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E-resources Licensing in Artificial Intelligence (AI) Environment: Practices and Innovative Ventures

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E-resources licensing agreements are an essential part of the e-resources ecosystem and are complex legal contracts that the publishers and libraries govern. In these digitally advanced times, agreements have become more complicated due to the rapid pace of technological development and the increasing complexity of electronic resources. Artificial intelligence (AI) in libraries has sparked discussions about its role in e-resources workflows. AI tools aid contract review by flagging problematic terms, and the ability to navigate legal language makes them valuable for libraries and other organisations. However, the role of AI in license review still needs to be explored. The main objectives of this study are to explore the advancement and key features of ERMS and AI tools in the workflow of e-resources license agreements. To explore e-resource licensing practices, highlighting their strengths and limitations in the face of AI's disruptive influence. Also, it explores the issues and challenges that still need to be addressed and how tools can help to enhance the management of e-resources licenses. This study adopts a qualitative research approach to understanding complex and subjective experiences.

Keywords: License agreement, e-resources license, Licensing, Artificial Intelligence, AI, ERMS.

Introduction

The licensing of e-resources in academic libraries is driven by increasing demand, the information landscape revolution, and the need to adapt to new storage, access, and delivery mechanisms. During the era of print media, librarians did not express concern regarding resource licensing. In the present day, scholarly resources have experienced a significant and rapid expansion and have transitioned from print to CD/DVD, ultimately adopting an electronic format. Furthermore, this shift has altered how resources are accessed and stored. The acquisition of e-resource licenses has become indispensable in safeguarding the rights of authors and users and preventing the misuse of scholarly resources and the publishing industry. Consequently, e-resources licensing is pivotal in library administration and collections development.

Electronic resources (e-resources) licensing agreements are legal contracts between a library or institution and a publisher or vendor that govern the terms and conditions of access to and use of licensed content. License agreements regulate the terms and conditions of access to e-databases, e-books, e-journals, and multimedia content. It is imperative to comprehend the legal, ethical, and practical factors associated with these agreements to promote collaboration and protect the interests of content providers and users. Libraries face challenges in understanding and negotiating license agreements, requiring librarians to have legal skills and knowledge of terms used in license agreements[1]. The licensing process for electronic resources in libraries includes key components such as access concerns, vendor support, cancellation and termination, and legal issues[2]. To address the problems in the negotiation process, Electronic Resource Management Systems (ERMSs) and AI tools can help significantly in the digital age. These systems can be standalone software, integrated library systems, or local databases. Implementing ERMSs streamlines workflows and improves electronic resource management[3].

The information landscape is undergoing a significant transformation due to AI, with e-resources licensing being a key area of focus. The proliferation

of electronic resources has transformed traditional scholarly communication, research, and education, necessitating strategic and judicious licensing practices. AI presents both opportunities and challenges for the licensing landscape. However, the role of AI in license review remains unexplored; this software employs natural language processing and machine learning techniques to identify problematic terms and propose revisions, thereby enhancing the efficiency of the review process[4]. Moreover, AI can be leveraged to create licensing guidelines that ensure a consistent approach to reviewing licenses and aid in shaping institutional policies. By harnessing AI technology, libraries and academic institutions can improve the accessibility and effectiveness of their e-resources licensing procedures[5]. Tools can significantly reduce contract review and redlining time, from a few days to a few hours, depending on the length of the contract and improve efficiency and productivity in contract management. The potential for broader adoption of AI contract review software in libraries and other institutions leads to increased efficiency and accuracy in license management processes.

Review of literature

Licensing agreements provide a framework for libraries and publishers to negotiate the terms and conditions under which e-resources can be accessed and used. These agreements pertain to essential elements, including concerns regarding access, utilisation of resources, support from vendors, legal matters, reviewing and renewing. Claire, Dygert., Jeanne, M. and Langendorfer[6] librarians must possess legal expertise and familiarity with the terms of license agreements to negotiate and communicate with publishers and vendors effectively. The establishment of local regulations for licensing aids in uniformity in evaluating license review, thereby harmonising the institution's procedures and policies with the licensing procedure. Ülkü, Özgüven. and Şahika, Eroğlu[7] librarians must be aware of the clauses used in the license agreements, as several significant matters, such as perpetual access, archiving, and self-archiving, are frequently disregarded by publishers.

Singh and Mukherjee[8] examines the impact of commercial publishers' licenses on resource optimisation and highlights key issues often overlooked by these publishers, analysing agreements from five international publishers using public domain models. The study shows that core negotiations focus on price, IP access, display, and ILL/document supply, while minor issues like perpetual access and archiving are minor. Tripathi and Jagjeevan[9] examine the license agreements for electronic books and online databases subscribed to by university libraries, focusing on elucidating the diverse provisions and their impact on these libraries. Before authorising the procurement of licensed content, libraries should ensure that their agreements undergo thorough scrutiny by the legal department of their parent organisation. Regularly organising educational workshops aimed at acquainting students with copyright law, the appropriate utilisation of licensed content, and the potential consequences of non-compliance is a practice that libraries should adopt. Patel, H. and Hanumappa, A.[10] suggest that land law encompasses particular legal stipulations concerning these matters, and certain regulations may be accessible as individual policies at the Institute level. The absence of institutional or organisational norms and the ambiguity in the legal rules constitute some of the primary hindrances to effectively managing libraries for library professionals. Regrettably, insufficient legal knowledge, unfamiliarity with legal requisites, and lack of awareness regarding current or reported cases contribute to inadequate library administration and heighten the probability of library patrons and staff engaging in unlawful activities.

Duggan, L. *et al*.[11] emphasise the importance of efficient workflow design for better accessibility. The authors recommend using templates in electronic management systems and making non-confidential information accessible to staff. The paper also offers practical guidance for handling licensing situations beyond standard procedures. Gilding, J. and Fripp, C.[12] developed a collaborative system AEShareNet to streamline intellectual property licensing so Australian training materials are created, shared and adapted efficiently. The paper highlights the significance of copyright issues in driving e-commerce models, emphasising the economic value of intellectual property and the need for balance in the digital landscape. Linda Frederiksen[13] undertook a survey that underscores the necessity for clear communication of interlibrary loan entitlements for electronic books within and among libraries. Libraries ought to enhance the prominence of resource-sharing entitlements in their operational processes by implementing means of communication for electronic book license

information. This could be attributed to the limited embrace of Electronic Resource Management (ERM) products or the restricted availability of pertinent tools for interlibrary loan personnel. Carolyn Carpan and Alexis Linoski[14] have implemented and discussed ERM tools to manage license agreement workflow and display usage rights to users using the Centralized Online Resources Acquisitions and Licensing module. Co-author discussed using Trello at the Georgia Institute of Technology, and Carolyn Carpan discussed using CORAL at Collection Strategies Unit at the University of Alberta Libraries. Amanda Yesilbas and Susan Davis[15] addressed in a session how they overcame the difficulties of gathering and maintaining data on e-resources for the Florida Center for Library Automation (FCLA) by using Drupal, an open-source content management system. They outlined its benefits and gave an example of utilising it to quickly organise information about electronic resources and make displays that the target audience would find helpful.

Pesch[16] the National Information Standards Organization (NIS) has launched the ONIX-PL License Encoding Project to accelerate the adoption of the 2006 ONIX-PL standard. The project aims to provide an XML encoding that accurately represents the license agreement, can be processed by ERM systems, and is standardised for easy adoption. Yem S. Fong and Heather Wicht[17] discuss the current state of electronic resource management software, focusing on two modules developed for license information tracking. Libraries are exploring various software solutions to streamline resource management and comply with license terms. Examples include Electronic Resource Management module from Innovative Interfaces and journal management services from EBSCO. Rachel A. Erb[18] explains the Florida Virtual Campus's (FLVC) three-year use of the AI contract assessment program Legal Sifter. It describes the unique setup required for the software to function at its best for their requirements. The interaction between machine learning and natural language processing in the software's functionality is also discussed in the study. The program processes an anonymised contract; the result is described, providing examples of highlighting problematic clauses and using the editing function to redline the document. The software's good performance suggests that it can be used as a teaching tool for new employees who have a basic understanding of e-resources licenses.

Objectives of the study

The main objectives of this study are to explore:

- The advancement and key features of ERMS and AI tools used in e-resources license agreements workflow.
- E-resource licensing practices, highlighting their strengths and limitations in the face of AI's disruptive influence.
- The issues and challenges that still need to be addressed in the ERMS and AI tools for license workflow.
- How AI tools can help to enhance better management of e-resources license workflow?

Methodology

This study adopts a qualitative research approach to understanding complex and subjective experiences. This method is often used to explore and understand new phenomena or to gain deeper insights into existing phenomena. Research documents related to this topic have been retrieved from Scopus, Web of Science, and Google Scholar. Analysis involves analysing content to understand its meaning and significance. Also, openly available e-resources license documents were reviewed for a better understanding.

Licensing agreement of e-resources: practices, strengths and limitations

The acquisition and management of electronic resources are crucial for organisations in the digital age. This licensing framework defines information accessibility, intellectual property rights, and the collaborative spirit in our interconnected world. Generally, a good license agreement describes authorised users, such as students, faculty, staff, and other registered members of the institution's/library, to use the licensed content—the licensed content used reading, downloading, printing, and sharing. Period has access to the licensed content such as a one-year subscription, a multi-year contract, or perpetual access. The cost of the license is based on various factors, such as the size of the institution, the type of content, and the number of users. The license agreement clarifies the owner of the intellectual property rights to the licensed content and fair use activities, such as creating and distributing course packs or sharing articles with colleagues and specifies whether interlibrary loan is permitted. Also, it includes various types of reports provided by the

institution or publisher, such as usage statistics or a list of authorised users.

Mutual negotiations of e-resources license agreements are the best for the licensee, licensor, and end users. Institutions/library must inform their end user about the agreement's details, rules, and regulations so that they can access it fearlessly. During the new user's orientation program, library representatives must explain the licensing terms to them, such as user rights and restrictions, copyright and fair use, Inter-Library loan, duration of the access, mode of access, etc.

It is essential to carefully review all e-resources licensing agreements before signing. Institutions/Libraries must review the agreement from the licensed expert and the legal cell to ensure that they understand the terms and conditions of the agreement and that the agreement meets their needs. For librarians, better licensing agreements offer several benefits, such as reducing the administrative burden of managing e-resource licenses, promoting transparency and accountability in the licensing process, improving access to e-resources for users, negotiating better pricing for e-resources, etc. Better licensing agreements can help publishers, too, such as increasing the visibility and usage of their e-resources, reducing the cost of licensing their e-resources, developing stronger relationships with libraries, etc.

Some libraries incorporate Read-and-Publish agreements in their licenses with the publisher to enhance open access initiatives. The agreement would guarantee that the article processing charge (APC), which publishers frequently assess to authors in exchange for the publication of research articles, would be included in the subscription. The institute authors won't have to pay APC if the institutions join into such read-and-publish agreements with journal publishers. Once published, an article automatically comes under open access, and anybody can access the article free of cost.

Systematic downloading of e-resources is one of the major problems for all librarians, and solving this issue is challenging for publishers. Visitors of the campus, guests of the faculty/students, or research scholars, when they see access to the related interested research field articles, start downloading complete issues or too many articles at a time. They feel that they may need access to these journals in the future. In this event, publishers blocked that IP or sometimes stopped all access. Librarians need to resolve the issue and give clarification due to the event happening to restore the journal access.

However, licensing of electronic resources presents several challenges for libraries. The conditions of license agreements can exhibit substantial variations among different publishers and provide complexities that pose challenges to comprehension. Library professionals face complex issues when selecting, negotiating, and providing access to e-resources. Factors like local environment, cataloguing policies, state funding regulations, institutional portals, technology support, and hardware costs affect implementation and performance. The initial effort and benefits must be justified to justify the monetary costs and staff commitment[19].

Figure-1 illustrates the e-resources licensing workflow, encompassing many steps, including identifying resources requisite for research, pedagogy, and learning. The assessment of potential vendors & selection, the negotiation of licensing terms, the thorough examination of the contract, obtaining approvals, ordering and invoicing, signing the agreement, the implementation of the electronic resources access, the assurance of compliance with the stipulations of the licensing agreement, the regular evaluation and users' feedback were important aspects. This systematic approach ensures that electronic resources are procured efficiently, fulfil their requirements, and comply with legal and financial requirements.

Model License for e-resources

Liblicense, LoC and JISC have made model licenses for e-resources and provide services for e-resources licensing to libraries and publishers. These model licenses are helpful for negotiation and save time for both parties. Model License Agreement is a tool designed to help negotiate digital content licenses in higher education and library systems. These licenses are based on US law. Liblicense is free for non-commercial use under a Creative Commons license. Library of Congress (LoC) model license for e-resources mentioned the key terms and followed all associated libraries and institutions. The licensor must adhere to OpenURL standards and provide persistent links, while the library must maintain confidentiality of access passwords and provide no information about the paper's content. The Joint Information Systems Committee (JISC) model licence is the foundation of all license agreements. It was created to reflect

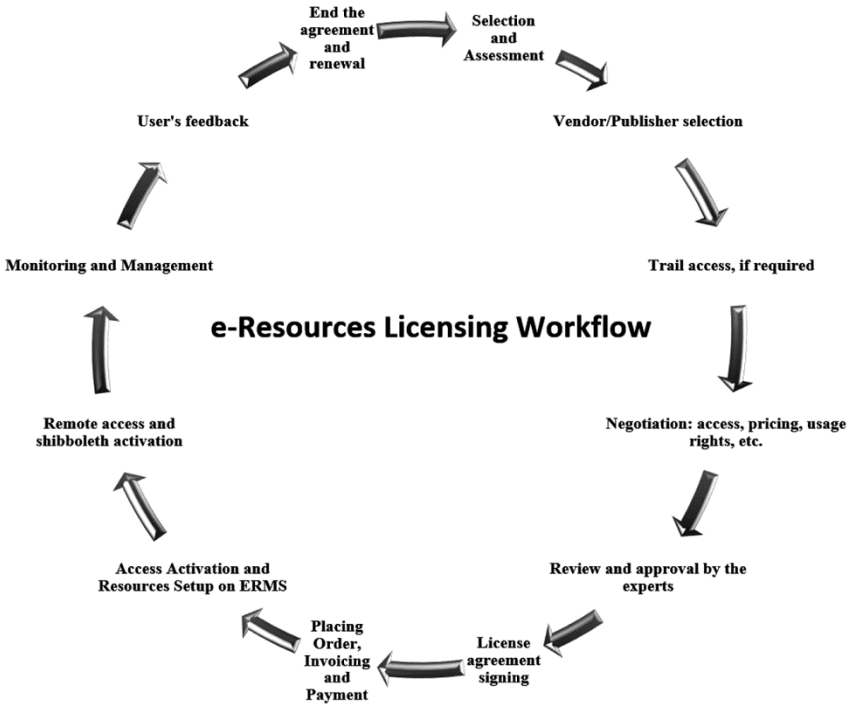

Figure 1 — E-resources licensing workflow

advancements in academic communication, electronic publishing, and copyright legislation and accommodate the realities of modern teaching, learning, and research. JISC provides that the Publisher warrants no liability, sets zero AAU Fee, and can only be amended with the written agreement.

The NISO SERU working group aims to create a best practices alternative for libraries and publishers, avoiding licenses through the "Statements of Common Understandings for Subscribing to Electronic Resources[20]." Model licenses streamline electronic resource purchasing, improve licensing, and reduce costs, but may have drawbacks like inflexibility, unsuitable terms, and lack of maintenance. Model licenses are based on specific regions/states, fulfil the state requirements, and follow the state laws. These model licenses are only suitable for some countries or regions. It requires modification for specific organisations and to particular states as per requirements.

ERMS used in e-resources license workflow management

The present practice of software to manage e-resource license agreement workflows in libraries involves using electronic resource management systems (ERMSs)[21]. These systems are designed to help libraries track and manage electronic resources such as e-journals, e-books, and databases, which have become a major component of library holdings[22]. ERMSs can be standalone software, modules added to an integrated library system, or even a local Microsoft Access database[23]. Implementing ERMSs can help libraries streamline their workflows and improve the management of electronic resources, including license agreements[24]. The development of local licensing guidelines also contributes to consistency in the approach to license review and makes the institution's practice and policy the basis of the licensing review. ERMS significantly saves license negotiations time and works efficiently; it aids librarians in making the right decisions in the e-resources negotiations process.

Software used in e-resources licensing workflows varies based on the library or institution's needs and budget, involving stages and essential tools for managing and optimising processes. Some software commonly used in different stages of the e-resources licensing workflow are-

- License management software: LicenseSpring, License Dashboard, FlexeraFlexNet Manager, Snow License Manager, and SAManage by AssetMetrix.
- Electronic Resource Management Systems (ERMS): Serials Solutions, Ex Libris Primo, EBSCO A-to-Z,

Intota by ProQuest, Innovative Interfaces Sierra, OCLC WorldShare Management Services, ProQuest 360 Resource Manage, and Drupal.

- Knowledge Base Systems: Coral, LibLime, LinkFinder, and CobbleStone Contract Insight.
- Usage Data Analysis Tools: COUNTER, Counter R5, SUSHI, and Google Analytics.
- Budgeting and Procurement: Ex Libris Alma and SirsiDynix Symphony.
- Negotiation and Collaboration: Slack, Microsoft Teams, SharePoint and Google Drive.

In addition to these general categories, there are also several specialised software tools available for specific aspects of e-resources licensing, such as Document Management 'M-Files', Vendor Relationship Management 'Salesforce', Access and Authentication systems 'EZproxy by OCLC', Digital Rights Management (DRM) 'Adobe Digital Editions', OpenURL link resolver 'SFX by Ex Libris', Workflow Automation 'Zoho Creator', Discovery Services 'Summon by ProQuest', Proxy Servers 'WAMProxy by Innovative Interfaces', Federated Identity Management for single sign-on 'Shibboleth', Learning Management Systems (LMS) platforms Canvas, Moo dle, Blackboard, etc.

It's crucial for organisations to carefully choose and integrate these tools based on their specific needs. Libraries can optimise their e-resources investment by combining different software types, ensuring they meet user needs, and keeping their software solutions updated to align with evolving industry standards based on factors like library size and complexity.

However, there are still a few shortcomings that must be acknowledged and resolved, such as the need to customise the software according to the specific requirements of each library, as different libraries have different needs. It can be quite challenging to constantly adapt the format of the electronic resources, access methods, platforms, and user demands and incorporate all of these requirements into a single software system. Interpreting license language, precisely the terms of use, can be challenging, and mapping this language with Electronic Resource Management Systems (ERMS) can be much work. Handling diverse, relevant information, including licenses, contracts, payment details, and access privileges, can be challenging. The administration of electronic resource license agreements is still time-consuming and complex due to its intricacy[25]. Adopting Electronic Resource Management Systems (ERMS) is a cost-effective approach that impacts the financial resources allocated to the library[26]. Proficiency in managing ERMS and implementing it within the library is essential.

A few key benefits of an Electronic Resource Management System (ERMS) are the following:

- Facilitates efficient management of e-resources through evaluation, selection, acquisition, renewal/cancellation, and license agreements.
- Enables access to usage statistics, access rights, and administration.
- ERMS helps libraries and institutions manage electronic resources on time and quickly.
- Helps in negotiation with publishers and vendors and understands licensing terms.
- Enhances ERM practices by providing workflow utilities, information sharing, enhanced record-keeping, and institutional knowledge storage options.
- Improves e-resources workflow, centralises data, and enhances administrative interfaces.

Artificial Intelligence used for e-resources license workflow

AI can significantly enhance the e-resources licensing agreement workflow by automating the review of license agreements, generating custom license agreements tailored to the specific needs of the library and vendor, assisting in negotiation, and monitoring compliance with license agreements. AI can also identify trends and patterns in license agreements, providing insights into their impact on library users and services and developing new and innovative licensing models. This can save libraries time and resources, ensure the best possible terms from their vendors, and improve compliance with license agreements. Furthermore, AI can help libraries make informed decisions about licensing and budgeting and develop new and innovative licensing models. Overall, AI has the potential to improve the e-resources licensing agreement workflow significantly.

While the application of AI in e-resources licensing is still in its early stages, several promising tools are emerging to tackle different aspects of the workflow. Some AI tools that are commonly used in various stages of e-resources licensing workflows are-

- Contract Review and Analysis tools: LegalSifter, Luminance, Docupace AI, Clausehound, LicenseSpring and Kira Systems,

- Data Usage Optimization tools: Thorin.ai, Ex Libris Esploro, Serials Solutions E-Resource Analytics.
- License Negotiation and Optimization: Librariansaurus, Evisort, Cogito, Negotiation Hub.

In addition to these general categories, there are also several specialised AI tools available for specific aspects of e-resources licensing, such as IRUS-UK for Content Usage Analytics, Right Find Navigate by CCC for License Management, Catalyst QM for Vendor Management, File Open Systems for Digital Rights Management, Rosoka for Data Extraction, Compliance Sheriff for Automated Compliance Monitoring, Cortex by SciBite for Renewal Prediction, Zapier for Workflow Automation, EBSCO Discovery Service, ProQuest One Discovery, and SFX Open URL Resolver for Resource Discovery and Recommendation.

A few key benefits of AI tools are the following:

- Reduces contract review and redlining time, increasing efficiency and productivity.
- Identifies problematic terms in contracts, mitigating risks.
- AI tools provide valuable insights into e-resources negotiations.
- Improves collection development, selection of e-resources, and decision-making.
- Transforms the licensing process, making it more streamlined, effective, and cost-efficient.
- AI tools can significantly reduce errors and increase accuracy and precision.
- AI enables the automation of routine monotonous tasks such as user data collection, data entry, usage statistics data, etc.
- It can handle extensive library data smoothly and accurately.
- It may identify and protect the access/security risks from misuse.

The constraints associated with employing artificial intelligence (AI) in the workflow of e-resources license agreements include the requisite for custom configuration to enhance effectiveness by precise requirements. The suitability of AI tools depends on organisational needs and e-resource management, requiring a thorough evaluation of capabilities, compatibility, and security features. AI adoption in e-resources licensing is evolving in ethical implications; data privacy and human oversight are crucial. Ethical concerns surrounding the utilisation of AI within this framework have been raised, prompting the formulation of principles for responsible implementation of AI[27]. Nevertheless, these principles encounter challenges in terms of enforceability, which underscores a prospective limitation in guaranteeing the ethical utilisation of AI systems. No single software solution can address all challenges in managing license compliance, e-resource puzzle for libraries, and additional tools like e-journal management, OpenURL linking, and federated metadata searching, primarily influenced by budgets and local needs[28]. The adoption of AI tools is a cost-effective approach that has an impact on the financial resources allocated to the library. Proficiency in managing AI tools and implementing them within the library is essential.

Discussion

During the era of print media, librarians did not express concern regarding library resource licensing. In these digitally advanced times, license agreements have become more complex due to technological development, the global reach of the digital market, and the increasing complexity of electronic resources. These agreements present issues in defining the scope of the license and guaranteeing equitable conditions because of their adaptation to different legal systems across several nations and their capacity to handle interactive features, multimedia content, and other factors. Negotiating licensing arrangements for electronic resources presents several difficulties, including understanding complex legal jargon, negotiating with well-known publishers with much clout, and keeping up with the latest technological developments. The variables listed above present difficulties for libraries when attempting to achieve ideal circumstances and comply with the terms specified in the contract.

Librarians can resolve issues with e-resources licensing contracts by consulting with specialists, cooperating with publishers, and pushing for copyright legislation and licensing procedures modifications. Before engaging in negotiations with publishers, they should also have a clear idea of what they need, be ready to back out if the terms they are seeking are not met, and routinely review their agreements to make sure they are getting what they paid for and that the terms are being followed. Libraries may ensure their patrons have access to the e-resources they require. Libraries access digital material through license agreements, exceptions, legal

deposit, and the public domain. Digital rights management (DRM) threatens access and hinders it. Institutions are overwhelmed by digital technology's limitations and exceptions, glorifying rights and de-meaning fair use.

Copyright concerns in generative AI include regulation of training methods and data sources. Generative AI systems crawl online content and extract data from public domain or unprotected material. This data is used to create new content, which copyright holders then use to create derivative works. Some argue that these works should be protected as new works and that copyright holders should be compensated for using their work as training data. The challenges in copyright management are multifaceted and require careful consideration.

Many tech companies producing AI-generated programs argue that their training method falls under copyright exceptions, such as Fair Dealing and Fair Use. They believe that training on all available works is crucial for accurate output. Similar to existing work in AI-generated content, it is considered accidental and not infringement. Deep fakes, where AI programs create works involving celebrity voices or images, are a copyright concern. While copyright law cannot protect voices, discussions are underway to develop copyright-adjacent laws to make AI-generated recordings illegal. Emerging applications include blockchain-based licensing platforms, AI-powered chatbots, and predictive analytics for secure, transparent license management and dynamic e-resource access.

AI tools can augment the administration of e-resources license workflows by identifying and resolving the challenges and issues that emerge during this procedure. Still, numerous limitations exist in ERMS and AI tools for integration into e-resources license workflows. Nevertheless, it has substantially advanced the e-resources negotiation process, enabling informed decision-making and significantly reducing the time expended by librarians. AI is a practical and cutting-edge option for drafting contracts. However, managing online contracts requires accuracy, knowledge, and a thorough comprehension of legal and business needs. Even with their technological advancements, AI systems still pose difficulties when drafting these intricate agreements efficiently. By harnessing the power of AI technology, libraries can surmount obstacles associated with the acceptance and supervision of e-resources, ultimately enhancing the efficiency and effectiveness of their workflows.

Conclusion

A flexible and user-friendly license agreement better meets the needs of the libraries and publishers. ERMS and AI tools can help libraries to make decisions about collection development, budgeting and developing an innovative licensing model. The library signs license agreements with different vendors and publishers, setting specific terms and conditions for specific resources. The libraries must inform detailed to users about the license terms and conditions and user responsibility while accessing subscribed e-resources. What is permitted and restricted are not uniform across all resources; agreements do not allow for uploading copyright-protected works to third-party platforms, including generative AI tools. The expert must review a license agreement before finalising the contract. However, wider ERMS and AI contract review software adoption can increase efficiency and accuracy, freeing up resources for critical tasks. AI systems face unique challenges, such as a lack of control and run-time guarantees and no generalisable solutions. Overall, AI has the potential to improve the e-resources licensing agreement workflow significantly. As AI technology continues to develop, more innovative ways to use AI to streamline and optimise the licensing process are expected.

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