Understanding Digital Rights Management: From Access Control to User Perceptions

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Abstract

Digital Rights Management (DRM) is a set of technologies and methods used to control access, use, and distribution of digital content, aiming to protect intellectual property rights and prevent unauthorized copying or sharing. This study investigates the awareness, understanding, and implementation of DRM in various types of libraries. A survey was conducted among librarians from academic, public, and special libraries, with 42 responses received. The results show that 90% of the participants are aware of DRM, with 43% having a basic understanding and 43% having a moderate understanding. Most librarians define DRM as a way to protect digital content from unauthorized use. The types of content most commonly protected under DRM are e-books (85%), journals and articles (70%), and audiobooks (40%). While 41% of the libraries have implemented DRM for their digital content, 38% have not, and 21% are unsure about the implementation. The most common DRM technologies used are user authentication, encryption, digital watermarking, and license management. The study highlights the importance of balancing content protection with user experience and the challenges faced by libraries in implementing DRM. Further research is needed to explore the impact of DRM on user access and the development of more user-friendly DRM solutions.

Keywords: Digital Rights Management (DRM), Access control, Usage restrictions, Copy protection, Encryption, Digital watermarking, License management, Content scrambling, Secure key exchange protocols

Introduction:

Globally, the concept of Digital Rights Management (DRM) gained prominence with the World Intellectual Property Organization (WIPO) Copyright Treaty in 1996 and the US Digital Millennium Copyright Act (DMCA) in 1998. In India, DRM protection was implemented through the 2012 amendment to the Copyright Act, which criminalized the circumvention of technical protection. Several industries have adopted this technology to protect their intellectual property from unfair use. Educational institutions are no exception to this. This study was conducted to survey DRM use in different types of libraries for different types of collection.

Objectives:

1. To check the awareness of DRM among librarians and library professionals.
2. Which is the most protected type of digital material in the libraries.

3. To determine the willingness of librarians and library professionals to implement DRM in libraries.
4. How many libraries have implemented DRM?
5. Which DRM technology is the most common among libraries and librarians?

Methodology:

To collect data, a simple and stratified questionnaire was used. Although this concept is not new to librarians, it is not commonly used in libraries. Digital content acquisition, storage, management, and dissemination remain a challenge in some areas of the country. Therefore, basic questions about awareness, acceptance, and implementation were asked by distributing a Google form. The form was sent to the participants via WhatsApp and to the group. The total number of responses to the questionnaire was 42. These responses were analyzed, represented in the form of graphs, and explained further. After analyzing the received data conclusion is drawn.

Scope:

Now a days DRM is implemented in every field of life, e. g. media, banking, film industries, entertainment, railways and airlines etc., this study is limited to the use of DRM in the field of library. Questionnaire is distributed among the working librarians in India. Thus the responses received includes university, college, and school, special and public libraries. No other fields are studies for this research.

Review of literature:

(Saeednia, 2000) succinctly outlined two critical network security concerns in digital libraries: privacy and authentication. This study also proposes practical solutions that can be implemented in digital libraries of any size or type. (Choudhury et al., 2002) delved into DRM technology, which is utilized to control the copying, printing, and sharing of e-books, and posited that a well-managed DRM system could assist libraries in overseeing these services. (Houghton-Jan, 2007) highlighted three reasons libraries should be wary of DRM, such as device compatibility, DRM-related hurdles, and archival issues, and provided a set of recommendations for library staff to consider when discussing DRM with patrons. (Živković, 2008) underscores notable advancements in e-books, along with the evolution of identification systems, digital rights management, and legal deposits, as integral components of digital libraries and cultural heritage. (Böhner, 2008) identified the potential benefits of digital rights management for libraries, and encouraged librarians to adopt a more active role in standardizing and innovating new concepts. (Nicholson, 2009) offers guidance on tackling digital rights management challenges related to libraries' duties and mandates to provide users and learners with unrestricted access to information. (Puckett, 2010) argued that DRM technology impedes libraries' mission to provide access to information by creating deliberate and artificial barriers to information usage. (Hombal & Prasad, 2012) introduced issues concerning copyright protection in the context of digital libraries. (Dryden, 2012) shares findings from an exploratory study of how users of archival material navigate copyright-like restrictions imposed by archives on the reuse of their holdings. (Obasola & Mabawonku, 2013) discovered that none of the respondents was aware of anti-circumvention laws and digital rights management systems. (Ashis Kumar Pal, 2014) suggests that DRM technology be employed

to limit the copying, printing, and sharing of e-books, and a properly managed DRM system could assist libraries in managing these services. (Gunn, 2015) discusses peer-to-peer (P2P) file sharing in the U.S., noting its significance in activism, international law, and digital rights management (DRM). (Dadzie & van der Walt, 2015) investigated the impact of technological advancements on the development of digital libraries in Ghanaian universities, and recommended hiring more multi-skilled librarians to support digital resources and services. (Free, 2015) reports that, as of May 2015, the digital library Journal Storage (JSTOR) transitioned to offer all 25,000 titles in its electronic book (ebook) program exclusively in a DRM-free unlimited-user model. (Frattolillo, 2017) described a DRM system implementation scheme that ensures the copyright protection of digital content through an innovative buyer-friendly watermarking protocol. (Ma et al., 2018) proposed a blockchain-based digital rights management scheme called DRMChain that ensures that the right content is delivered to the right users in the right manner. (Leroy, 2019) discussed the essential features required for an ideal digital preservation solution to mitigate the many risks that endanger digital assets. (Cusker, 2020) Acquiring technical standards connects libraries with vendors who are very protective, legally and technologically, of their products. To conform to the technical restrictions placed on standards, librarians must think creatively and adopt a workflow that is more labor-intensive than other publications. (Roncevic, 2020b) points to new ways in which DRM can be approached in the future and ways in which piracy and illegal online activities can be overcome more successfully. (Rafiq & Khan, 2021) recommended that Library Schools offer compulsory courses and specialization in digital librarianship by offering practical training for librarians to develop and manage digital libraries. (Devi & Kumar, 2023) aim to discuss and highlight the impact of digital rights management on the accessibility of libraries' electronic resources for Blind and Visually Impaired users. Furthermore, it discusses how complex Digital Rights Management violates the fair use rights of BVI users by making it impossible for them to access electronic resources.

Data Analysis:

The data collected through Google Forms are presented in graphs. Each response was shown individually using its own charts. Explanations for each response are included below the corresponding chart. There was a slight difference in the answers to each question in the survey. Most participants' responses fell between 41 and 39 for certain questions. From these responses, conclusions are drawn, and some recommendations are provided.
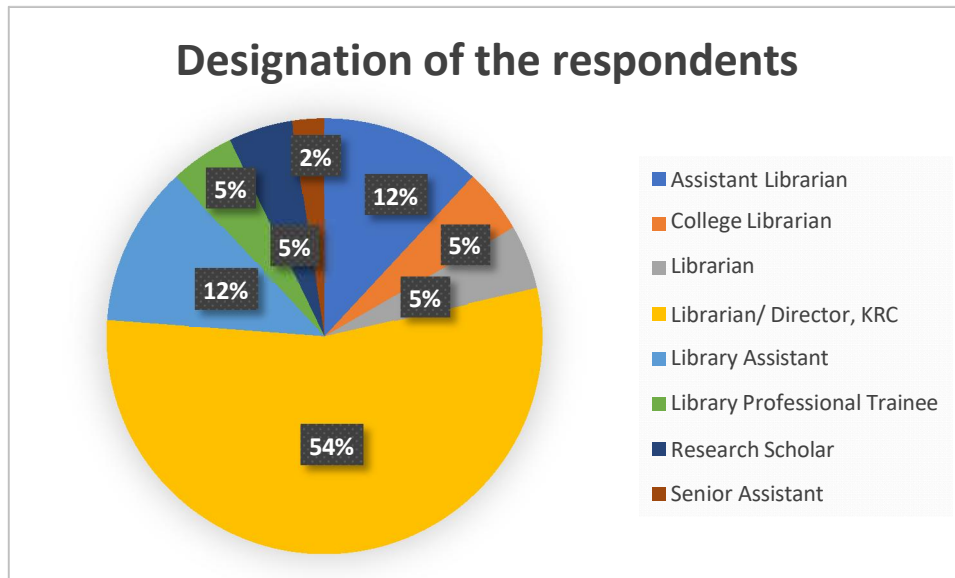
Graph 1 : **Designation of the respondents**

A total of 42 individuals responded to the survey. The accompanying graph displays participants' job titles. It shows that 54% of the respondents were university librarians, while assistant librarians and library assistants comprised 12%. This chart provides further details on the roles of the remaining participants. Regardless of their diverse job titles, all participants were involved, either directly or indirectly, in managing Digital Rights Management access within their respective institutions or organizations.
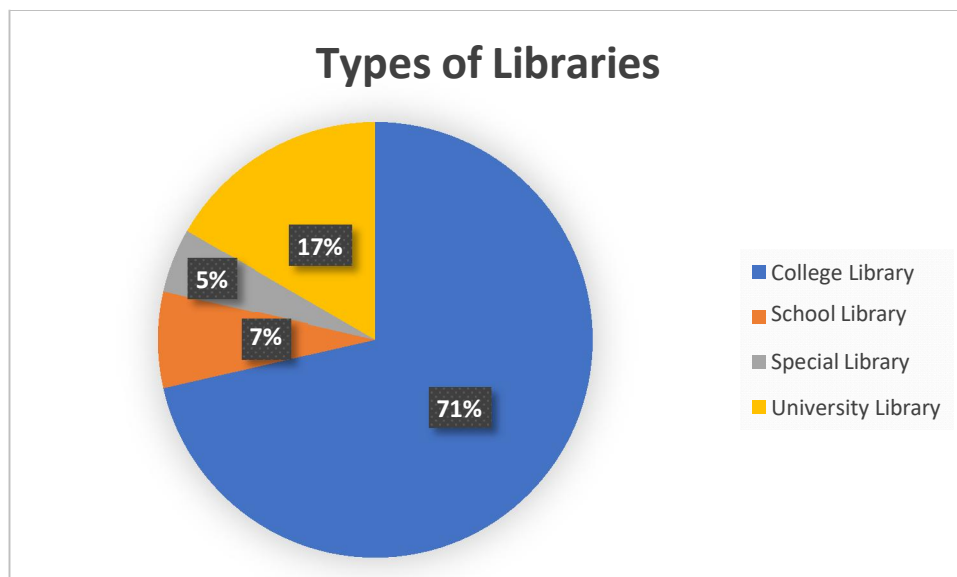

Graph 2: **Types of Libraries**

A total of 42 responses were gathered from various library types, each provided by their respective librarians. The majority of participants in this survey were college librarians. Only 5% of the responses came from special libraries, due to their smaller number compared to academic libraries. The contributions from university and school libraries accounted for 17% and 7%, respectively

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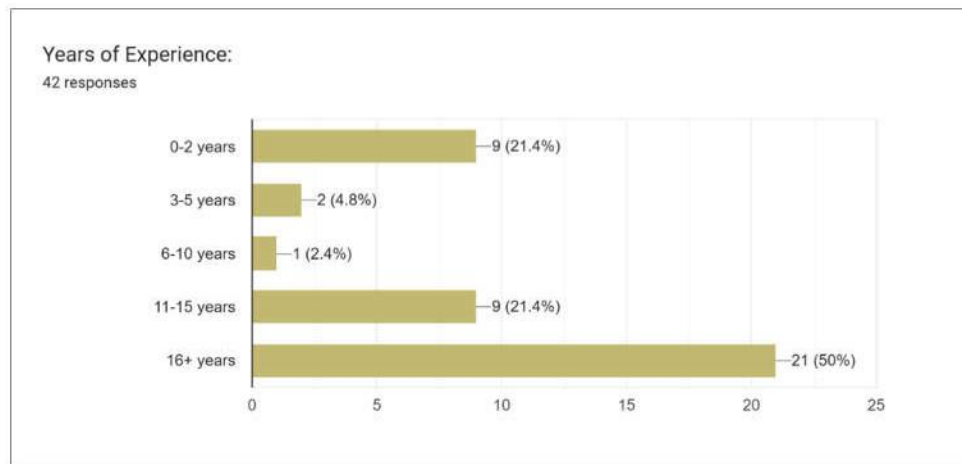
Graph 3: Year of Experience

The above graph shows that the survey participants were employed as librarians. The researcher aimed to determine whether libraries utilize DRM to grant access to digital resources. Only librarians currently working in the field can provide answers to this question
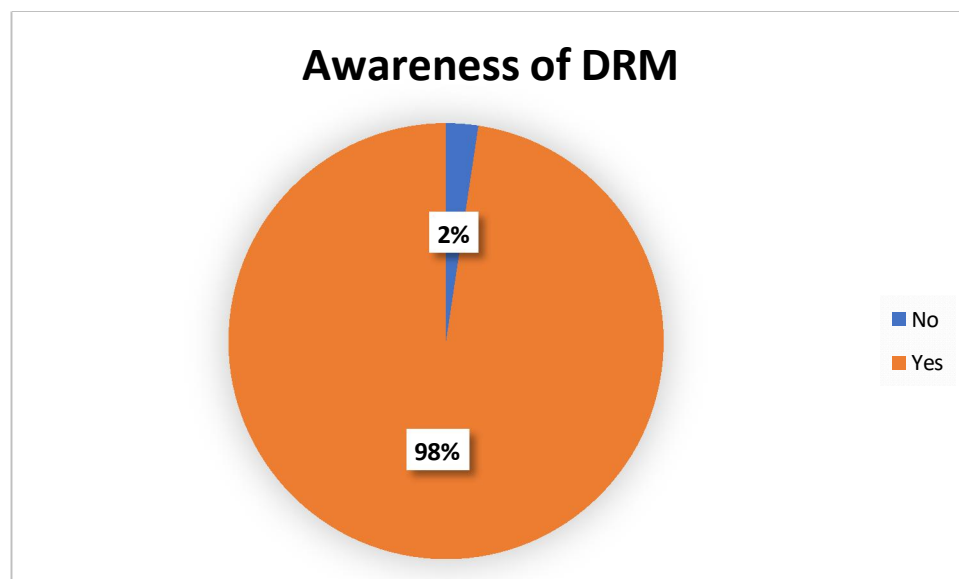

Graph 4: Awareness of DRM

This graph shows the awareness of the participants of Digital Rights Management. Of the 42 participants, 38 were well-aware of the term. It shows a high level of awareness among the participants of DRM use in the different types of libraries for providing access to different types of digital resources.

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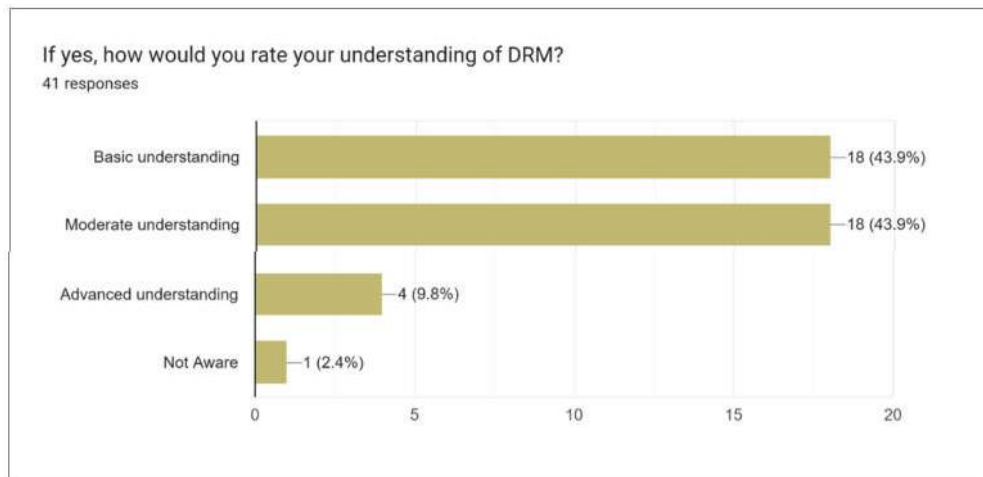
Graph 5: Understanding of DRM

This chart is linked to the previous one, which examined the level of awareness regarding Digital Rights Management among library professionals and librarians. Among the 41 respondents, 18 indicated that they had either basic or moderate understanding. Only four participants possessed an advanced understanding of DRM, and only one individual was completely unaware of it.
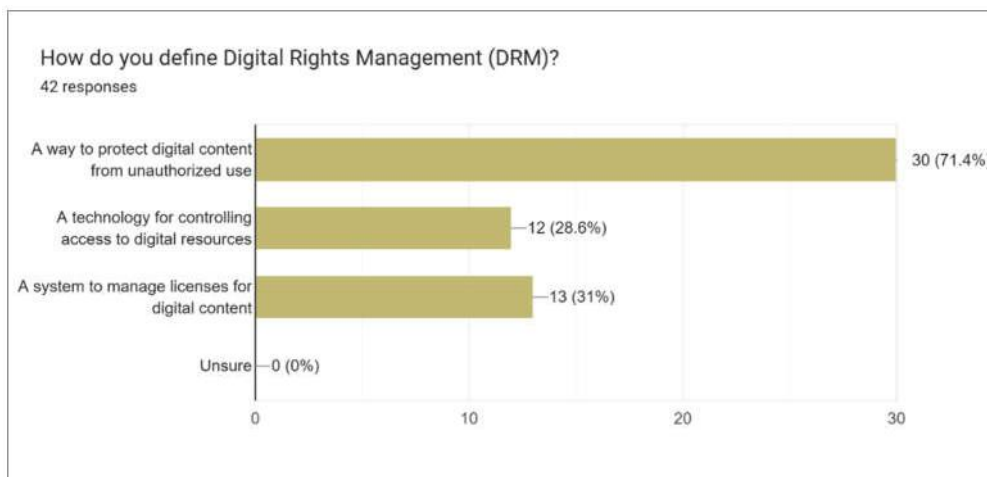

Graph 6 : Defining DRM

When asked to define DRM in the context of libraries, 30 out of 42 respondents described it as "a method to safeguard digital content from unauthorized use." Meanwhile, 12 participants referred to it as "a technology for regulating access to digital resources," and the remaining individuals viewed it as "a system for managing licenses for digital content." These are the various ways in which librarians define DRM.
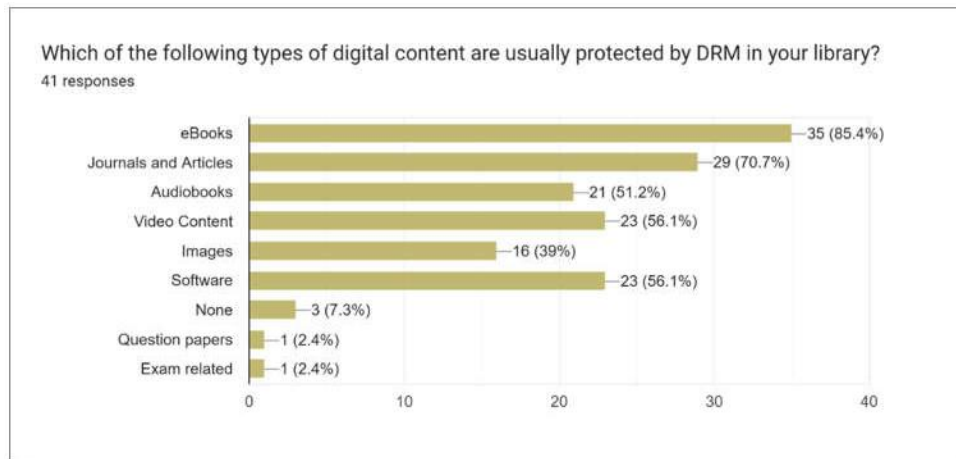
Graph 7: Types of content protected under DRM

The above graph illustrates the varied reactions regarding the types of content safeguarded by DRM across different libraries. A significant portion of feedback, 85% (35), pertains to e-books, which are the most heavily protected digital content. Journals and articles followed, with approximately 70% (29) of responses, making them the second most protected category. In addition, some libraries apply DRM to audiobooks, videos, and software. However, in a few libraries (three, 7.3%), no content was protected.
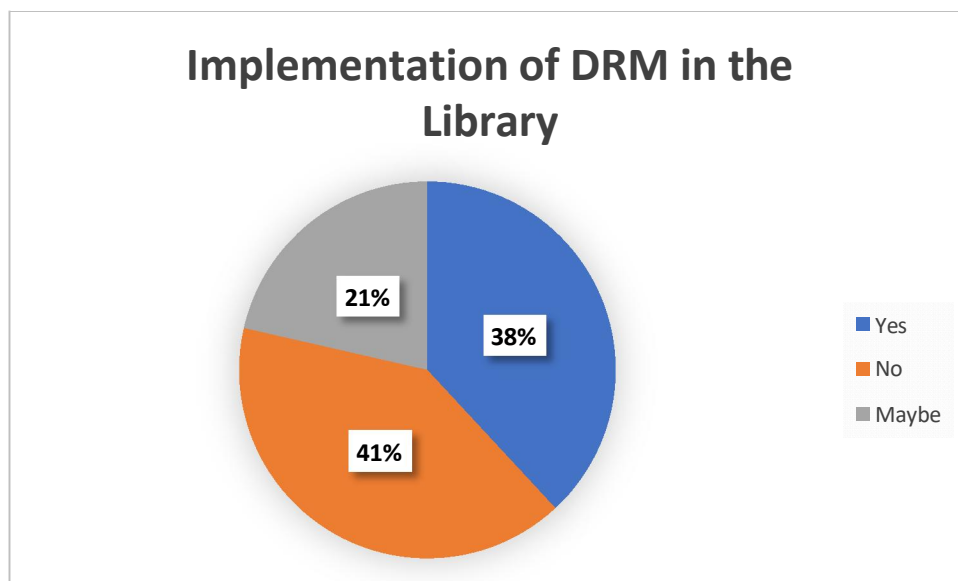
Graph 8: DRM Implementation in the Library

Among the 42 responses, 41% of libraries implemented DRM for their digital content, while 38% had not yet implemented it. Additionally, 21% of libraries remain uncertain whether they have implemented it for digital content up to this point.
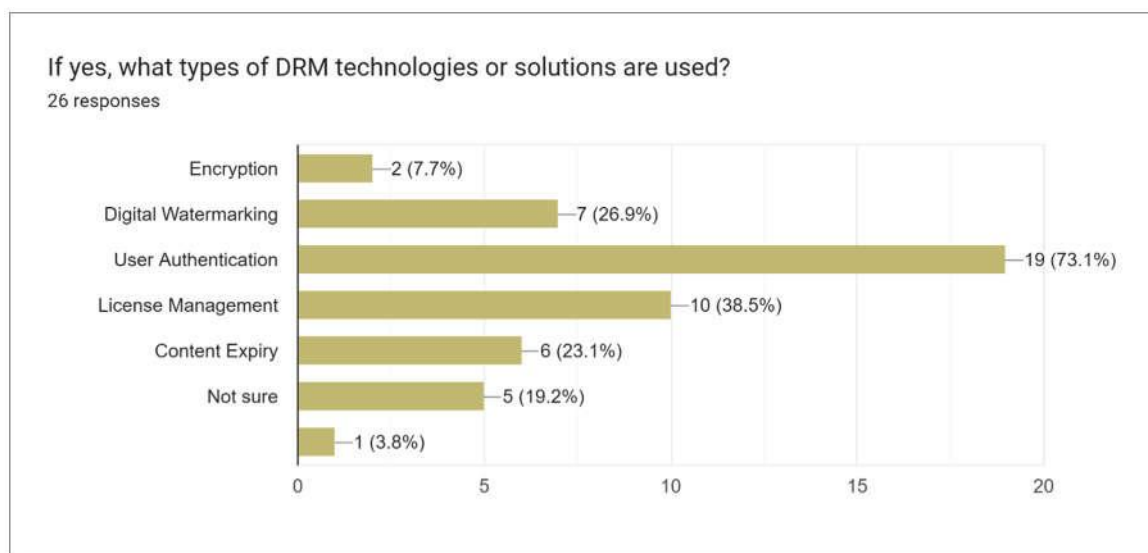
Graph 9 : DRM Technology

This graph relates to a previous question regarding the use of DRM for various content types. It inquired about the technology employed by those who implemented DRM for digital content. The responses varied, with the majority indicating the use of user authentication technology to safeguard the digital content. The chart also displays other responses, including encryption, digital watermarking, license management, and content expiration.

Summary

A survey was conducted among librarians from academic, public, and special libraries to investigate the awareness, understanding, and implementation of Digital Rights Management (DRM) in various types of libraries. The results showed that 90% of the participants were aware of DRM, with most having a basic or moderate understanding. The types of content most commonly protected under DRM are e-books, journals and articles, and audiobooks. While 41% of the libraries have implemented DRM for their digital content, 38% have not, and 21% are unsure about the implementation. The most common DRM technologies used are user authentication, encryption, digital watermarking, and license management.

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