

A National Framework for the Assessment and Benchmarking of Digitalization Effectiveness in Sri Lankan Public Libraries

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Abstract

Digitalization of the public libraries is an essential indicator of institutional efficiency and service improvement, however there are no evidence-based frameworks to assess such initiatives available globally, especially in the context of developing countries. In Sri Lanka, large amounts of public money have been invested in the digitalization of libraries, but their sustainability is questionable, and some of them have ended up being underutilized or abandoned. The existing measures of digital success or benchmarking of digitalization effectiveness in public libraries are limited to the current evaluation criteria, which are based on the assessment of the Sri Lanka National Productivity Secretariat, Provincial Councils and other means, which do not fully reflect the broader aspects of the quality of services, user adoption, and sustainability.

The paper presents a unique, context-specific national model to assess and rank the benchmarking of digitalization effectiveness of Sri Lankan public libraries-filling a significant gap in the international library literature. The research methodology was a combination of secondary analysis of guidelines and manuals, structured interviews of librarians of

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digitized public libraries, and a focused literature review. Based on the existing evaluation models, namely the DeLone and McLean Information Systems Success Model, SERVQUAL, Unified Theory of Acceptance & Use of Technology (UTAUT), and ICTA Digital Maturity Model the study combined the strengths of these models into a tailored model. The resulting 100-point scoring system assesses libraries on weighted areas such as technological infrastructure, service quality, user engagement, and sustainability, with each indicator having a particular point value depending on its relative significance.

The suggested framework contributes to the academic debate on the assessment of digital libraries and can be used as a policy instrument. It facilitates evidence-based funding, transparency, and helps libraries to know where to improve. It is specifically designed to be relevant to the unique public library ecosystem in Sri Lanka, and to provide a replicable model to other developing countries

Keywords: library digitalization, library quality assurance, public library evaluation, digitalization effectiveness

Introduction

Citizen-centric governance, interoperable data sharing, and human-centred service design are the key priorities of the national digital agenda of Sri Lanka, as envisaged by the National Digital Economy Strategy 2030 and the National Digital Government Policy, the two documents that outline the way forward to a responsive and inclusive Connected Digital Government (Information and Communication Technology Agency [ICTA], 2020; Ministry of Technology, 2023). Amidst this sweeping change, public libraries, of which there are about 1,375 across the country, are still not well-integrated, even though they are central to equitable access to

information, digital inclusion, and lifelong learning (Department of Cultural Affairs, 2022). Despite periodic implementation of government-funded digitization projects, their applicability and results are inconsistent, and in many cases, they are not in line with the current digital-government priorities due to the lack of a nationally standardized evaluation system.

The e-government studies warn that the contribution of technology is not enough to create more value to the population, and the effectiveness of the governance capacity, the quality of the services, and user-centred adoption should be gauged (United Nations, 2020; World Bank, 2016). At the same time, the digital-library scholarship advocates multi-dimensional assessment models incorporating usability, collection/content quality, service quality, system performance, and user outcomes rather than single-dimensional and input-oriented measures (Saracevic, 2004; Xie, 2021).

Research Aims and objectives

This study aims to develop a uniform, evidence-based national system of measuring and benchmarking digitalization in Sri Lankan public libraries, which combine the aspects of technological innovation, service quality, user adoption and satisfaction, and long-term sustainability. In order to realize this goal, specific objectives are set: (1.) Determine the existing national and local practices criteria that are applied to measure digital success in Sri Lankan public libraries, (2.) Identify a set of key performance indicators (KPIs) through the consideration of their influence on the system functionality, quality of services, sustainability, and user satisfaction and in line with the digital Government Policy and (3.) Build a clear and open 100-point scoring rubric with domain and indicator weights, which allows consistent benchmarking and comparative ranking at national and provincial levels.

Literature Review

Digitalization of public libraries is becoming recognized as the basis of equitable access to knowledge. In Sri Lanka, however, such initiatives are evaluated in a very fragmented manner. Research by Gunawardana (2018) in the Colombo District and Perera and Kumara (2021) in the Kandy and Anuradhapura District Public Libraries indicates that, even with the introduction of key services like Online Public Access Catalogues (OPACs) and a few e-resources, the outdated infrastructure, remaining skill deficits, and the lack of a national evaluation system all work against the development of meaningful performance standards. Policy mandates also exist in the form of citizen-centric digital services, especially the National Digital Economy Strategy 2030 and the Digital Government Policy (ICTA, 2020; Ministry of Technology, 2023), which are not focused on public libraries, which leads to adhoc funding and poor systematic management. On this background, Marasinghe(2022) criticizes infrastructural and policy mismatches in open-source library automation(digitalization). In comparison, the global models like the Digital Maturity Model in India (Sharma, 2019), the adaptation of the SERVQUAL instrument in the United Kingdom (Jones et al., 2020) and the sustainability-oriented framework in Canada (Smith and Lee, 2022) are the integration of technological, service, governance, and environmental indicators. Collectively, the evidences show that although the public libraries in Sri Lanka have embraced some of the essential digital technologies, there is an urgent need to implement wider structural reforms, especially in infrastructural modernization, professional development, policy alignment, and outcomes assessment to ensure they remain viable in the long-term.

This review synthesises evidence across several sectors to show good practice in the transparent design and use of benchmarking

mechanisms and indicator weighting. A practical example is the use of weighted domain scores in the National Institutional Ranking Framework (NIRF) in India by Kumar and Balaji (2021), and the same degree of methodological rigour is evident in the use of the Analytic Hierarchy Process in library evaluation by Hassanzadeh (2023). The importance of aligning the evaluation measures with the governmental goals is seen in the policy-aligned e-government evaluation in Pakistan by Hassan and Lee (2019). All these views point to the need to have a coherent, evidence-based, KPI-based national system of Sri Lankan public libraries, where evaluation, benchmarking and ranking procedures are aligned with the wider goals of digital governance and sustainability.

Research Methodology

A mixed-methods design was used to formulate a framework to assess the digitalization of public libraries in Sri Lanka. The approach combined practitioner-based empirical evidence with scholarly and policy-based evidence to generate an evaluation framework that was practically useful and theoretically informed. The data were collected using four modalities: (i) National digital-government policies and public-library guidelines, (ii) Structured interviews with 18 public-library staff selected using purposive sampling, (iii) Observation memos based on the professional experience of the researchers(authors), and (iv) Relevant scholarly and grey literature on digital-library evaluation. Document analysis was used to identify extant criteria, structured interviews explored system use and service delivery, professional observations highlighted operational gaps, and a targeted literature review identified indicators within existing evaluation constructs.

Thematic analysis of interview and observation data themes were identified in relation to system use and operational challenges (Braun &

Clarke, 2006). The convergence of evidence across data sources resulted in a comprehensive and empirically supported framework that integrated practitioner experience with theoretical constructs, thereby providing valuable insights for the digitalization of public libraries in Sri Lanka. The evaluation practices in Sri Lankan public libraries are heterogeneous. The interviews with 18 public librarians in all nine provinces showed that only six of them, Western, Central, Southern, North Western, Uva, and Sabaragamuwa, perform annual performance assessment. The criteria used in these exercises, which are carried out through questionnaires, the submission of individual annual performance reports, and site visits by external committees, are largely similar. However, the scope of digitalization is limited; key indicators are concerned with (i) web-based library management system, (ii) the type of software used, and (iii) smart card-based services. Wider digital aspects, such as quality of online services, user adoption and satisfaction, innovation in service delivery, and sustainability of digital initiatives, are mostly not addressed.

Results and Discussions

The landscape of Evaluation Practices in Sri Lankan Public Libraries (Objective 1)

In policy alignment terms, there is no nationally agreed approach to measuring digital maturity or success in the public library sector. In addition, the national developed e-government evaluation frameworks have not been aligned to the sector specific needs, indicating a policy-practice gap. This disconnect is indicative of the dissonance between national visions of a connected, citizen-focused digital government and the lack of broad standards that connect operational realities with digital policy priorities. The results highlight the need to have a coherent framework to

align daily library operations with national digital strategies and be compatible with global best practices in the measurement of library performance (International Federation of Library Associations and Institutions [IFLA], 2021; Organisation for Economic Co-operation and Development [OECD], 2020).

Identification of Key Performance Indicators (KPIs) (Objective 2)

The KPI framework that is being analyzed was developed through the combination of internationally recognized evaluation frameworks and Sri Lanka Digital Governance Policy and Governance Framework (ICTA, 2022a) to ensure both contextual applicability and methodological soundness. The ICTA Digital Maturity Model (ICTA, 2022b), provides an organized perspective to evaluate technological preparedness and gradual ability enhancement. The DeLone& McLean IS Success Model (DeLone& McLean, 2003), provides strong measures of system quality, information quality, and user satisfaction; at the same time, the Unified Theory of Acceptance and Use of Technology [UTAUT] (Venkatesh et al., 2003) captures behavioural variables that affect the adoption of the user. The SERVQUAL model (Parasuraman, Zeithaml, & Berry, 1988) makes sure that the quality of service is measured in terms of the user in the dimensions of reliability, responsiveness, assurance, empathy, and tangibility. Collectively, the models provide a multi-dimensional assessment method that can align library digitalization assessment with national e-government goals, thereby balancing technical performance, service delivery, and user experience.

Key Performance Indicators (KPIs) for Evaluating and benchmarking Library Digitalization Success (Objective 3)

The process of selecting key performance indicators (KPIs) was based on a systematic, model-integrated approach that systematically covers four interconnected dimensions, including system functionality, service quality, sustainability, and user satisfaction, and is congruent with the Digital Governance Policy and Governance Framework of Sri Lanka. The framework was based on the ICTA Digital Maturity Model, DeLone and McLean Information Systems Success Model, UTAUT, and the SERVQUAL model. This methodological approach guarantees the comprehensiveness of the resulting KPIs by integrating both technical and socio-technical perspectives, thereby capturing technological readiness alongside user adoption, service quality, and long-term sustainability.

The measures of engagement that are based on organizational integration programs should be anchored on stringent evaluation systems. The proposed analytical structure in this paper is based on the ICTA Digital Maturity Model, DeLone & McLean IS Success Model, SERVQUAL Service Quality Model, and UTAUT Model aligned with the Digital Governance Policy in Sri Lanka. The resulting taxonomy provides full coverage of the four domains needed to achieve operational excellence, namely System Functionality, Service Quality, Sustainability, and User Satisfaction and Adoption.

The System functionality measured based on digitalization software under the category of Library Management (LMS). The functionalities of cataloguing, circulation, OPAC, reporting, and external database interoperability of LMSs were considered as basic framework for evaluation of system. System or the service reliability is quantified in terms of percentage uptime, error rate and recovery time. Interoperability Readiness addresses integrations with e-government systems, other libraries and digital repositories. Data Security Compliance involves

adherence to the Data Protection Act in Sri Lanka and security standards of digital governance.

Service Quality is operationalized by the dimensions of SERVQUAL and the Digital Governance Policy. Service Responsiveness includes turnaround time of digital service requests, and Accuracy & Reliability of Digital Services includes error-free transactions and successful user queries. Accessibility & Inclusivity must follow Web Content Accessibility Guidelines (WCAG) and support multiple languages, and User Support Services is a measure of the accessibility and responsiveness of digital helpdesks, chatbots, or AI support.

The sustainability is measured based on three criteria: ICT Resource Optimization (adoption of open-source, energy-efficient servers, and cloud); Financial Sustainability (sufficient budgetary allocation and recurrent funding of maintenance and upgrades); and Capacity Building (continuous professional development in digital skills). Finally, the correspondence with provincial and national e-government strategies also contextualizes these activities within Policy and Governance.

The User Satisfaction and Adoption metrics combine the information of UTAUT, DeLone& McLean, and SERVQUAL models. User Adoption Rate shows the proportion of active users of digital services. Perceived Usefulness reflects user feedback on knowledge access enhancement. Ease of Use includes the ratings of navigation, search, and interface. Overall Satisfaction Score aggregates feedback from periodic user surveys.

Diagram 01 shows the policies and theoretical frameworks the integration sketch

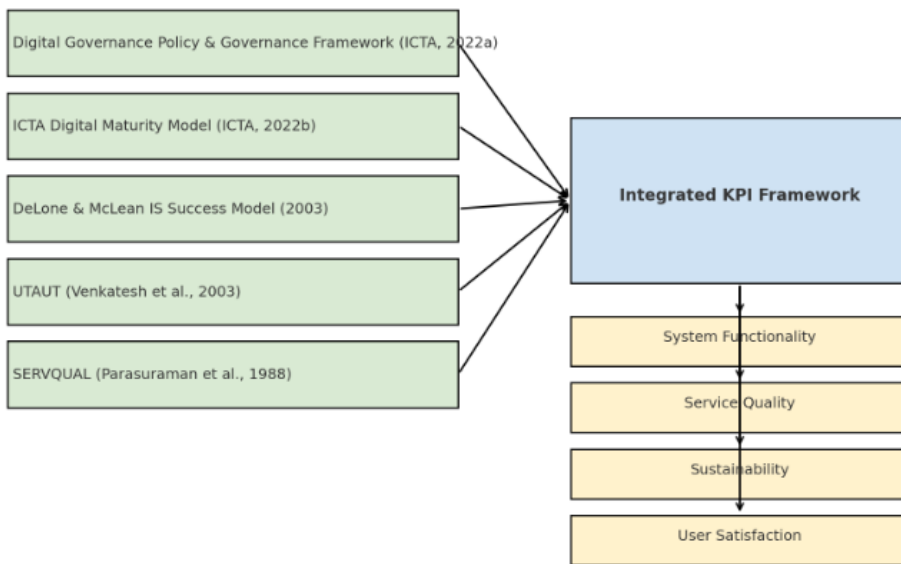


Diagram 01: The Model Integration

Identified Key Performance Indicators (KPIs) from the integrations;

Evaluation of the key performance indicators (KPIs) related to the following integrations (*Diagram 01* shows that there is a four-fold division:

1. System functionality (ICTA Digital Maturity Model and the DeLone& McLean IS Success Model)

- *LMS Capability Index*: the extent of the functions provided (cataloguing, circulation, OPAC, reporting, integration with external databases).
- *System Reliability*: percent uptime, error rate and recovery time.
- *Interoperability Readiness*: degree of system integration with e-government systems, other libraries, and digital repositories.
- *Data Security Compliance*: the Data Protection Act of Sri Lanka and the digital governance security regulations.

2. Service quality (SERVQUAL and Digital Governance Policy)

- Service Responsiveness: mean time to turnaround online service requests.
- Precision and Dependability of Digital Services: error-free transactions and successful user queries.
- Accessibility & Inclusivity: compliance with Web Content Accessibility Guidelines (WCAG) and the possibility to work with several languages.
- User Support Services: access and responsiveness of digital helpdesk, chatbots, or AI support.

3. Sustainability (ICTA Digital Maturity Model, Digital Governance Policy)

- ICT Resource Optimization: open-source, energy-efficient servers, and cloud.
- Financial Sustainability: budgetary allocation and periodic funding of system maintenance and upgrades.
- Capacity Building: continuous professional training of the employees in digital skills.
- Policy & Governance Alignment: the alignment of library digital services with provincial and national e-government strategies.

4. User Satisfaction & Adoption (UTAUT, DeLone& McLean IS Success Model and SERVQUAL)

- User Adoption Rate: the proportion of users using digital services.
- Perceived Usefulness: the user response to the extent to which digital services improve access to knowledge.
- Easy to use: user ratings of navigation, search, and interface design.

- Overall Satisfaction Score: a combination of user satisfaction survey results that are conducted periodically.

100-points Scoring Rubric with Domain and Indicator Weights

Domain weighting prioritizes user satisfaction and adoption (30%) as the ultimate measure of digitalization success, followed by system functionality (25%) and service quality (25%) as the core enablers of performance. Sustainability (20%) ensures long-term operational, financial, and policy alignment, making the framework balanced between technical capacity, service delivery, and lasting impact.

100-Point Scoring Rubric for Evaluating Library Digitalization Success

1). System Functionality – 25 Points

- LMS Capability Index – 8 points
- System Reliability – 6 points
- Interoperability Readiness – 6 points
- Data Security Compliance – 5 points

2)Service Quality – 25 Points

- Responsiveness – 6 points
- Accuracy and Reliability of Digital Services – 5 points
- Accessibility and Inclusivity – 7 points
- User Support Services – 7 points

3) Sustainability – 20 Points

- ICT Resource Optimization – 5 points
- Financial Sustainability – 5 points

- Capacity Building – 5 points
- Policy & Governance Alignment – 5 points

4) User Satisfaction and Adoption – 30 Points

- User Adoption Rate – 8 points
- Perceived Usefulness – 8 points
- Ease of Use – 7 points
- Overall Satisfaction Score – 7 points

Scoring Benchmark (Table 01)

The scoring benchmark is a systematic process of measuring the performance of an institution in the field of digital library services, thus allowing the evaluators to understand scores in a consistent manner and to base sound improvement strategies.

85–100	Excellent	Fully meets or exceeds best practice benchmarks; serves as a national model.
70–84	Good	Meets most KPIs with minor gaps in performance
55–69	Moderate	Adequate but with significant improvement needed in multiple areas.
Below 55	Low	Falls below minimum acceptable standards for digital service delivery.

Table 01- Criterion for Scoring Benchmark

Conclusion

The study reveals that the current assessment and benchmarking of digitalization effectiveness of digital initiatives are not consistent and aligned with the government policies; the current practices include only the basic operational checks and do not enable monitoring the progress over

time. A comprehensive KPI set was identified which covers system functionality, service quality, sustainability, and user satisfaction, thereby integrating national policy imperatives with globally accepted evaluation models. The resulting 100-point scoring rubric, which uses weighted domains and indicators, provides a transparent metric framework that enables consistent benchmarking and enables informed, coordinated national and provincial digital transformation.

Suggestion

The KPI framework and scoring rubric is proposed to be tested again with a large sample size in order to validity of the findings.

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