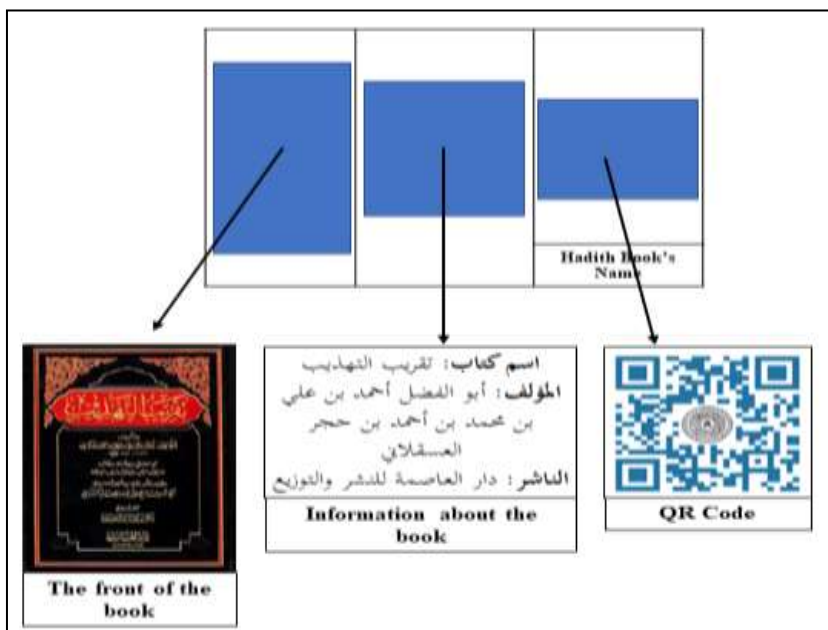


Figure 5: Structural Module Component Layout

Source: Hanafiah et al. (2020)

4.3 Comprehensive Demographic & Behavioral Analysis

A total of 53 student researchers completed the system usability evaluation. Demographic analysis indicated a gender ratio of 77.4% female ($f=41$) and 22.6% male ($f=12$). By program of study, 62.3% ($f=33$) were enrolled in Bachelor of Quranic Studies with Multimedia (QM), 30.2% ($f=16$) in Bachelor of Quranic and Sunnah Studies (QS), and 7.5% ($f=4$) in Sunnah Studies with Information Management (SPM). Final-year students (Year 4) dominated the evaluation sample at 83.0% ($f=44$), reflecting the primary user demographic actively conducting advanced *Takhrīj* research and final-year undergraduate projects within the laboratory.

Prior to system exposure, respondents' baseline research habits were examined regarding their preferred referencing technique and the specific Hadith literature categories searched within the laboratory. Findings indicated that 54.7% ($f=29$) of student researchers regularly utilized digital reference methods, whereas 45.3%

($f=24$) relied on manual physical browsing. Regarding literature types, *Takhrīj Hadith* compilations were the most heavily sought-after resource (90.6%, $f=48$), followed by *‘Ilm al-Rijāl* biographical dictionaries (24.5%, $f=13$). This behavioral baseline strongly validates the SME recommendations gathered during the ADDIE Analysis phase. The complete demographic and behavioral breakdown is summarized in Table 3.

Table 3: Comprehensive Respondent Demographic Profile and Research Hab (n = 53)

Demography	Frequency (f)	Percentage (%)
Gender Distribution		
Male	12	22.6%
Female	41	77.4%
Academic Program Of Study		
Bachelor in Quranic Studies with Multimedia (QM)	33	62.3%
Bachelor in Quranic and Sunnah Studies (QS)	16	30.2%
Bachelor in Sunnah Studies with Info Management (SPM)	4	7.5%
Year Of Study		
Year 2	1	1.9%
Year 3	8	15.1%
Year 4	44	83.0%
Primary Referencing Technique Preference		
Digital Method	29	54.7%
Manual Physical Method	24	45.3%
Frequently Searched Literature Category*		
Takhrīj Hadith Resources	48	90.6%
‘Ilm al-Rijāl (Biographical Dictionaries)	13	24.5%
Specialized Commentary / Multimedia / Other	3	5.7%

*Note: Multiple selections allowed.

Source: Hanafiah et al. (2020)

Detailed Usability Item Analysis (ISO 25010 / TAM Dimensions)

The evaluation questionnaire items were mapped onto three ISO 25010 / TAM usability constructs. To provide standardized metrics as recommended in usability evaluation procedures, both Mean (M) scores, Standard Deviations (SD), and positive agreement percentages (Agree/Strongly Agree) were computed across all items, as presented in Table 4.

Table 4: Item-by-Item Usability Evaluation Breakdown (n=53)

Item & Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean (M)	SD	Positive (%)
Construct 1: Efficiency & Productivity (TAM PU/ISO Performance Efficiency)								
Q1. Enables faster task completion	2	2	7	27	15	3.96	0.94	79.2%
Q2. Improves overall work performance	1	2	9	25	16	4.00	0.88	77.4%
Q3. Increases research productivity	1	3	6	28	15	4.00	0.88	81.1%
Q4. Enhances work effectiveness	2	2	11	22	16	3.91	0.97	71.7%
Q5. Makes assignment execution easier	1	3	5	31	13	4.02	0.82	83.0%
Q6. Overall useful in my work	1	3	9	26	14	3.92	0.87	75.5%
Construct Mean Efficiency Score:						3.97	0.89	78.0%
Construct 2: Effectiveness & Interaction Clarity (TAM PEOU/ISO Effectiveness)								
Q7. Learning to operate system was easy	1	2	9	25	16	4.00	0.88	77.4%
Q8. Easy to perform desired actions	1	2	13	22	15	3.91	0.88	69.8%
Q9. System interaction is clear & understandable	1	2	10	27	13	3.92	0.85	75.4%
Q10. System interaction is flexible	1	4	10	25	13	3.85	0.91	71.7%
Q11. Easy to become skillful in usage	3	2	8	24	16	3.91	1.02	75.5%
Q12. Overall system is easy to use	1	2	9	24	17	4.02	0.89	77.4%
Construct Mean Effectiveness Score:						3.94	0.91	74.5%
Construct 3: General Satisfaction & Environment (ISO Satisfaction & Constraints)								
Q13. Satisfied with Wall Library visual design	2	0	13	26	12	3.92	0.87	71.7%
Q14. Free from internet connection issues	14	0	16	23	0	3.11	1.12	43.4%
Construct Mean Satisfaction Score (excluding Q14):						3.92	0.87	71.7%

Source: Hanafiah et al. (2020)

In-Depth Discussion & Qualitative Synthesis

The empirical findings confirm that the QR Code Wall Library received highly favorable user evaluations in supporting academic research workflows. Under Efficiency, 83.0% ($f=44$) agreed that the system simplified task execution ($M=4.02$, $SD=0.82$), while 81.1% ($f=43$) reported perceived productivity gains ($M=4.00$, $SD=0.88$) [cite: 6]. It is important to emphasize that these findings reflect perceived usability and subjective productivity improvements reported by student researchers rather than objectively measured retrieval timing or speed metrics.

In classical Hadith research, students traditionally spend considerable time locating physical volumes across multiple shelves [cite: 6]. Misplaced or borrowed volumes often halt research workflows entirely [cite: 6]. By scanning volume-indexed QR codes, users instantly download PDF facsimiles directly onto personal mobile devices, converting physical search friction into active analysis time [cite: 6].

Regarding Effectiveness, 77.4% ($f=41$) noted that learning to operate the Wall Library required minimal effort ($M=4.00$, $SD=0.88$) [cite: 6]. The visual mapping of physical book covers adjacent to Arabic metadata and structured QR matrices minimized cognitive load [cite: 6]. Users did not need to install proprietary mobile software, relying instead on native mobile camera decoders [cite: 6].

Regarding Satisfaction, Q13 (Visual UI Design Satisfaction) achieved a 71.7% positive response rate ($M=3.92$, $SD=0.87$) [cite: 6]. Overall construct satisfaction across the visual interface averaged $M=3.92$ ($SD=0.87$), demonstrating strong overall user acceptance [cite: 6].

Concerning system infrastructure, Q14 received only a 43.4% positive rating regarding freedom from internet connectivity problems ($M=3.11$, $SD=1.12$), identifying wireless network stability as a primary operational bottleneck [cite: 6]. Because document retrieval relies on real-time PDF streaming from cloud repositories, local campus Wi-Fi congestion directly impacts access speed [cite: 6]. To resolve this infrastructure limitation, future institutional scaling should implement local server mirroring (hosting PDF collections directly on internal university servers) and offline document caching on lab terminals to eliminate external internet dependencies.

CONCLUSION AND RECOMMENDATIONS

This study successfully designed, deployed, and evaluated a QR Code Wall Library for the Hadith Research Laboratory at USIM using the ADDIE framework [cite: 6]. By converting physical space limitations into a digital gateway, the system addresses issues regarding incomplete book sets, high replacement costs, and space restrictions [cite: 6]. Empirical evaluation confirms high user satisfaction and substantial perceived productivity gains among student researchers [cite: 6].

Key Recommendations:

1. **Color-Coded Classification:** Implement color-coded QR poster layouts based on classical Hadith taxonomy (Takhrij, Rijāl, Fiqh al-Hadīth) [cite: 6].
2. **Infrastructure Upgrades & Local Mirroring:** Establish local server mirroring for PDF files and enhance wireless access point (AP) bandwidth within the Hadith Laboratory to prevent download timeouts during peak hours [cite: 6].
3. **Objective Performance Testing:** Future research should incorporate objective usability measurements, such as comparing physical vs. QR task-completion times and document retrieval success rates.
4. **Institutional Expansion:** Scale the Wall Library framework to other specialized resource rooms across the university [cite: 6].

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Author Contributions

A. Irwan Santeri Doll Kawaid prepared the facility for project implementation, contributed to initial data collection and administered users' evaluation to the project. Mohamad Zahid Hanafiah, Nurul Syafiq Jafar,

and Hani Athira Ahmad Safari contributed to the initial system design, data collection, and execution of the evaluation survey. Syed Najihuddin Syed Hassan supervised the original research project, conceptualized the journal manuscript, performed the theoretical re-framing, revised the literature review, and prepared the final paper for publication.

REFERENCES

1. Abu Bakar, A. I. (2019, September 19). Personal interview on Hadith laboratory requirements and literature cataloging [Unpublished raw data]. Faculty of Quranic and Sunnah Studies, Universiti Sains Islam Malaysia.
2. Alshaikh, K., Al-Hawari, F., & Al-Zoubi, M. (2024). Digital transformation in Islamic higher education: Bridging Naqli and Aqli sciences through mobile technologies. *Journal of Educational Technology in Higher Education*, 21(1), 45-62.
3. Branch, R. M., & Dousay, T. A. (2024). *Survey of Instructional Development Models* (6th ed.). Association for Educational Communications and Technology (AECT).
4. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
5. Davis, F. D., & Venkatesh, V. (2023). Revisiting the Technology Acceptance Model in the digital library environment. *Computers & Education*, 198, 104760.
6. Doll Kawaidd, A. I. S. (2019, September 23). Personal interview on Hadith laboratory requirements and literature cataloging [Unpublished raw data]. Faculty of Quranic and Sunnah Studies, Universiti Sains Islam Malaysia.
7. Hamisan, N. S., Yama, P., & Masrop, N. A. M. (2019). Mobile learning in the study of Hadith: A study on students' understanding on the arrangement of Sanad with specific symbol. *International Journal of Modern Trends in Social Sciences*, 2(7), 100-114.
8. Hanafiah, M. Z., Jafar, N. S., & Safari, H. A. A. (2020). *Developing Wall Library for Hadith Laboratory*. Final Year Project Report. Nilai: Universiti Sains Islam Malaysia.
9. Hussain, A. (2023). Use of QR code technology in academic libraries: A review of the literature. *Library Hi Tech News*, 40(3), 12-16.
10. ISO/IEC. (2023). *ISO/IEC 25010:2023 Systems and software engineering — Product quality model*. International Organization for Standardization.
11. Nurhasanah, S., & Rahmawati, D. (2023). Application of ADDIE model in developing digital learning resources for Islamic studies. *International Journal of Learning and Teaching*, 15(2), 88-101.
12. Saprudin, A. A., Goolamally, N., & Latif, L. A. (2014). Embedding QR code in the teaching and learning process. *Seminar Kebangsaan Pembelajaran Sepanjang Hayat 2014*, 1-10.