INTEGRATED LIBRARY SYSTEM (ILS) SKILLS OF LIBRARIANS FOR ACCESSIBILITY OF RESOURCES

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**Abstract**

*The aim of this research is to assess integrated library skills of librarians for accessibility of resources. An integrated library system (ILS), also known as a library management system (LMS), is an* [*enterprise resource planning*](https://en.wikipedia.org/wiki/Enterprise_resource_planning) *system for a* [*library*](https://en.wikipedia.org/wiki/Library)*, used to track items owned, orders made, bills paid, and patrons who have borrowed.* M*any libraries are in the process of rethinking the effectiveness of the automation tools. They are using to provide library services, both within and outside of their library buildings. Internally, the core component driving many of these services has been the integrated library system (I*L*S).* T*he next generations of these systems are called “library services platforms, a term coined by the consultant* M*arshall Breeding.* *The paper adopted conceptual approach. It determines the concept of ILS, Types of ILS, skills of integrated library systems of librarians, related studies, challenges of ILS, conclusions and recommendations. As libraries have moved increasingly to accommodate digital collections, they have found the ILS products unable to be reconfigured well enough to smoothly and efficiently handle the integration of all the workflows that are different, yet necessary, for both print and digital. In addition, the older ILS do not take advantage of the latest offerings in computing technologies and architectures particularly in the area of cloud computing.* *As technology continues to advance, the field of library and information science is evolving rapidly, and integrated library systems (ILS) of librarians need to keep up with the latest trends and technologies to remain competitive. Some of skills for ILS of librarians are; knowledge of emerging technologies such as artificial intelligence, machine learning, blockchain, big data analytics UX design, project management and digital preservation and curation.*

**Keywords**: *ILS, UX, cloud computing, artificial intelligence, security certification and natural language processing*

**Introduction**

An integrated library system (ILS), also known as a library management system (LMS),is an [enterprise resource planning](https://en.wikipedia.org/wiki/Enterprise_resource_planning) system for a [library](https://en.wikipedia.org/wiki/Library), used to track items owned, orders made, bills paid, and patrons who have borrowed. An ILS is usually made up of a [relational database](https://en.wikipedia.org/wiki/Relational_database), software to interact with that database, and two [graphical user interfaces](https://en.wikipedia.org/wiki/Graphical_user_interface) (one for patrons, one for staff). Most IL Ses separate software functions into discrete programs called modules, each of them integrated with a unified interface. Examples of modules might include: acquisitions (ordering, receiving, and invoicing materials), [cataloging](https://en.wikipedia.org/wiki/Library_catalog) (classifying and indexing materials), circulation (lending materials to patrons and receiving them back), [serials](https://en.wikipedia.org/wiki/Serial_%28literature%29) (tracking magazine, journals, and newspaper holdings), [online public access catalog](https://en.wikipedia.org/wiki/Online_public_access_catalog) or OPAC (public user interface) Each patron and item has a unique ID in the database that allows the ILS to track its activity.

(Rubin, R. E. & Rubin, R. G. 2020)

An Integrated Library System (ILS) gives you access to and manages the resources in your library. It helps users find resources for reading, teaching and learning, as well as managing cataloguing, borrowing and other functions. Libraries have developed into dynamic information hubs that serve the varied demands of their users in the fast-paced digital society we live in today. Libraries are no longer only stores of books and knowledge. They rely on Integrated Library Systems (ILS) to manage the enormous variety of resources, streamline operations, and provide seamless user experiences. (Naha, 2023)

Integrated Library Systems are not new, but the technology that powers them is also not static. Recent decades have borne dramatic advancements in Integrated Library System software and capabilities. These improvements are not one-sided; some have made the lives of librarians and administrators far easier, while others have greatly improved end user experiences. Integrated Library Software (ILS), also known as Library Management System (LMS), is software solutions that help libraries manage their collections; resources and various services. These systems often include modules for technical services, such as acquisition, cataloguing, circulation and more (Lee, 2023). The three common types of integrated library systems include:

**1. On-Premises ILS**

On-Premises ILS is a term used to describe a conventional method in which the system is installed and maintained locally on the library’s servers. The library must manage the hardware infrastructure, software installation, upgrades, and maintenance for this ILS. Libraries have complete control over their data and customization possibilities with On-Premises ILS. To successfully run and support the system, specialized knowledge and resources are needed.

**2. Cloud-Based ILS**

ILS commonly called cloud-based ILS, is hosted and kept up by a third-party provider on their servers. Libraries do not need local server infrastructure because they can access the system using a web browser. Scalability, automatic upgrades, and data backup are all features of cloud-based ILS. It eases the load of managing hardware and software for libraries, allowing them to concentrate on their primary duties. Remote access, improved cooperation, and lower upfront expenditures are all advantages for libraries. For this kind of ILS, dependence on internet access is a factor.

**3. Open Source ILS**

Open Source ILS is free for libraries to use, alter, and distribute and is based on open-source software. It allows libraries customization and flexibility options to suit their requirements. The community frequently leads projects for open source ILS, which promotes cooperation and contributions from libraries worldwide. It requires more deployment, upkeep, and support work than commercial options. (Naha, 2023)

**Types of Integrated Library Systems**

Some of the Integrated Library Systems include:

[**Follett Destiny Library Manager**](https://www.trustradius.com/products/follett-destiny-library-manager/reviews)**:** Follett offers the Destiny suite, including Destiny Library Manager, a library management system which also includes Destiny Analytics collections management and analytics, and Destiny Discover resource search tool. Destiny Resource Manager extends the suite to manage school resources such as textbooks, laptops, and other assets. Destiny Library Manager is a complete library management system that can be accessed from anywhere, 24/7, helping to strengthen the crucial bond between the library, the classroom, and the home. Follett destiny provides librarians to discover interface for students and educators to search and access all your print and digital resources including e-books, audiobooks, and interactive books as well as free and paid subscription databases. Students and teachers can access district resources in follett destiny library manager discover and add them to ant collection. Each collection can include web pages, images, documents, e-books and more. Destiny Library Manager's interface is a little dated. After years and years of use, it just looks old. Functionality is not lost, nor is anything else. Attempts at automating the process to update students from SIS have not gone well. It's easier to enter new students manually. (Follett destiny guide, 2018)

**Koha**: An open-source ILS, Koha is widely used by libraries around the world. Koha was developed in New Zealand for a small branch library and has a 100% Web-based interface for both staff and public. It offers modules for acquisitions, cataloging, circulation, and more. Being open-source, Koha provides a centralized platform for managing all aspects of a library. From book acquisition to circulation, everything can be managed from a single location. As a result, library management becomes easier and errors are less likely to occur libraries can customize and adapt Koha to their specific needs. Koha can be challenging to set up and customize, especially for those who are not familiar with open-source software or the underlying technology. Lack of commercial support: Koha is a community-driven project, so it may not have the same level of commercial support as proprietary systems. Koha may not integrate with other systems, such as discovery layers or digital content management platforms, as easily as other ILSs. As an open-source project, Koha requires regular maintenance and updating, which can be time-consuming and technical in nature. Some users may find the user interface to be less intuitive or user-friendly compared to other ILSs. (Kim, I., 2021)

In addition, Koha is extremely flexible and powerful, allowing you to effectively setup a full features Library website without having to purchase any expensive software. The Koha server supports a robust catalog search feature, powerful user management, relatively easy way to scan in new books, and even the ability to print out barcodes for said books. And with a bit of work, you can customize Koha to display a nice web portal. There is also a robust support community to help librarians out. The Koha backend is extremely dense and non-intuitive. While there is a search feature to find different settings, the settings themselves are labeled in an opaque manner, making it difficult to know what librarians are searching for. Furthermore, any kind of editing users would like to on the web portal must be done using CSS; there is absolutely no WYSIWYG editor of any kind.

 Furthermore, some potential disadvantages of using Koha ILS are; Steep learning curve: Koha can be challenging to set up and customize, especially for those who are not familiar with open-source software or the underlying technology, lack of commercial support: Koha is a community-driven project, so it may not have the same level of commercial support as proprietary systems, limited integration options: Koha may not integrate with other systems, such as discovery layers or digital content management platforms, as easily as other ILSs, maintenance requirements: As an open-source project, Koha requires regular maintenance and updating, which can be time-consuming and technical in nature and user interface: Some users may find the user interface to be less intuitive or user-friendly compared to other ILSs.

(Maiden, A.R., 2017)

**World Share Management Services** (WMS). It was developed by OCLC, in Dublin, Ohio. It is a cloud-based ILS that supports technical services tasks such as acquisitions, cataloging, and circulation. It also offers integration with other OCLC services. OCLC’s WorldShare Management Services provide cloud-based library management and discovery applications in an integrated suite, offering librarians a comprehensive and cost-effective way to manage library workflows efficiently, and improve access to library collections and services. World share management services (WMS) helps in the greater efficiencies in library management, workflows are delivered, no additional costs in having to acquire a discovery tool, build better student experience and focus more resources on innovation, all of users acquisitions functions are available in one system, draw on WorldCat to power users workflows, reduced IT maintenance, meaning more time for strategic IT initiatives, less need to spend time and money on security issues and quick and efficient execution of work, saves time and money. One of the main drawbacks of WorldShare Management Services is that it does not provide comprehensive support for non-MARC formats. This can be a problem for libraries that need to manage and process a wide range of data in different formats. Additionally, the user interface can be somewhat confusing and difficult to navigate, especially for users who are not familiar with the product. Finally, some users have reported that integration with existing business processes can be difficult and time-consuming. (Elizabeth, L. & Denise, I.O, 2018)

**Evergreen**: Another popular open-source ILS is the evergreen ILS. It is known for its scalability and is used by a variety of libraries, especially in consortia. It supports technical services workflows and resource management. Evergreen is maintained by the Georgia Public Library Service (US) and has features that have not yet been completed such as acquisitions and serials. Evergreen is an [open-source](https://en.wikipedia.org/wiki/Open-source_software) [integrated library system](https://en.wikipedia.org/wiki/Integrated_library_system) (ILS), initially developed by the [Georgia Public Library Service](https://en.wikipedia.org/wiki/Georgia_Public_Library_Service) for [Public Information Network for Electronic Services](https://en.wikipedia.org/wiki/Public_Information_Network_for_Electronic_Services) (PINES), a statewide resource-sharing consortium with over 270 member libraries. Beyond PINES, the Evergreen ILS is deployed worldwide in approximately 1,800 libraries, and is used to power a number of statewide consortia catalogs. Development priorities for Evergreen are that it be stable, robust, flexible, secure, and user-friendly. (Charlton, G., 2016)

**Library Solution:** Library. Solution by TLC (The Library Corporation) headquartered in West Virginia offers Library Solution, a hosted library management and automation system for schools, higher and public libraries. It offers a suite of modules for various library functions, including technical services like acquisitions and cataloging.

**Symphony:** Symphony, also developed by Innovative Interfaces, is an ILS that provides modules for acquisitions, cataloging, circulation, and other library operations. It connects patrons and librarians and is designed to serve as the cornerstone of a library. SirsiDynix Symphony is a proven, robust ILS built for now and the next generation in library technology. Used by public, academic, K-12, special libraries and consortia worldwide, Symphony is the most widely installed ILS in history. Symphony ILS is an integrated library system (ILS), also known as a library management system. An ILS is an enterprise resource planning system for a library that is used to track items owned, orders made, bills paid, and users who have borrowed. The Symphony WorkFlows Client is the user interface into the Symphony ILS database and provides functionality for self-service stations and material ordering interfaces. The offline feature mainly serves check-in and check-out tasks. This means that external servers containing vital information are not reached. The weakest point of Symphony System is its reports. The management reports are grossly inadequate and badly formatted. It is a time consuming process and frustrating at times. (Zhonghong, W., 2009)

**Voyager:** Developed by Ex Libris (prior to Alma), voyager is an integrated library solution designed to serve as the backbone of the library service systems. It has a graphical interface, is standards-based, and built on open systems technology. This allows it to interoperate with existing library systems. It offers modules for acquisitions, cataloging, circulation, and more. It's used by many academic and research libraries. Voyager is an [integrated library system](https://en.wikipedia.org/wiki/Integrated_library_system) used by hundreds of [libraries](https://en.wikipedia.org/wiki/Libraries), universities and museums around the world. Voyager was developed by [Endeavor Information Systems](https://en.wikipedia.org/w/index.php?title=Endeavor_Information_Systems&action=edit&redlink=1) Inc., which was merged into [Ex Libris Group](https://en.wikipedia.org/wiki/Ex_Libris_Group) in December 2006. The underlying technology remained relatively similar over the years, with the exception of the [online public access catalog (OPAC)](https://en.wikipedia.org/wiki/Online_public_access_catalog). With Version 7, in 2008, the "Classic" WebVoyage OPAC was replaced in order to counter mounting competition from [Koha](https://en.wikipedia.org/wiki/Koha_%28software%29) and others. (Yang, S. Q., 2010)

**Apollo:** Apollo, developed by biblionix, is designed for smaller public libraries and focuses on simplicity and ease of use. It includes modules for acquisitions and cataloguing. Apollo ILS empowers patrons to access library resources with ease. The software provides state-of-the-art catalog features and allows public libraries to display third-party e-resources at no extra cost. The approach offers more exposure for library resources to the patrons and integrates them into a familiar online shopping experience. The user-friendly interface is also customized to allow patrons to interact with the library resources with ease. (Klein, M., 2013)

 **Integrated Library System Skills of Librarians**

A**s** technology continues to advance, the field of library and information science is evolving rapidly, and integrated library systems (ILS) librarians need to keep up with the latest trends and technologies to remain competitive. Some skills for ILS librarians are; Knowledge of emerging technologies: with the rapid advancement of technology, ILS librarians need to stay up-to date with emerging technologies such as artificial technologies, machine learning, blockchain and big data analytics. Librarians should have a solid understanding of how these technologies can be applied to improve library services (Okpe, I.J., 2013).

 **Data management and analysis**: ILS professionals should have a strong background in data management and analysis to make data-driven decisions. The data management and analysis is used to collect, analyze and interpret data to improve library services and make informed decisions. Data management skills are in high demand by potential employers since they allow users to use available data to support a company's overall objectives. Data management skills are the abilities librarians use to effectively manage and use information. Data management skills involve looking for patterns, understanding database design concepts and being able to participate in short and long-term planning about database projects. It helps to manage data to improve programs, librarians need to be able to examine data and look for patterns to reach some kind of conclusion. This involves being familiar with the data they have access to and identifying creative solutions for how to use it to reach goals. ILS librarians should have strong data management skills and knowledge of Python, PERL, SQL, Java, XML, C/C++ and others (Klein, M. 2013).

**User experience (UX) design**: ILS professionals should have a solid understanding of UX design principles to ensure that library users can easily access and use library resources. A UX designer is one of the most in-demand careers in the creative industry right now. Librarians should understand the fundamental skills a UX designer should have. They should have the ability to design and implement intuitive and user- friendly interfaces that improve the user experience. They should also be proficient in information architecture, wire framing, prototyping and visual communication.

**Digital preservation and Curation**: ILS professionals should have a solid understanding of digital preservation and curation techniques to ensure that digital assets are properly preserved and accessible for future generations. General ILS librarian skills are needed at a high level to provide a deep understanding of the reasons why preservation is required. High-level capabilities, such as project management, presentation skills and advocacy are needed, as well as technical skills. Digital curation involves maintaining, preserving and adding value to digital research data throughout its lifecycle. The active management of research data reduces threats to their long-term research value and mitigates the risk of digital obsolescence.

**Project Management**: ILS professional should have excellent project management skills to successfully manage complex projects such as migrations, upgrades and integrations. They should be able to coordinate and manage teams of professionals and communicate effectively with stake holders. Project management skills are the traits and characteristics that help librarians take winning projects all the way from idea to completion, that includes planning projects, assessing risks and opportunities, creating budgets, communicating with stakeholders, troubleshooting problems, and more (Mcdermott, I.E. 2012)

**Artificial Intelligence:** Artificial Intelligence (AI) technology has been gaining popularity in recent years. From robots serving food in restaurants to [self-driving cars](https://www.simplilearn.com/evolution-of-the-intelligent-car-article), these applications of [artificial intelligence](https://www.simplilearn.com/tutorials/artificial-intelligence-tutorial/what-is-artificial-intelligence) can be seen in our day-to-day lives. Computer science, math, engineering, and other related disciplines are all combined in the interdisciplinary area of artificial intelligence (AI). [Natural language processing](https://www.simplilearn.com/tutorials/artificial-intelligence-tutorial/what-is-natural-language-processing-nlp) (NLP), [image recognition](https://www.simplilearn.com/image-processing-article), robotics, and decision-making algorithms are just a few examples of the many uses for AI. Understanding human language, processing and analyzing text, and producing answers that are believable and natural are all components of NLP.  Programming skills in Python and Java are necessary for NLP, as is familiarity with NLP tools like NLTK and spaCy. Working with a lot of data in AI projects calls for data science abilities. These competencies include data extraction, [data analysis](https://www.simplilearn.com/data-analysis-methods-process-types-article), and [data visualization](https://www.simplilearn.com/data-visualization-article). Data science needs knowledge of programming languages like Python, R, and SQL as well as hands-on experience with tools like Pandas and NumPy. (Breeding, M. 2021)

**Related Studies**

Fu and Fitzgerald (2013) conducted a comparative analysis on how the software
architecture and the workflows/functionality of the traditional ILS and the next-
generation ILS may impact system and technical services staffing models at academic
libraries. They suggested that “redefining staff job descriptions and reorganizing library
organizational structures might be necessary in order to better adapt to the changes
brought about by the next-generation ILS”. Andrew Pace from OCLC emphasized, “Stagnation of ILS development has become obstacles to the library’s services. Libraries require a sea-change, a dramatic departure from the status quo of library automation, solutions that will scale like typical web solutions and technologies that will ensure their future.” (Pace, 2009)

 Another library expert and researcher, Roy Tennant wrote in his personal blog “most integrated library systems, as they are currently configured and used, should be removed from public view. The reasons are most of the systems contain incomplete information due to their inflexibility of dealing with library holdings. The interface is not user-friendly. He even vehemently claims that “the OPAC is dead” as these systems become “thoroughly anachronistic” and have lost their vitality. Others such as Kristin Antelman and Stephen Abram have expressed their concerns to the current situation of ILSs and their predictions of the future systems. [McDermott (2012)](https://www.emerald.com/insight/content/doi/10.1108/LHT-01-2013-0003/full/html?mobileUi=0&fullSc=1&fullSc=1&mbSc=1#b43) advises that some knowledge of SQL is needed to generate reports, but support personnel supplied her with many useful SQL queries.

Furthermore [Macan et al. (2013)](https://www.emerald.com/insight/content/doi/10.1108/LM-05-2017-0052/full/html#ref301) are optimistic, stating that “increased functionalities and better manuals” could mitigate for a lack of dedicated IT staff in libraries, the use of OS ILS requires sufficient technical expertise to perform the installation and migration of data, modify source code in order to customize features and functionalities based on libraries’ needs, ongoing troubleshooting and maintenance ([Bilal, 2014](https://www.emerald.com/insight/content/doi/10.1108/LM-05-2017-0052/full/html#ref005), [Webber & Peters, 2010](https://www.emerald.com/insight/content/doi/10.1108/LM-05-2017-0052/full/html#ref044))

Sahu (2013) explained the skills and competencies of the library professionals regarding use of ILMS packages in libraries. The study found that library professionals should acquire required skills towards library automation for smooth functioning of the ILMS. Fu and Fitzgerald (2013) conducted a comparative analysis on how the software
architecture and the workflows/functionality of the traditional ILS and the next-
generation ILS may impact system and technical services staffing models at academic
libraries. They suggested that “redefining staff job descriptions and reorganizing library
organizational structures might be necessary in order to better adapt to the changes
brought about by the next-generation ILS”. Breeding (2012a) claimed that the next-generation ILS would eliminate many hardware and maintenance investments for libraries.

Breeding (2012a) advocated that the next- generation ILS utilizes Web-scale technology deployed via cloud environment, so vendors can centrally manage the majority of systems tasks that had been performed by local systems staff in a traditional ILS environment.
Sutton (2011) examined the relationship between the knowledge, experience, and skills
expected of systems librarians and the curriculum and support offered to library
students at ALA-accredited programs. Sutton (2011) gathered and analyzed the
contents of online job postings for systems librarians in the previous five years to
determine what employers were looking for when hiring systems librarians. Sutton
(2011) also examined the websites of ALA-accredited institutions to determine what the schools’ curricula, course offerings, and career assistance offered students interested in systems librarianship. Sutton found six of the top 10 most frequently required knowledge and skills were human/organization related. The most frequently mentioned requirement was for communication skills, required in about 70% of jobs

**Challenges of Integrated Library Skills**

 Erratic power supply, low internet bandwidth, inadequate telecommunication infrastructures, lack of funding, lack of adequate training before installation of the software, hardware breakdown, lack of proper feasibility study, lack of technical skills among librarians (installation & customization), technophobia are the major challenges of the usage of integrated library skills.

**Conclusion**Nowadays library automation has become a buzz word in library profession and has become
a bare necessity for any libraries. An automated library can provide better library services to
their users and can maintain the library more properly. The success of any library automation
programs depends upon its awareness, knowledge of library professionals in related to
automated technologies. For that trained manpower is required. Hence library professionals
should be trained properly with requisite knowledge for making the automation program
successful. As the next-generation ILS becomes the norm, librarians will be expected to manage much less in terms of tasks directly related to information technology.

**Recommendation**

There should be steady power supply, superb internet should be provided with adequate telecommunication infrastructures. Funding should also be made available for the purchase of the software’s and hardware’s. Librarians should learn the basics of networking and resource sharing, system configuration, software installation and data inputting. The library must get a well-trained trainer to handle all these, while also recommending a follow up in-house training to any vendor training just to ensure perfection. The libraries using the same ILS should come together to form a software consortium so as share their experiences and developments and also possibly reach out to the copyright owner with a one voice. Furthermore, the libraries should engage more technology savvy or I.T focused librarians in order to ease out most of the technical issues, solves issues within thereby reducing charges incurred on frequent calls for maintenance.

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