Dissemination and Access to Electronic Information in Libraries across the World.

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Abstract
Electronic Transformation of libraries has changed the paradigm of physical possession to Electronic Information Resources (EIRs) and hence there is a global need to evaluate the availability and the use of libraries. This paper examines the degree of EIR availability, usage models and the issues that hinder its use in developed and developing areas. The method of purposive sampling was employed to be able to have a representation of both a developed and the developing continents in order to compare the data, data were obtained based on a systematic literature review and a survey of 150 librarians as well as 200 users (N= 350) in four Continents; America, Europe, Asia and Africa in terms of the number of public, academic and special libraries. The results indicate that there are statistically significant differences in access; 90% of libraries in America and Europe are reporting comprehensive access to proprietary databases however only 40% of African libraries are also reporting appropriate access levels ($X2=45.32$, $p<0.01$). Moreover, EIRs are used by 75% of users in the developed areas, as opposed to 45% in the developing ones (Asia), and Chi-square analysis reveals that there is a strong positive relationship between digital literacy and effective use ($X2=30.15$, $p<0.05$). A lack of infrastructure and lack of funds were pointed out as the most significant obstacles. The results of the study concluded that although EIRs provide a significant improvement in efficiency of research, there is no end to digital divide limiting their effectiveness on a global scale. The suggestions are strategic investment in digital infrastructure, priority of funding to open-access initiatives, and carrying out holistic training programs concerning digital literacy so that the information can be equally available to all.

Keywords: Electronic Resources, Digital libraries, Global Libraries, User Engagement, Digital divide.

Introduction

The advent of digital technology has essentially transformed the operational model and service delivery of libraries in the world. Electronic information the libraries have ceased to be the tangible archives of printed information and evolved into action-packed technology-oriented sources of information. Electronic Information Resources (EIRs), which include e-books, online journals, databases, and electronic archives have become part of library collections in the modern world. They are needed and utilized to provide multidimensional academic, professional, and personal research services to a globalized community (Johnson et al., 2021). This shift entails the need to have immediate access to information and the increasing demand of remote learning, which has been accelerated by the recent global disruptive methods of the traditional approach to education and research.

The trends in the last twenty years have seen more and more libraries incorporating EIRs into collections, which can be attributed to the evolving information-seeking behavior of the consumers. The shift towards the usage of physical resources into digital ones brings along many benefits; among them, there are 24/7 access, searchability, and the possibility to serve multiple remote users at the same time. With a focus on making evidence-based decisions in academic institutions and research organizations, the role of EIRs in the delivery of up-to-date and peer-reviewed literature has been made a priority (Smith and Wong, 2020). As a result, libraries are forced to review their collection development

policies in order to establish the equilibrium between physical heritage conservation and digitization of resources that can satisfy the changing demands of their clients.

Although there seems to be a worldwide trend towards digital resources, there are extensive differences in EIRs access and use, which reflects socio-economic disparities at an overall scale referred to as the digital divide. EIRs have been widely embraced in developed countries, especially in North America and Europe, receiving strong digital infrastructure, large funding, and high technological literacy (Adeyinka et al., 2022). Conversely, libraries in developing countries, such as Africa, parts of South Asia, Latin America, etc. experience systematic challenges. These obstacles are low internet connectivity, insufficient funding models and low digital literacy of the population of users. These disparities do not only limit the functioning ability of the libraries in such areas, but also affect fair accessibility to information and educational achievement within the communities.

Moreover, the EIRs usage is not only a question of availability but also depends on user interaction and value on the resources. Although access is a condition, the efficient use of EIRs presupposes the users to have certain information retrieval and digital navigation skills. According to the research, the very presence of EIRs does not ensure their utilization without the appropriate training and user-friendly interfaces (Ifijeh et al., 2020). Thus, the study of the behavioral characteristics of users in searching, evaluating, and incorporation of electronic information in their job is vital to libraries to warrant the hefty spending that is involved in maintaining these digital collections.

This paper will examine the world scene of EIRs in libraries and will offer a comparative study of various regions. Through consideration of the availability, user interaction, and other related issues, this study aims to bridge the gap in existing literature about the quantitative differences in EIR adoption. The particular research questions that will be used in this study are (1) What is the level of accessibility of Electronic Information Resources to libraries across the globe? (2) What are the ways that users interact with EIRs, and what determines their use? (3) What are the barriers and opportunities to the implementation of EIRs in libraries around the world? The results of the study will offer essential information to policy makers, library administrators and funding institutions where there is a necessity of closing the digital information gap.

Reviewed Literature

Development and History of Electronic Information Resources.

Electronic Information Resources (EIRs) is a concept that first appeared in the late 20th century, right at the onset of the internet as well as the digitization of publishing. Libraries started with a very small number of digital solutions online in the content of CD-ROM databases, which could be indexed and abstracted but had to be physically present. The fast growth of the World Wide Web and cloud computing technologies, however, has since increased the range of EIRs exponentially to open-access journals, institutional repositories, e-books and streaming media. In the present context, EIRs are defined by their immediacy and interactivity, and the opportunity to be constantly updated, which makes the difference between them and print media that remain static (Chaudhry, 2020). The change has made libraries become more of gateways to information than a warehouse of books and different competencies are required in information professionals.

According to scholars, this is not only a technological but also an epistemological evolution which has altered the mode of the creation and propagation of knowledge. The transition to the digital environment has democratized access to information to a certain degree, enabling access to resources at the same time to a variety of users irrespective of geographical location (Tella et al., 2021). Nonetheless, the shift has also come with the complexities with respect to digital preservation, copyright control, and the sustainability of the licensing models. With the evolving use of artificial intelligence and semantic web technologies in EIRs, they are turning out to be a necessity in the modern research and international collaboration.

International Accessibility and the Digital Divide.

The extent of EIRs differs greatly by geographical area, and it is largely dependent on economic development and technological infrastructure. Libraries in developed nations frequently subscribe to large proprietary online collections, such as expensive databases such as JSTOR, ScienceDirect and ProQuest. They are supported by connections to high-speed internet connectivity, substantial institutional investment, and strategic alliances with big publishers. Research has

shown that in such areas, EIRs have ceased to be a side-by-side feature and have become an inherent part of library business and research processes, integrated into the curriculum and research process (Ogbuiyi & Holmner, 2021).

A completely different situation is encountered in libraries in developing regions. Most libraries are overly dependent on open-access materials and international programs like the Research4Life program that offers free or reduced-cost access to scientific literature due to their prohibitive subscription fees and restricted foreign exchange rates (Maweu, 2021). These interventions notwithstanding, the bandwidth needed to access the large multimedia files or to download large datasets of data is still a huge challenge in rural and under-funded institutions. This gap reveals an unresolved digital divide, as it exists between information and information-poor countries, and it affects the quality of research and education in the Global South.

Patterns of User Engagement and Use.

Research has shown that EIRs can greatly improve the engagement of the users as they offer 24/7 access to information, facilitate collaborative research and can offer a personalized learning experience. Accessibility to library materials remotely has been cited as one of the key factors that have led to the shift toward EIRs rather than print materials, especially among the so-called digital native generation of students and researchers (Ossai-Onah, 2022). The frequency of use is however usually associated with the level of the user as postgraduates and faculty members have higher rates of engagement than the undergraduates.

Nevertheless, EIRs are only effective depending on the proficiency of the user. It has been found out that even though internet usage may be frequent, users are usually not well equipped in the area of information literacy as to be able to use unconcerned databases and uncover the reliability of the sources. There are barriers to efficient use of EIRs, like the so-called information overload and search anxiety. Therefore, the feasibility of user-friendly interfaces and user support response services are instrumental in the success of the digital library implementations. Search strategy and citation management training programs are, thus, essential to using these resources as much as possible (Popoola, 2020).

Challenges in Adopting EIRs

In spite of their evident advantages, the implementation of EIRs is full of obstacles. First in this list is the digital divide that includes the differences in internet access, availability of hardware and technological infrastructure. Incidences of intermittent power and poor bandwidth in most of the developing areas make the use of EIRs unreliable, frustrating both the user and the librarian (Nwezeh, 2021). Moreover, the expensive nature of subscription to high-end proprietary databases places a financial burden on the library budgets, in many cases resulting in print subscriptions being cancelled due to lack of the funds to continue with extensive digital coverage.

Furthermore, there is the challenge of copyright and licensing deals which are a major legal and operating challenge. The limitations on remote access or inter-library loan of digital content by restrictive licensing terms are frequent, and they limit the flexibility of the libraries to serve their users. The other bottleneck is the user literacy, where digital skills between patrons and library staff make costly digital collections to be underutilized (Ezema & Ugwuanyi, 2022). And lastly, technology changes fast, so any library has to continuously update, it needs to keep staff in training to keep the library relevant, such speed and agility demand resources that many institutions do not have.

Methodology

The research design adopted in this study is a mixed-method research design which incorporates both qualitative and quantitative research designs because it aims at giving a holistic analysis of the availability and utilization of EIRs in libraries across the globe. The triangulation will contribute to a more solid interpretation of the statistical trends and the experience of librarians and users in the context. Two main sources of data collection were utilized: a systematic review of the current peer-reviewed literature, reports, and case-studies that were published in 2010-2023 and a primary survey as a collection of direct information about EIR adoption and challenges.

A structured questionnaire was used in the survey and the respondents were 150 librarians and 200 library users (N=350) who belonged to various geographical locations. The selected respondents were sampled in four strategic continents; America (North and Latin), Europe, Asia and Africa in terms of the number of public, academic and special libraries.

The method of purposive sampling was employed to be able to have a representation of both a developed and the developing continents in order to compare the data. The questionnaire was divided into Likert-scale questions (under the grading scale of strongly disagree to strongly agree) to evaluate the perceptions of EIR availability, usability, and impact and open-ended questions to receive qualitative feedback on the specific challenges.

The Statistical Package of the Social Sciences (SPSS) was used to analyze the data. The demographic data and general trends in terms of EIR availability were summarized using descriptive statistics, frequency distributions and percentage analysis. The Chi-square test of independence was used to test the relations between variables like the regional development and EIR availability, or digital literacy and utilization. A pilot study was conducted on a sample of 30 respondents to test the reliability and validity of the research instruments. The item alpha of the survey was determined as 0.85, which can be considered a high internal consistency and reliability of the measuring scale.

Results & Findings

Availability of EIRs

The results of the survey show that the availability of Electronic Information Resources differs greatly among regions, which proves the existence of the hypothesized digital divide. In the survey of 90% of the libraries in North America and Europe, there was a wide access to proprietary databases, e-journals, and e-books. Such institutions usually have large budgets and consortium contracts that make access extensive. Conversely, libraries in Asia and Latin America showed moderate access with 65% of them stating their dependence on both open-access resources and limited subscriptions. The strongest result was obtained in Africa where only 40% of libraries said they had sufficient access to EIRs. Lack of funding of subscriptions and low telecommunications infrastructure was often mentioned by the respondents of this area as the major impediments, which compelled them to use inconsistent donations or printed materials.

Patterns of User Engagement and Utilization.

User engagement indicators showed that there were specific trends that were associated with regional development and availability of resources. Users in developed countries (75%) claimed to use EIRs on a daily or few times a week basis, becoming part of their academic life. On the other hand, users in developing regions reported the similar frequency only 45% and usually because of access limitations. In the intent to use, academic research turned out to be the most popular with 80% of the participants stating that they needed it, with professional development coming next with 60%. Most importantly, 85% of all the respondents affirmed that EIRs enhanced their research productivity and results indicating that the effects are overwhelmingly good in those locations where it is accessible. This implies that it is not the utility of the resources that is preventing them but the capability to utilize the resources on a regular basis.

Challenges Identified

The participants were requested to rank the difficulties they are encountering in the access and use of EIRs. The greatest need in the developing regions was the lack of infrastructure, 70% of the librarians referred to the lack of internet connectivity as a key hindrance. Next came funding problems with 65% of the librarians citing lack of funds to subscribe to high end EIRs or renew licenses. Also, the problem of human capacity could be observed; half of users stated that they needed to be trained on digital literacy and further skills in resource navigation as without the necessary skills to use the technology, access alone is not enough.

Statistical Analysis Chi-square tests were used to testing the relationships between key variables. To begin with, it was discovered that the correlation between the regional development and the availability of EIRs was statistically significant ($X2=45.32$, $df=4$, $p<0.01$). This indicates that the economic status in the geographical regions of a library is extremely instrumental in determining whether a library has sufficient EIRs. Secondly, the digital literacy levels of the users and the frequency of EIR usage were significantly correlated ($X2=30.15$, $df=2$, $p<0.05$). Individuals who reported a higher level of self-reported digital literacy were more likely to use EIRs effectively as compared to those with lower levels of digital literacy.

Data Presentation and Analysis.

Table 1: Distribution of Availability and Funding of EIR Regionally.

Region	High Availability (%)	Moderate Availability (%)	Low Availability (%)	Adequate Funding (%)
North America	85%	10%	5%	90%
Europe	82%	15%	3%	88%
Asia	30%	50%	20%	45%
Africa	10%	30%	60%	25%
Latin America	25%	45%	30%	40%
Average	**46.4%**	**30%**	**23.6%**	**57.6%**

Table 1 provides a dramatic difference in EIR availability between the Global North and the Global South. Availability is high in North America (85% and Europe 82%) and this is strongly correlated to the fact that the two regions have a high rate of sufficient funding (90% and 88%) as well. On the other hand, most of the libraries in Africa (60% of all libraries) have poor availability, a fact that is consistent with only a quarter of them having sufficient funds. The middle ground is Asia and America, in which the most common type of availability is moderate. This evidence statistically proves that financial capital is one of the main factors of digital resource equity.

Figure 1: EIR Usage frequency by User Category (N= 200)

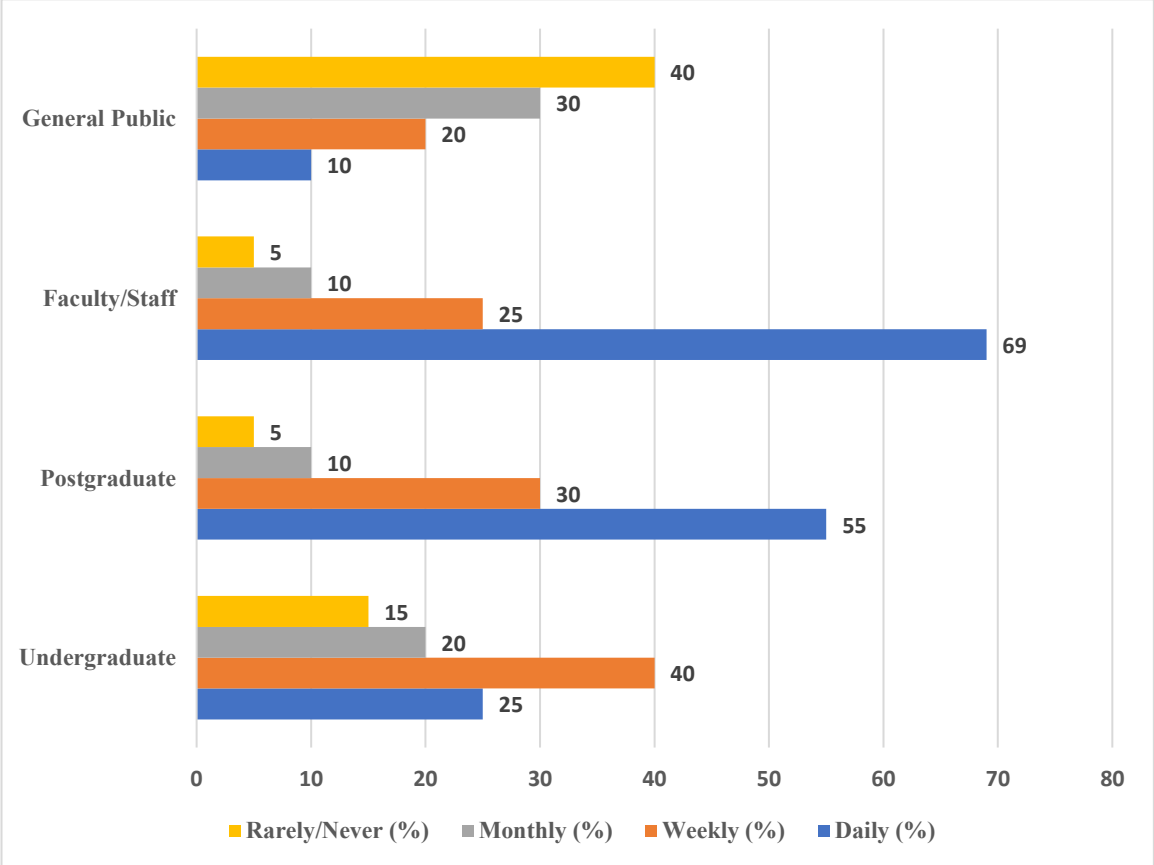


Figure 1 shows the usage pattern among the various demographics of user. The most common users are postgraduate students and faculty members with 55% and 60% respectively of users of EIRs on a daily basis. This implies that digital resources are much needed in advanced research and writing of academic papers. The rate of daily use is lower in undergraduates (25%), perhaps because of the use of textbooks or lecture notes. The least active population is the general population with only 40% using EIRs rarely or not at all and this indicates that there is a gap in the services provided by the public libraries to the non-academic population or the general population is not aware of the existing digital tools.

Table 2: The Influence of EIRs on the Research Results.

Impact Statement	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)
EIRs improve the speed of my research.	65%	25%	5%	5%
EIRs provide access to the most current information.	70%	20%	7%	3%
EIRs are easier to search than print materials.	50%	30%	10%	10%
EIRs have improved the quality of my academic work.	60%	25%	10%	5%

Table 2 contains the data that represents the perception of the user of the value obtained using EIRs. The currency of information has received a unanimous decision as only 90% of the respondents (Strongly Agree and Agree combined) agreed that EIRs contained the most up-to-date information, which is critical over print collections. Moreover, 90% also said that EIRs also increase the speed of research. A narrow margin (85%) also agreed that EIRs positively influenced the academic work of theirs. This shows that although the users value the effectiveness of EIRs, they might still find some value in the traditional processes, or they experience that digital information quality is different.

Table 3: The obstacles to EIR Usage According to Librarians (N=150)

Barrier	Significant Challenge (%)	Moderate Challenge (%)	Minor Challenge (%)
Internet Bandwidth	70%	20%	10%
Subscription Costs	65%	25%	10%
User Digital Literacy	50%	30%	20%
Technical Support	40%	35%	25%
Licensing Restrictions	55%	30%	15%

Both infrastructural and financial barriers were detected by librarians as the most significant challenges. The internet bandwidth was mentioned by 70% of the librarians as a major challenge, especially in the developing areas where internet connectivity is unreliable. Subscribing fee was next at 65%. It is worth noting that the issue of user digital literacy is regarded by half of the respondents as one of the critical ones, which supports the notion that access without training is not a full solution. Licensing restrictions are also a significant obstacle (55%), and they restrict the possibility of libraries to exchange and handle the content.

Discussion

The results of the current research highlight the transformational nature of the Electronic Information Resources (EIRs) in the modernization of library services and the distribution of knowledge throughout the world. They however also remarkably illuminate that digital divide is a critical obstacle to equitable access. The statistical data that demonstrated a strong connection between the regional development and availability of EIR ($X2=45.32$, $p<0.01$) supports the points made by the recent researchers that suggest the economic power determines the access to information. Established libraries in developed countries have managed to implement EIRs as an integral part of their services providing a digital experience to a user. On the other hand, developing country libraries are grappling with structural shortages. With these infrastructural gaps, as observed by Ifijeh et al. (2020), the objective of equitable access to knowledge across the world will still be a mirage.

This difference in the frequency of usage between developed and developing areas is a cause of concern. The results that indicate that 75% of the users in the developed areas use EIRs every day compared with 45% in the developing areas indicate that information practices are being bifurcated along geographical boundaries. This deviation has its consequences in the standard of research product and in the readiness of graduates to work in a global workforce. Maweu (2021) argues that students in developing countries cannot access the latest digital literature, which means that their research will not be as comprehensive and in-depth as possible to compete on a global level. This work proves the fact that the main force of usage is access; in case of quality and reliable resources, the user is eager to use them.

Also, this study indicates that user engagement can be closely connected with digital literacy. The Chi-square value of the relationship between digital literacy and effective use ($X2=30.15$, $p<0.05$) is helpful to put across the idea which suggests that access is a prerequisite, although not sufficient, to use. The users are required to be competent in complex database navigation. The result of 50% of librarians mentioning user literacy as a challenge is consistent with the calculations of Popoola (2020), who believes that the information literacy training must be an obligatory part of the educational course. The libraries would remain unclassified in terms of their potential to achieve when the digital collections, which are expensive, are not trained, and the investment made during the training would be reduced.

The issue of financial constraints was seen as a widespread motif in this research, especially when it came to the sustainability of subscriptions. The high prohibitive prices of proprietary databases set a situation in which only the rich institutions will afford the high-quality resources. This confirms the issues that have been expressed by Ogbuiyi and Holmner (2021) about the commodification of knowledge. The use of open-access projects in third-world countries, though beneficial, is usually not an alternative to more balanced, edited owned collections. The information indicates that two out of every three librarians consider funding a significant challenge. This necessitates reconsideration of existing models of publication and more substantiation of open-access models so that the information is democratized better.

Lastly, the bottlenecks that still exist are the infrastructural barriers, namely, the internet bandwidth. The 70% of respondent librarians in developing areas stating the internet connection as a significant problem is also in line with the results of Ezema and Ugwuanyi (2022). Poor connectivity negates the utility of a subscription even in the event that a library can afford a subscription. This infrastructure gap is not only between the library walls and the environment of the users, but also specifically in remote learning, in the homes of the users. Thus, policy suggestions are not just to be limited to the library sector but national telecommunications infrastructure development should also be mentioned. The challenge suggests that a multi-stakeholder solution to the problems will be necessary where governments, telecommunication companies, and international bodies must collaborate to make the digital library ecosystem inclusive and resilient.

Conclusion and Recommendations

The Electronic Information Resources (EIRs) have become an inseparable part of the work of the contemporary libraries, providing access to information in a way never been seen before, and contributing to the research and schooling process worldwide. This paper has established that although EIRs are effective in helping researchers to improve their efficiency and results, the current digital divide limits the extent of their potential. Inequality in infrastructure, financing, and digital access results in a hierarchical system of access, which benefits those areas that are well developed. The statistical evidence has the validity that geographical area and literacy rates are influential predictors of the use of EIR. To achieve maximum advantages of EIRs and create a more open global knowledge society, united efforts are necessary of all parties involved.

According to the results, the next recommendations can be offered:

Invest in Digital Infrastructure: Governments and institutions should focus on the investments in high-speed internet connectivity and digital technologies that are reliable and dependable, especially in less-developed areas. In the absence of the underlying infrastructure, entry to digital resources is still a theoretical concept.

Expand and Enlarge Funding: Libraries, particularly those in the Global South, need permanent funds in order to subscribe to high quality resources. This may involve government grants or international aid or consortium licensing models to share the costs with the institutions.

Strengthen User Training Programs: Libraries have to introduce regular, mandatory training programs in order to enhance the digital literacy and information retrieval skills of the users. Such skills can be injected in educational programs to guarantee skills in the long term.

Facilitate Open Access Proceeds: Open access journals and institutional repositories can be encouraged to help lessen the use of costly proprietary databases. The libraries are encouraged to promote and engage in open-access movement.

Create Strategic Collaborations: Libraries are advised to have strategic collaborations with publishers, academic institutions as well as foreign organizations to negotiate superior licensing terms and share resources, which will save them personal expenses.

Establish Effective Policy Systems: National and international policies should be in place to deal with copyrights, licensing, and equity so that there is fair access to EIRs. The digital divide should be bridged by formulation of policies that will not widen it with the aid of controlling licensing laws.

With this, the libraries across the globe can take a step towards a more balanced future where the electronic information resources will act as an instrument of knowledge and development, and not an obstacle.

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