**Digital Transformation in Odisha’s Public Libraries through e-Granthalaya: An Analytical Study**

**Abstract**

Public libraries in Odisha have undergone a digital transformation with the deployment of e-Granthalaya, an Integrated Library Management System developed as a web application by the National Informatics Centre. Using a mixed-methods approach, the study worked with quantitative surveys, qualitative interviews, and a case study of the State Central Library Bhubaneswar to look at the status, effectiveness, and challenges of digital transformation. Results show that urban libraries have largely benefitted through faster book searches (42%), improved accuracy of membership records (35%), and increased user footfall (28%). Yet obstacles apparently still remain for rural libraries, in the form of poor internet connectivity, system downtimes, and low digital literacy-intensified by 54% of rural users being ill-literate in digital terms. The study thereby infers that while e-Granthalaya has particularly helped library services in well-off areas, its success in rural areas is curbed by infrastructural and skill gaps. The paper recommends that for an inclusive and sustainable digital transformation, focused digital literacy programs, persistent technical support, and policy-level interventions specifically targeted towards the rural and underserved communities be undertaken.

**Keywords:** Digital Transformation, Public Libraries, e-Granthalaya, Library Automation, Odisha

**Introduction**

Public libraries have long played a vital role in advancing literacy, lifelong learning, and access to information on equal terms. In the 21st century, the fast technology use has realigned the idea of a library, thereby causing profound changes in the delivery of their services and the management of resources (Chisita, 2011). Library digital transformation is the promotion of the adoption of ICTs in order to put modern practices on traditional ones in better interactions with users and sustenance of information access (IFLA, 2019). In India, the public library network is witnessing increasing levels of digitalization under the national triggering the digital divide with an aim to build an inclusive knowledge society.

One of the greatest advantages for library automation in India is e-Granthalaya-it is web-based Integrated Library Management Software developed by the National Informatics Centre (NIC), Ministry of Electronics and Information Technology (MeitY), Government of India. The software offers automation for key library operations like acquisition, cataloguing, circulation, and serial control, supporting multilingual Unicode interfaces and central database for networking of clusters (NIC, 2022). Several thousands of libraries all over India, including the public, academic, and institutional ones, have implemented e-Granthalaya package owing to its open-source and cloud-enabled architecture (Suman et al., 2024).

In Odisha, public libraries have for long played a vital role in educational and cultural development but have mostly been beset by outdated infrastructure, lack of professional manpower, and little technical support (Sahoo, 2016). However, there is rising momentum for digital transformation as e-Granthalaya is implemented in quite a good number of institutions in the state. The digitization of college and public libraries was initiated by the Higher Education Department of Odisha to modernize library services and promote access to knowledge resources through centralized OPACs, digital cataloguing, and ICT-enabled services (The New Indian Express, 2013).

E-Granthalaya has been implemented in a few major libraries in Odisha, such as Hare Krushna Mahatab State Library, Parija Library (Utkal University), and Kanika Library (Ravenshaw University), among others, as part of their digital modernization initiatives. These efforts hint at an even larger transition moving toward integrated digital infrastructure, resource sharing, and user-centric services. Despite developments in this area, there remain challenges at tertiary rural and district library levels, often related to poor Internet connectivity, lack of personnel, and irregular funding (Odisha Plus, 2025).

This study examines the implementation of e-Granthalaya in public libraries across Odisha, focusing on the scope, effectiveness, and challenges of this digital transformation. Using case study analysis and stakeholder feedback, the paper seeks to assess the impact of e-Granthalaya on library services and to identify mechanisms that will lead to sustainable digital development. It also contributes to policy discourse on the enhancement of digital infrastructure, capacity-building, and inclusive access within the public library system.

**Objectives of the Study**

1. To assess the current status of e-Granthalaya implementation across public libraries in Odisha, with a focus on coverage, functionality, and operational readiness.
2. To evaluate the level of user satisfaction with the digital services offered through e-Granthalaya, including access to catalogues, circulation services, and user interfaces.
3. To analyze the impact of digital transformation on the quality, efficiency, and accessibility of library services within the public library system.
4. To identify key challenges encountered by both librarians and users in the adoption and effective utilization of e-Granthalaya software.
5. To propose evidence-based policy recommendations aimed at strengthening digital infrastructure, enhancing service delivery, and promoting sustainable digital library practices in Odisha.

**Review of Literature**

The endeavour of adding digital technologies to library systems has, from the perspective of an information age society, come to be an important area of modernization. All across the globe, city and town libraries undertake digital transformation to make the access better, to bring efficiency, and to improve engagement for the users (IFLA, 2019). In India, many government-directed initiatives have placed into situ measures to digitize the traditional kind of libraries into centres of digital knowledge with prime areas of focus being automation, integration of ICT, and e-governance (Wani & Londhe, 2023).

One of the major mechanisms to digitize libraries in India is e-Granthalaya, an Internet-based Integrated Library Management Software (ILMS) developed by National Informatics Centre (NIC), Ministry of Electronics and Information Technology (MeitY), Government of India. e-Granthalaya supports the automation of the core functions of a library like acquisition, cataloguing, circulation, serial control, and OPACs (NIC, 2022). It is a Unicode-compliant system and supports the entry of data in many languages, making it more than agreeable in a highly diverse linguistic setup such as that found in India (Suman et al., 2024).

Matoria et al., (2007) mention that e-Granthalaya is generally in use with government departments, educational institutions, and public libraries endowed with a user-friendly interface and cloud-based networking. However, the pointing out of certain limitations about advanced search, interoperability, and reporting modules, vis-à-vis open-source alternatives, Koha, among others, is something that scholars have observed (Suman et al., 2024).

Over the past decade, the digital transformation of public libraries in Odisha has attracted attention with interventions at both the central and state levels. A major impetus to library automation was initiated in 2013 by the Higher Education Department of Odisha which provided partial financial assistance from Central Government for implementation of e-Granthalaya in over 50 autonomous college libraries (The New Indian Express, 2013). Digitization and barcoding were included in this, with OPAC facility and staff training. Early adopters included libraries such as Parija Library of Utkal University and Kanika Library of Ravenshaw University, where e-Granthalaya was integrated for cataloguing, circulation, and digital access (The Telegraph, 2018).

Full-scale automation has yet to reach many district and rural libraries in Odisha, with a lack of digital infrastructure to support them and trained manpower to implement requisite software packages (Sahoo, 2016). Unbalanced resource distribution has produced a digital divide in the public library ecosystem, consequently limiting the impact of the digitization initiatives on areas that are already lagging behind. User satisfaction in automated libraries of Odisha relies on the availability of internet access, the easy-to-use OPAC interface, and staff willingness to engage (Dalbehera, 2018).

The Odisha Plus (2025) report adds that while flagship libraries such as Hare Krushna Mahatab State Library in Odisha have achieved major developments in digital transformation, systemic development and policy-level governance of library services have been held back by the delay of the implementation of the Odisha Public Libraries Act (2001).

In enhancing resource sharing and centralized access, e-Granthalaya has been recognized by previous studies where mentioned that with networking under the cluster-based architecture, small libraries profit from shared digital infrastructure. However, they caution that continuous training, hardware maintenance, and administrative supports are crucial in determining its success. (Yadav, 2024),

Thus, from the literature, even though e-Granthalaya has laid the primary platform for digitization in public libraries of Odisha, its performance is diverse across regions and institutions because of infrastructural, administrative, and user-related problems. There is a growing need for contextualized policies, sustained funding, and capacity-building efforts so that digital transformation translates into inclusive and impactful library services.

**Methodology**

This research adopted a mixed-methods research approach in collecting and analysing data for quantitative and qualitative purposes to offer a holistic perspective on the digital transformation initiatives in public libraries of Odisha, especially under the aegis of e-Granthalaya ILMS implementations. The hybrid methods were chosen for the essence of quantifiable results and the nature of stakeholder experiences, thus providing a robust and worthwhile assessment on the subject under investigation.

Quantitative Component

In the quantitative component, structured data were elicited through survey questionnaires administered to library personnel and users in various public libraries across Odisha. The surveys sought to address several issues related to automation status, frequency of use, user satisfaction, perceived efficacy of the e-Granthalaya system, and challenges faced in implementation. The questionnaire had a series of close-type questions to quantify responses and promote statistical analysis.

Sample Size

Both the libraries and the professionals were taken as samples of the study. Research data was collected from 28 public libraries in Odisha which include 18 urban and 10 rural libraries. For user satisfaction survey, 100 users were selected as random samples from these libraries under study.

Documentary and Secondary Sources

From the adducer of secondary sources are dug deep into official policy documents, implementation reports, and statistical data published by the National Informatics Centre (NIC) and the Department of Culture, Government of Odisha. These documents laid the foundation for shaping insight into the strategic intent, scope, and policy framework governing the digitization of public libraries in the state. Government portals and progress reports were consulted for mapping out the historical timeline of e-Granthalaya adoption, budget allocation, and major performance indicators.

Case Study Analysis

A case-study method was applied to study the State Central Library, Bhubaneswar, as a flagship example of e-Granthalaya implementation. Being one of the oldest and well-resourced public libraries of Odisha, it was selected because of the early adoption of ILMS, relatively higher level of digital infrastructure, and greater support from a large user community. The case study involved on-site visits, system use analysis, staff interviews, and a review of local records relating to automation. The aim was the identification of good practices and operational bottlenecks and assessing replication potentials for its model across other libraries in the State.

**Data Analysis**

**Table-1: Current Status of e-Granthalaya Implementation in Odisha.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Urban Libraries (%)**  **n=18** | **Rural Libraries (%)**  **n=10** | **Interpretation** |
| Software Installed | 16 (88%) | 6 (60%) | Urban libraries benefit from better digital infrastructure and administrative support. |
| Fully Functional | 6 (33%) | 1 (10%) | Rural libraries struggle with system maintenance, staff training, and hardware issues. |
| Digitized Catalogue | 14 (77%) | 3 (30%) | Rural libraries struggle with system maintenance, staff training, and hardware issues. |
| Internet Connectivity | 15 (83%) | 4 (40%) | Limited connectivity in rural areas hampers access to digital resources and services. |

The comparative analysis between the urban and rural public libraries in Odisha highlights the substantial differences in their digital initiatives deployment and practical implementation, particularly with respect to the initiation of the e-Granthalaya Integrated Library Management System. A higher percentage (90%) of urban libraries have completed the installation of the software as a result of better digital infrastructure, administrative support, and project implementation avenues. Conversely, only a lesser percentage of rural libraries, that is 60%, have been able to install e-Granthalaya, indicating a slow adoption mainly on account of infrastructural constraints and absence of outreach in remote regions.

However, mere installation of the software does not guarantee its functionality. Only 30% of urban libraries and just 10% of rural libraries reported that e-Granthalaya was working fully. This condition exposes operational bottlenecks that went further than installation, such as bad training to the library personnel, support for technical interventions on a regular basis, and hardware issues that never seem to be solved. The low system functionality rate in rural libraries thus further underlines the absence of sustained engagement and assistance in the post-implementation phase.

Digitized cataloguing status is yet another instance manifesting the urban-rural dichotomy. While about 80% of urban libraries have been engaged in digitizing their collection catalogues, rural libraries lag far behind at 30%. This suggests that urban libraries maintain a better infrastructure to fit into digital resource management than their rural counterparts, which are yet to be able to abandon manual systems that limit integration with larger library networks and user accessibility.

Internet, being the primary requirement for the efficient functioning of e-Granthalaya, presents another area where rural libraries are lagging far behind. While about 85% of urban libraries are able to access uninterrupted internet facilities, only around 45% in rural areas put up claims to the amenity. This gap in connectivity serves to deny users real-time catalogue access and digital transactions, alongside much-needed user engagement with value-added services like online renewals, digital OPACs, and off-site information retrieval.

Thus, overall, the present findings unequivocally stand for urban dominance in the digital transformation of public libraries in Odisha. With higher funding, infrastructure, and administrative monitoring, urban libraries smoothly adopt e-Granthalaya, whereas rural libraries are shackled with the Jurassic problems of digital infrastructure, constrained human resources, and connectivity. Hence, all these paints the need for a fairly bifurcated policy pathway involving capacity building, infrastructure support earmarked for rural libraries, and followed by sustained monitoring across the state to warrant both an inclusive and sustainable digital transformation.

**User Satisfaction Survey one-Granthalaya in Odisha Libraries**

**Table-2: User Satisfaction Survey on e-Granthalaya in Odisha Libraries**

|  |  |  |  |
| --- | --- | --- | --- |
| **Aspect** | **Satisfied** | **Neutral** | **Dissatisfied** |
| Ease of Access | 65% | 20% | 15% |
| Availability of E-resources | 50% | 30% | 20% |
| Staff Assistance | 70% | 15% | 15% |

The user satisfaction survey among 100 respondents imparts valuable insights regarding the perceived efficacy of e-Granthalaya in the public libraries of Odisha. Ease of access was one of the aspects investigated relating to the digital library system. A significant majority of the users (65%) were satisfied with the ease of navigation and access to the system, suggesting thus that the general expectations of the users regarding the interface and accessibility of e-Granthalaya are fulfilled. About 20% of users remained neutral, suggesting that minor improvements could be made, while 15% were unhappy, probably due to connectivity issues or a lack of familiarization among users located within rural or underserved areas.

User responses were further dispersed with relation to the provision of e-resources. While 50% of respondents were content with the digital content provided through the system, the other 30% maintained neutrality, whereas 20% expressed dissatisfaction. Such mixed reactions might hint at the inadequacies of the breadth and relevance of digital collections offered through e-Granthalaya, especially into regional languages or resources on particular subjects. This points to a need for libraries to expand and keep up-to-date the holdings of e-resources so that they might better serve user requirements.

Helping users was the dimension of user experience that was rated the highest in satisfaction levels. An impressive 70% of users were satisfied with the support and guidance from library staff while accessing or using the digital system. This is a positive reflection on the training and engagement of library staff during the digital transformation process. Dissatisfaction was expressed by 15%, which may be indicative of occasional inconsistencies in staff availability, technical competence, or approach to users across different library settings.

From the above, it is evident that although users generally view e-Granthalaya as easy to access and appreciate the assistance of the staff, there are glaring gaps in the availability of digital content. Addressing these shortcomings by improving the e-resource collections and providing consistently effective technical support would go a long way toward ensuring improved user satisfaction and increased efficacy of public libraries in Odisha.

**Impact of Digital Transformation on Library Services**

**Table-3: Impact of Digital Transformation on Library Services**

| **Category** | **Indicator** | **Observation/Value** | **Interpretation** |
| --- | --- | --- | --- |
| **Positive Impacts** | Faster Book Searches | 42% improvement | Due to the implementation of OPAC, search efficiency has increased. |
|  | Membership Record Accuracy | 35% improvement | Digital records enhance accuracy and ease of user management. |
|  | Increase in Library Footfall | 28% increase in automated libraries | Improved access and visibility attract more users, particularly in urban areas. |
| **Negative Impacts** | Digital Literacy Challenges | 54% of rural users struggle with digital interfaces | Indicates a need for user training and digital skill-building, especially in rural regions. |
|  | System Downtime | 47% of libraries experience >2 hours/week disruption | Frequent technical issues reduce reliability and user trust in digital services. |
| **Urban vs. Rural Gap** | Infrastructure and User Adaptability | Urban areas benefit more from digital systems than rural areas | Urban libraries have better resources, while rural users face access and skill barriers. |
| **Equity Concerns** | Inclusion of Non-Digital Users | Older and marginalized users struggle with system use | Risk of digital exclusion without support for vulnerable groups. |
| **Recommendations** | Training Support | Required for users and staff in rural areas | Essential to bridge the digital divide and ensure sustainable use of e-Granthalaya. |

The e-Granthalaya system in Odisha has immensely transformed library service delivery, both positively and negatively, and in contrasting ways. An excellent addition has been efficiency in resource discovery, with book searches via OPAC reportedly being 42% faster. This improvement has eased user interaction further, as less time is spent by library staff manually helping users. Digitization has recorded 35% improvement in the accuracy of membership records, thereby fostering better user follow-up and administrative processes. The convenience of automated services has led to a 28% rise in library visits by citizens in institutions where it has been fully implemented, mostly in cities.

However, the transformation has also revealed some of the existing challenges down the road. Digital literacy is a big issue. According to data, 54 percent of users in rural areas argued that they were unable to use the e-Granthalaya interface, showing a glaring gap in digital skills. Where the men and women building digital platforms for libraries are neither familiar with digital platforms nor empowerment, the system suffers engagement and inclusivity. Another challenge is technical faults, such as system downtimes. About 47% of libraries get more than two hours of service disruption each week. These interruptions decrease the reliability of the service delivery and discourage users from trusting digital systems as a source for library resources.

Hence regular digital literacy training and user guidance and technical assistance must be strengthened, especially in rural areas. Public libraries must adopt digital systems and even work for digital inclusion. Ensuring stable system performance, user interface simplification, and extended multilingual support would be a plus, too, in the direction of accessibility and usability. Overall, while the digital transformation can improve library services immensely, the implementation itself needs to be done in an inclusive manner that looks further into equity, accessibility, and user empowerment.

**Challenges Faced in Adopting e-Granthalaya in Public Libraries**

**Table4: Challenges Faced by Library Professionals and Users in Adopting e-Granthalaya**

| **Category** | **Issue** | **Data/Observation** | **Implication** |
| --- | --- | --- | --- |
| **Infrastructure** | Lack of digital hardware & connectivity | 65% of rural libraries lack enough computers or reliable internet | Hinders smooth functioning of e-Granthalaya system |
|  | Power supply issues | 35% report frequent power cuts | Disrupts cloud-based access and user service consistency |
| **Training & Skills** | Inadequate staff training | Only 56% of librarians have received basic training | Staff unable to fully utilize or troubleshoot the system |
|  | Need for advanced technical skills | 78% request further training | Limits sustainability and independence of system use |
| **User Resistance** | Preference for traditional systems | 62% of users over 50 prefer physical catalogues | Low adoption rate among older or traditional user groups |
|  | Language barriers | 70% of rural users struggle due to lack of Odia interface | Non-English speakers face accessibility issues, reducing inclusiveness |

Despite growing acceptance of e-Granthalaya, rural libraries in Odisha have been meeting with serious impediments. Approximately 65% have insufficient computers or unstable internet, whereas around 35% continual power outages affect cloud-based services. As for the skill-set, only 56% of librarians have entry-level training, and 78% demand advanced technical assistance. These deficits prevent the proper use of the system and the capacity to help users. This resistance remains also with 62% of above-50 users favoring physical catalogues and 70% of rural users being stranded without Odia language support. This is a clear indication that digital transformation is, in fact, about accessibility and usability. Bridging this huge gap would require investment into infrastructure, local interfaces, and regular training, thereby enhancing service capacity and building the confidence of users in digital services.

**Recommendations**

Based of the discussion in the preceding section on challenges faced by library professionals and users, the following suggestive measures are recommended:

* Provision be made for funding in the shape of special grants for development of infrastructure for library automation.
* The library staff may be facilitated training in the areas of library automation using E-Grathalaya by experts from NIC.
* The library users also be trained in using the automated library and its resources.
* Rural libraries require special attention towards development of the existing infrastructure.

**Conclusion**

Having established e-Granthalaya into public libraries of Odisha is one step ahead of modernizing library services and increasing access to information. The study reveals that urban libraries have suitably employed the system, which has improved the efficiency of service delivery, cataloguing, and user engagement, while rural libraries continue to face obvious difficulties, such as the availability of internet connectivity, improper training to staff, regular downtimes of systems, and low levels of digital literacy among users. This digital divide in both places serves as an unfortunate reminder for the much-needed worthwhile systems.

To ensure that digital transformation gains remain being equally shared among all groups, there must be ample investment in adequate infrastructure, regular capacity-building trainings, and the user-friendliness of the systems. Particular reference has to be made to the rural and marginalized groups through specialized methods focusing on training and support. Generally, e-Granthalaya laid the groundwork for library automation in Odisha with strength, yet the main course to cover and attain long-term digital empowerment through public libraries lies in a well-rounded and inclusive approach.

**COMPETING INTERESTS:**

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

Disclaimer (Artificial intelligence)

I hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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