

Digital Information and Library Services in ODDE

Towards a Collaborative Digital Library Model

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Abstract

This chapter is anchored on *Collaboration* being a new construct in the Digital Library Reference Model proposed by the DELOS Network of Excellence on Digital Libraries. The chapter argues that distance learning library services will be significantly enhanced with a collaboratively implemented digital library service taking into cognizance the role of collaboration in strategic planning and policy development, provision of digital collections and information services, and technological infrastructure and skills development in the distance education context. The study concludes that the collaborative model for implementing digital libraries in open, distance, and digital education (ODDE) can ensure that digital libraries are collaboratively designed leading to wider acceptance and use in ODDE.

Keywords

Collaboration · Collaboration model · Digital Library Reference Model · Digital libraries · Distance learning library services · Embedded library model

Introduction

Reference Models have been appropriated to support the development and implementation of user-centred digital libraries (Candela et al., 2007). For instance, the Digital Library Reference Model, the brainchild of the DELOS Network of Excellence on Digital Libraries, supports the development and implementation of collaborative learning models such as open education and other post-distance education models (Tammaro, Ciancio, De Rosa, Pantò, & Nascimbeni, 2017). Digital libraries facilitate collaboration in these types of learning in two ways: as learning objects integrated into open educational delivery platforms and virtual learning environment platforms serving as qualified educational infrastructure in their own right (Owusu-Ansah, Rodrigues, & van der Walt, 2019; Tammaro et al., 2017). These pathways to collaboration, notwithstanding, there remains a chasm between digital library teams at the organisational level and the distance education community (Courtney & Wilhoite-Mathews, 2015; Zhang, Liu, & Mathews, 2015). This results in the need for more suitable models for integrating digital libraries into open, distance education, and digital education (ODDE) (Owusu-Ansah et al., 2019).

This chapter explores the potential of the Digital Library Reference Model for developing a collaborative model for integrating digital libraries. According to Candela et al. (2007), the Reference Model provides the framework for developing all the components of an educational digital library. These components are as follows:

1. The appropriate policies to guide the implementation of the digital library
2. A definition of digital library users and their rights and responsibilities

3. The nature of the digital collections and services
4. The acquisition of the right ICT resources to enable the digital library and ensure access to it

The Digital Library Reference Model (Candela et al., 2007) is one of the most useful frameworks for the development and implementation of digital libraries to support practice in several professional fields including the digital humanities (Zhang et al., 2015). The model is aimed at providing a simplified theoretical foundation for the development and implementation of complex systems (Candela et al., 2007). As a reference model, it embodies “a minimal set of unifying concepts, axioms and relationships within a particular problem domain, and is independent of specific standards, technologies, implementations, or other concrete details” (Candela et al., 2007, p. 25). Proposed by the DELOS Network of Excellence on Digital Libraries, the Model is part of the Digital Library Manifesto, and it is expected to bridge the gap existing within current theoretical approaches and ensure a “common basis for communication within the digital library community, and to help focus further advancement” (Candela et al., 2007, p. 25).

Although other models such as the 5S framework by Fox, Gonçalves, and Shen (2012) and Soergel’s Framework for Digital Library Research (Soergel, 2002) and other models of digital libraries were considered equally relevant in developing educational digital libraries, the Digital Library Reference Model was seen as more appropriate for this chapter due to its relative comprehensiveness and practical orientation. For instance, Soergel (2002) conceptualized that for digital libraries to be sustainable and be useful, digital libraries must support professional practice such as teacher education or medicine; provide innovative methods of intellectual work; and enhance collaboration in professional communities. He represents these ideas in 11 themes insisting that digital library researchers address all the concerns raised therein. Soergel’s Model represents a comprehensive research vision for the development of digital libraries. A basic practice-oriented framework in the form of the Digital Library Reference Model, however, was considered more appropriate for this handbook.

According to Owusu-Ansah (2020), conceptions of digital libraries have evolved over the years from a content-centered system that supports specific information provision to one that “delivers innovative, evolving, and personalised services to users” (p. 237). This has led to the development of a new definition for digital libraries as “a virtual organisation that comprehensively collects, manages, and preserves for the long-term rich digital content, and offers to its user communities specialised functionality on that content, of measurable quality and according to codified policies” (Candela et al., 2007, p. 157).

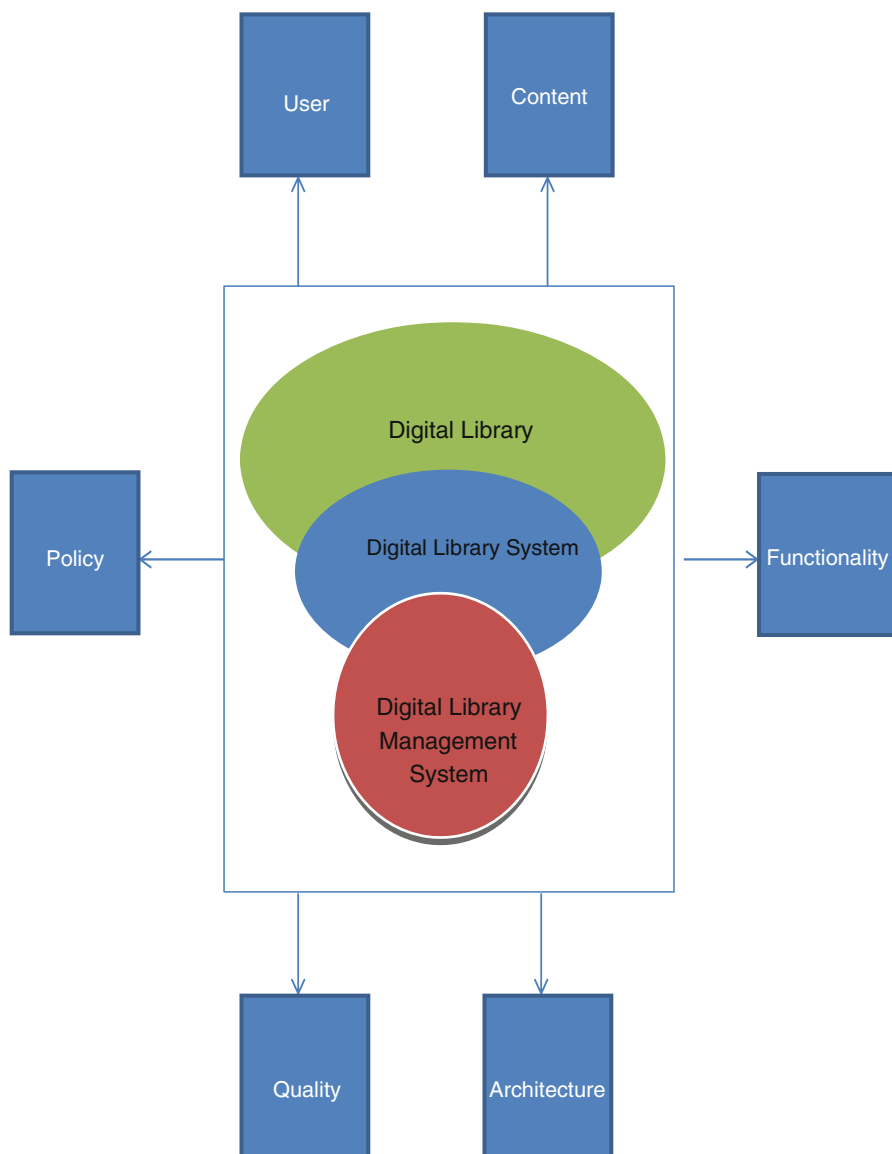


Fig. 1 DL, DLS, and DLMS: a three-tier construct with six DL concepts. (Source: Werla & Mazurek, 2011, p. 2)

Background of the Digital Library Reference Model

The Model (Fig. 1) describes the digital library as a three-tier construct with each representing three notions of conceptions in the digital library universe (Candela et al., 2007). The most important component is the digital library management system (DLMS), which may often be proprietary or commercial product (or set of components), a generic piece of software providing basic functionality required by the particular digital library (Werla & Mazurek, 2011). The second tier is the digital library system (DLS) which enriches the digital library management system with the specific functionality and/or configuration required by the digital library (Werla & Mazurek, 2011). Lastly, the third layer is the digital library (DL) consisting of the organization (institution) collecting and preserving digital content and providing access to it.

Composition of the Digital Library System

The digital library system is composed of six core elements, namely, user, content, policy, functionality, architecture, and quality (Candela et al., 2007). All these concepts, according to the authors, impact the performance of digital libraries. These components are basic to every digital library and are explained further in the next sections.

User

Candela et al. (2007) refer to users as actors that interact with the digital library. These actors may be human or machine agents. Users include the end-users, who further comprise information creators, consumers, and librarians; the designers who use the knowledge to define, customize, and maintain the digital library for functionality to immediate and potential users; the administrators who determine the software needed to construct the digital library based on the end-users' expectations; and the application developers who develop the software needed to ensure appropriate digital library deployment (Anunobi & Ezeani, 2011). In ODDE, users consist of distance learners, their instructors, educational administrators, and librarians. All of these groups of users play critical roles in the distance education field and may exploit digital library services to support teaching and learning through effective collaboration (Tammamaro et al., 2017; Zhang et al., 2015).

User is also a notion for the rights of these actors while exploring the digital library. In ODDE, the rights of users while accessing the digital library include the provision of remote access to digital collections, a right that may be secured through the implementation of favorable user policies for distance learners (Calhoun, 2014, p. 127). Furthermore, it may also include the profile of users as individuals or as a group. The profile of distance learners may be seen in the context of the digital divide in terms of access to relevant technologies, information literacy, and technology

skills (Courtney & Wilhoite-Mathews, 2015). To meet the dynamic information needs of ODDE students (Oladokun, 2014), it is important to understand their ICT and information competencies as this is a requirement for effective utilization of digital resources for academic purposes (Liebenberg, Chetty & Prinsloo, 2012). Furthermore, Owusu-Ansah, Rodrigues, and Van Der Walt (2018a, 2021) advocated for the development of appropriate user policies and rights and deliberate instructional practices favorable to distance education to assure the knowledge, skills, and positive attitudes in and towards digital libraries.

Content

The content constitutes manipulated data and information that is made available to users, and these include primary objects, annotations, and metadata (Candela et al., 2007). Furthermore, Witten et al. (2010, p. 39) describe the content in terms of the document format, and these may include texts, multimedia, or image. According to Candela et al. (2007), content is an umbrella term for all sorts of information objects that are found, managed, and supplied by digital libraries. According to the Association of College and Research Libraries (ACRL) Standards for Distance Learning Library Services (2008), resources for distance education should, among others:

- Meet all students' needs in fulfilling course assignments
- Enrich the academic programs
- Meet teaching and research needs
- Support curricular needs
- Facilitate the acquisition of lifelong learning skills
- Accommodate students with varying levels of technological access (i.e., low bandwidth)

Consequently, digital library collections for distance learners must be capable of supporting these goals in ODDE.

Policies

These consist of the conditions, rules, terms, and regulations governing the digital library and its users (Candela et al., 2007). Policies guide how digital libraries will be used and how their applications will evolve, and these may include content guidelines, access policies, and preservation policies (Riddle, 2015). Policies are designed by people such as digital library managers, managers, and stakeholders (Innocenti, Vullo & Ross, 2010). Gallagher, McMenemy, and Poulter (2015) emphasized the need to inform users of acceptable or non-acceptable behavior while using the public digital library facilities. Instances of specific policies include acceptable user behavior (Robinson, 2019), digital rights management (Mwanzu, 2021), privacy and confidentiality (Avuglah, Owusu-Ansah, Tachie-Donkor, & Yeboah, 2021), charges

to users (Rousmaniere, Ciarkowski, & Guild, 2020), and collection delivery (Candela et al., 2007). In ODDE institutions and their libraries, policies originate from the institutional strategic plan (Owusu-Ansah et al., 2018a). In this chapter, therefore, policies are discussed as components to be factored into a strategic plan. The ACRL Standards (2008) espouse the development of strategic plans for the provision of distance learning library services. This must be an iterative process that includes evaluation, updating, and refinement. Furthermore, strategic planning for any distance learning library service such as a digital library must be factored into the library-wide mission statement and goals and in consonance with that of the institution (ACRL, 2008).

Functionality

The functionality concept refers to the services offered by the digital library to its users. According to Candela et al. (2007), the most common of these services include registration of new information objects, search, and browse. Anunobi and Ezeani (2011) note that these services support the management of the collections, provide replication and reliable storage, aid in query formation and execution, and help in name resolution and location. The functions of the digital library must reflect the particular needs of the digital library community and/or the specific requirements relating to the information resources it contains (Candela et al., 2007). For distance learners, the provision of discovery systems that enable seamless access to distributed information sources is very critical (Calhoun, 2014, pp. 66–67). Again to enhance access and use of digital content and services, distance learners must be provided with a wide range of informational, instructional, and user services in the form of digital reference services (ACRL, 2008). Also, the integration of open access models of digital library resources can considerably enhance the functionality of digital libraries in respect to the discoverability, interoperability, and usability of digital content, resources, and services (Liebenberg, Chetty, & Prinsloo, 2012; Toledo, 2017).

Architecture

The architecture involves the enabling technology which ensures that the services and content offered by the digital library are well integrated into hardware and software components (Anunobi & Ezeani, 2011). According to Candela et al. (2007), the architecture component provides a clear framework with which to address the issue of complexity in digital libraries and interoperability across different digital library systems. To enhance the acceptability of digital libraries, they must be accessible, and the architecture component makes this possible. Distance learners require access to ICT as an enabler. Academic libraries must, therefore, provide the relevant technological infrastructure to facilitate access to online and digital resources for distance learners (Maddison, 2013). In distance

education, enabling technologies for digital library services include computers and networking facilities, assistive technology, and remote access technology, among others (Omotayo & Haliru, 2020).

Quality

This concept represents the platform for determining the characteristics and for evaluating the content and behavior of the digital library (Anunobi & Ezeani, 2011). Quality consists of parameters that can be used in measuring not just the content but also the specific information of objects or services associated with them (Candela et al., 2007). According to Soergel (2002), evaluation of digital library quality may be completed with either a qualitative or quantitative approach. Objective measures may be evaluated for quality using quantitative methods, whereas subjective parameters are better evaluated with qualitative approaches. Several authors such as Saracevic (2000), however, report that evaluation of digital library services has been lacking in practice due to factors such as the complexity of digital libraries, lack of comprehensive knowledge of the nature of digital libraries, low level of interest among digital library developers for evaluation of their services, and lack of funding for evaluation activities, among others. The situation has improved over the past decade with numerous studies reporting successful evaluation of digital libraries (Alzahrani, Mahmud, Ramayah, Alfarraj, & Alalwan, 2019; Heradio, Fernández-Amorós, Cabrerizo, & Herrera-Viedma, 2012; Shen, Gonçalves, & Fox, 2013; Xie, Joo, & Matusiak, 2018), albeit on the user perspective. Alzahrani, Mahmud, Ramayah, Alfarraj, and Alalwan (2019) examined the critical success factors of digital libraries using the DeLone and McLean (2003) information system success model. Two dimensions of digital library quality were identified, namely, system and information quality. The system quality dimensions in their study referred to the extent to which a digital library was “user-friendly” and remained responsive and useful without difficulties to the user. On the other hand, information quality involves a user’s perspective of the value of a digital library. The dimensions of information quality include timeliness, the accuracy of content, completeness, relevance, and consistency of the digital library service. Furthermore, Xu and Du (2018) alluded to service quality as being responsible primarily for user satisfaction. In the same vein, user satisfaction results in further use of the digital library system (Alzahrani et al., 2019). Xie, Joo, and Matusiak (2018) examined a set of evaluation criteria of digital libraries from the perspective of academic stakeholders. The ten dimensions of quality were collections, information organization, interface design, system and technology, effects on users, services, preservation, administration, user engagement, and context. Despite the crucial role of evaluation in digital library projects, they are often not factored into the digital library development cycle (Chowdhury, 2016). Xie et al. (2018) noted the critical place of evaluation in digital library implementation pointing out that evaluation involves “the process of determining merit, worth or valuation of [the digital library], or the product of that process” (p. 854). It does appear, however, that evaluations of digital libraries

focus more on the user perspective rather than the detriment of developers' perspective (Rahimi, Soleymani, Hashemian, Hashemian, & Daei, 2018).

Other Actors in the Digital Library Universe

In addition to the core concepts discussed above, Candela et al. (2007) describe the roles of four main actors within the digital library universe who variously interact with the three-tier framework and the core concepts. These are digital library end-users, digital library designers, digital library system administrators, and digital library application developers.

Digital library end-users are the ultimate clients of the digital library as they exploit the digital library functionality for providing, using, and managing the digital library content as well as some of its other constituents. The digital library is a full entity that serves the functional needs of end-users. Furthermore, digital library end-users comprise content creators, content consumers, and librarians.

Digital library designers comprise the organizers and initiators of the digital library from the application point of view. They exploit their knowledge of the application semantic domain to define, customize, and maintain the digital library so that it is aligned with the information and functional needs of its end-users. To perform this task, they interact with the digital library management system to provide functional and content configuration parameters.

Digital library system administrators, on the other hand, ensure the successful implementation of the digital library from the physical point of view. They select the software components necessary to create the digital library system needed to serve the required digital library and decide where and how to deploy them. They interact with the digital library management system by providing architectural configuration parameters, such as the selected software components, the hosting nodes, and the allocation of the components.

Digital library application developers are the implementers of the software parts needed to realize the digital library. They develop the software components of the digital library management system and digital library system, to achieve the necessary functionality (Candela et al., 2007).

Initial Framework for Developing Digital Libraries for ODDE

This chapter adapts the Digital Library Reference Model and proposes a new model for developing and implementing digital libraries for ODDE. This has become necessary as the existing model does not meet the emerging challenges of the ODDE information environment (Arthur-Nyarko, Agyei, & Armah, 2020; Chou, 2018). Some of these challenges include new barriers of information access relating to the cost of subscription (Joachim Schöpfel & Claire Leduc, 2012), unfair policies relating to information provision in ODDE (Owusu-Ansah et al., 2018a), and unequal access to technology in ODDE (Lusigi, 2019).

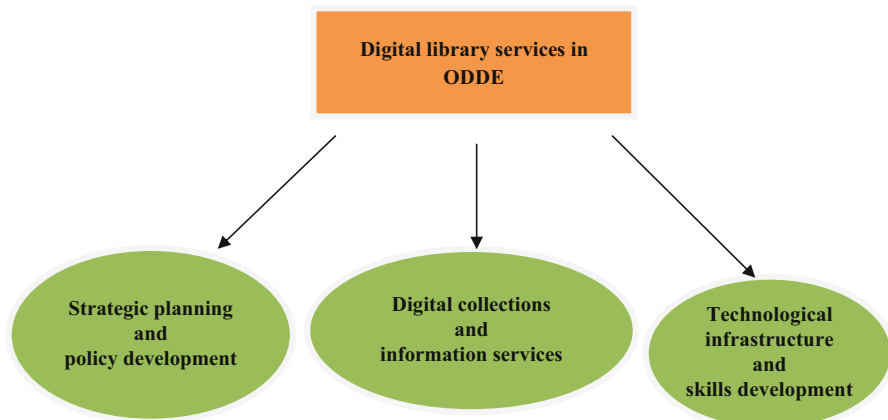


Fig. 2 The initial construct of the digital library framework in ODDE. (Source: Author construct, 2020)

In the new model, three core concepts, namely, policy, content, and architecture, are considered critical success factors for implementing digital libraries in ODDE. The necessity for a simplified construct has never been so important to enhance the implementation of a collaborative digital library in ODDE. They are adapted here as strategic planning and policy development, digital content and information services, and technological infrastructure and skills development. Furthermore, the two other concepts, the user and functionality, are subsumed under the three critical concepts. For instance, users may consist of underqualified teachers upgrading their skills through ODDE whose information needs must determine what manner of content the digital library is populated with. As a result, the user component is considered inseparable from the content component. Similarly, functionality, which represents the range of services the digital library provides, is also seen as an aspect of the content. Consequently, the user, content, and functionality are intertwined and discussed as aspects of distance learners' information needs. The new model is, therefore, portrayed in Fig. 2 and explained thereafter.

Strategic Planning and Policy Development

The success of every digital library project depends on the availability of policies and strategies in terms of the sustainability of its services and resources. Plans and policies on the digital library must include endorsed documents such as strategic plans, policy documents, and action statements. Strategic planning in digital libraries must take into consideration the economic, social, and ethical aspects of sustainability (Calhoun, 2014, p. 83).

From the economic point of view, there must be ongoing funding and a successful business model for recovering investments, and actions towards this goal may

include ongoing business planning, determining user needs and providing satisfactory services, and being accountable. According to Chou (2018), the absence of a long-term plan funding policy can negatively impact the resourcefulness and functionalities of a digital library. ODDE stakeholders, like other members of the academe, are confronted with several financial challenges in respect to access to quality information for their academic work (Fyfe et al., 2017). Among these include the high cost of subscription access and unsustainable models of information delivery in the electronic information realm. Increasingly, library information is held behind paywalls, a phenomenon of “pay to read” or “pay to download” (Björk, 2017). This is also referred to as the subscription access model, as opposed to the open access model which rather requires, in some cases, the authors to pay for the cost of the publication, so that the public can have free access to the content of the article on the Internet. The paywall model, so-called because one cannot access an article because there is a “wall,” that is the subscription charges, has become a major barrier to access to library resources in the ODDE community especially in the Global South (Collyer, 2018). Libraries in ODDE in these emerging regions of the world can eliminate this barrier by fashioning out collaborative policies in the form of library consortia and collaborative information-sharing schemes (Mohd, Yusof, & Umar, 2014; Sachin, 2018). Fyfe et al. (2017) view the idea of consortial access to digital library scholarly content in ODDE as akin to the strategies adopted by large commercial publishers manifested in mergers and acquisitions to consolidate their “oligopolistic” economic gains (p. 10). In the same vein, ODDE institutions and their planners stand to gain by forging “mergers” in the form of library consortia to acquire licensed digital content while benefitting from the shared experiences of each institution. Sachin (2018) argues that consortia agreements have a number of advantages including, among others, ensuring that the information needs of a larger population of users are met while also catering for the technical capacity of the personnel responsible for the implementation and operation of the digital library.

From the social perspective, libraries implementing digital libraries must have policies and strategies geared at providing long-term access to resources (Adjei, Mensah, & Amoahful, 2019; Baro, 2016); maintaining visibility and community awareness (Gireesh Kumar, 2020); and providing ongoing access to content and services that are valuable to the users (Siyao, Whong, Martin-Yeboah, & Namamonde, 2017). Finally, from the ethical point of view, a digital library may be sustainable if it has in place policies and strategies to provide equitable services to marginalized users such as distance learners by providing remote access to its content and resources (Chou, 2018) and at the same time upholding the rights of content producers and creators through policies and plans (Mwanzu, 2021; Calhoun, 2014, p. 83). At the same time, policies are used to manage access to digital resources (Arms, 1998). Chou (2018) maintains that there is a need for enduring funding and maintenance plans to ensure the financial sustainability of the digital library as it seeks to avoid losing the trust and credibility of its users.

Digital Collections and Information Services

Lesk (2005, p. 2) argues that the most important thing for digital library developers to consider is the content to meet user needs. Candela et al. (2007) asserted that content comprises “managed information” elements such as primary objects, annotations, and metadata. They argue that these may come in the form of special collections, maps, schematic data, or computer-generated graphics; copyright-free materials; and collections. Tedd and Large (2005, pp. 51–60) classify digital library resources into full-text materials, metadata sources, multimedia materials, and general websites. Many experts (Simamora & Gunawan, 2001; Ferguson et al., 2002; Perrault, 2007; Bower & Mee, 2010) are of the view that digital library resources provide essential remote support to meet distance learners’ information needs. Distance learners require digital content in various formats and from different sources for a variety of purposes such as completing assignments, writing dissertations, and supplementing tutorial lessons. In the context of ODDE, the effective use of digital library content requires opening access to digital resources. The need for opening access to research has never been greater in the twenty-first century. Simply, open access involves making the results of research freely available to everyone (Björk, 2017). In the age of high-speed Internet and computer infrastructure vis-à-vis pressing global, regional, and national challenges and emergencies such as the COVID-19 Pandemic and terrorism, several global bodies including the European Research Council are advocating immediate access to research results within their jurisdictions (Abdelrahman, 2020). This and other global efforts towards knowledge-sharing have given further impetus to the concept of open access publishing.

According to Abdelrahman (2020), there are three basic types of open access publishing. These are Gold, Hybrid, and Green Open Access. Gold and to some extent Hybrid publishing involve funding the cost of publications through article publication charges, government funds, or society grants. However, sometimes the inordinately high cost burden on authors from the Global South does not enable the widespread adoption and promotion of publishers of Gold and Hybrid journals in libraries from the Global South. Conversely, many institutions and libraries in emerging countries value the green road, representing modern models of sustainability. The green road, also known as Green Open Access involves the use of repositories for publishing scholarship. Consequently, academic libraries implementing digital libraries are focusing their lean resources on promoting green publishing through institutional and subject repositories (Kakai, Musoke, & Okello-Obura, 2018; Toledo, 2017). The infrastructure of these repositories is such that they promote collaboration and sharing of resources through the adoption and implementation of licensing regimes that enhance sharing, discoverability, and interoperability in ODDE (Ntim & Fombad, 2020).

Technological Infrastructure and Skills Development

Technological infrastructure ensures that the services and contents offered by the digital library are well integrated into hardware and software components (Anunobi & Ezeani, 2011). The infrastructure consists of the appropriate technical infrastructure and resources that ensure access to relevant information to digital library users. Furthermore, these include software and hardware, programs, and standards to ensure seamless access to information. The different components of technology enable networking and interoperability of different information technologies and tools. In this chapter, the following are considered critical to the deployment of digital library services in distance education: ICT infrastructure (computers, networking, connectivity, etc.); interoperability of different information systems (the seamless provision of distributed information services); and the use of appropriate software in the provision of digital library services for distance education. In ODDE, the significant challenge posed by lack of stable Internet connectivity and computing infrastructure has been noted to impact the uptake of new information models such as OERs and MOOCs (King, Pegrum, & Forsey, 2018).

Similarly, without the right mix of information and technology skills, distance learners may not be able to exploit the opportunities offered by the digital library. From the perspective of the ODDE community, in particular, some of the issues discussed in respect of technological and information skills include the level of computer experience, types of computer skills, availability of training programs, methods of training, the general perception of ICT skills, and challenges to digital library usage (Besseah, Achiro, Mhando, & Salau, 2017; Brewer, Rick, & Grondin, 2017; Saikkonen & Kaarakainen, 2021; Yu, 2017).

The Collaborative Model for Implementing Digital Libraries in ODDE

Previous findings (Owusu-Ansah et al., 2018a, 2018b) justify the use of the Digital Library Reference Model proposed by the DELOS Network of Excellence on Digital Libraries in developing and implementing an educational digital library for ODDE. In this chapter, three main variables adapted from the model, namely, strategic planning and policy development, digital collections, and information services, technological infrastructure, and skills development, were considered to be critical success factors.

From the literature (Owusu-Ansah et al., 2018a), it has emerged that strategic planning and policy development is the basis for the integration of digital libraries into distance education, and this involves establishing a formal need for using digital libraries in distance education as captured in the organizational mission, developing specific policies and rules for developing appropriate digital content and services, and obtaining the funding needed to sustain these services. All these constitute efforts at ensuring the sustainability of the digital library (Chowdhury, 2016). Digital collections and information services also involve the provision of appropriate digital library services and creating awareness and use of these resources in distance

education (Okoroma, 2018). The technological infrastructure consists of technical infrastructure and networking resources required for digital libraries, while skills consist of technology and information literacy skills needed by distance learners for the effective use of digital library resources, respectively (Aheto & Cronje, 2018; Baro, Obaro, & Aduba, 2019; Deal, 2016; Pratama & Scarlatos, 2020).

Again, previous studies (Owusu-Ansah et al., 2018a, 2018b, 2019) buttressed the need to consider integrating factors such as the need for librarians to understand their role in distance education and embrace collaboration with distance education stakeholders as these actions constitute the most effective approaches to integrating digital libraries into distance education (Owusu-Ansah et al., 2019). Through collaboration with distance education instructors (faculty) and coordinators (administrators), librarians are enabled to implement critical services such as information literacy and (digital) reference services in distance education. Furthermore, Tammamaro et al. (2017) pointed out the need to make changes to how teaching and learning are done in distance education to enhance the usability of digital library resources in distance education. These changes can be made possible through collaboration between library staff and distance education instructors on the one hand and with distance education administrators on the other (Zhang et al., 2015). Furthermore, the collaboration between librarians in different ODDE institutions can result in, among others, the following:

Enhancing Seamless Information Access in ODDE Through Inter-library Cooperation

The development of inter-library cooperation may be a viable response to the high and unsustainable cost of digital library resources for the ODDE community (Mazurek & Werla, 2011; Olesova & Melville, 2017). This may manifest as the use of sustainable information models for providing access to information for ODDE stakeholders. There is a need for policies to mitigate the effect of the paywall phenomenon (Björk, 2017; Chou, 2018). One of such economic policies is the idea of a library consortium. Since the ODDE community pervades one academic community, it makes sound economic sense for institutions implementing this type of education to resort to collaborative digital library service in the form of a library consortium to serve not just the needs of the ODDE community but their on-campus communities as well. The uniqueness of a collaborative digital library effort in respect to the economic factor is the fact that members may benefit from learning new skills, obtaining a stronger voice, optimizing resources, and eliminating operational flaws while empowering the users of the digital library (Pereira & Franco, 2020).

Furthermore, within each ODDE community, librarians must collaborate actively with ODDE stakeholders through a collaboration policy or an explicit statement on collaboration in a strategic document for supporting the implementation of digital library services in ODDE (Owusu-Ansah et al., 2018a). In his editorial on collaboration in the academic library sector, Atkinson (2019) pointed out the need for a

documented policy on the scope, goals, and objectives as well as outcomes and outputs among participants during collaborative initiatives involving academic libraries and other partners. Such a policy must also detail roles, accountability, and procedures for getting things done. Eventually, these will culminate in strategic guidelines and standard operating procedures for the members of the team (Atkinson, 2019).

Embedded Library Services as an Anchor of Collaboration

The implementation of digital libraries in distance education stands to benefit tremendously through the development of embedded library services which can appreciably raise the visibility and usability of digital library resources in distance education (Woodward, 2015). Several goals of embeddedness have been discussed in the literature including course design (Olesova & Melville, 2017; Skarl & Bosque, 2019), research support (Besseah et al., 2017; Brewer et al., 2017), open educational resources (Goodsett, Loomis, & Miles, 2016), and information literacy (Scheidt et al., 2016; Scheurer & Nadir, 2018; Schwenger, 2016).

In the distance education context, embeddedness requires librarians to seek collaboration with faculty counterparts in the development of online courses to enhance student learning. Olesova and Melville (2017) opined that embedded librarian collaboration with an online course faculty requires librarians to be involved in setting learners up, designing for content organization, developing instructional strategies, and addressing learning management issues. On the other hand, the impetus for a collaboration such as this may be, among others, the creation of dedicated distance library services with dedicated staffing equipped to perform both systemic and snap tasks to integrate library resources within the distance learning curriculum (Owusu-Ansah, Rodrigues, & Van Der Walt, 2018a). For instance, a long-term, systemic task may involve the embedded librarian creating a distance education Web page on the library website with a link to the distance education website where most or all relevant digital library resources are explicitly linked to academic tasks. Again, embedding may involve simple, snappy, tasks such as taking a snapshot of Online Public Access Catalogue results containing relevant books on a particular topic in a course and posting simple information on how to borrow a book. These outcomes of the embedded digital libraries were re-echoed by the European Library Automation Group when they explored the potential for cooperation between libraries and the academic community (Tammamaro et al., 2017). These efforts are poised to elevate library service provision in open distance education from beyond cooperation to collaboration (Olesova & Melville, 2017).

A Framework for the Collaborative Digital Library Model in ODDE

In view of the overwhelming need for collaboration between librarians and distance education stakeholders to ensure integration of digital library resources into distance

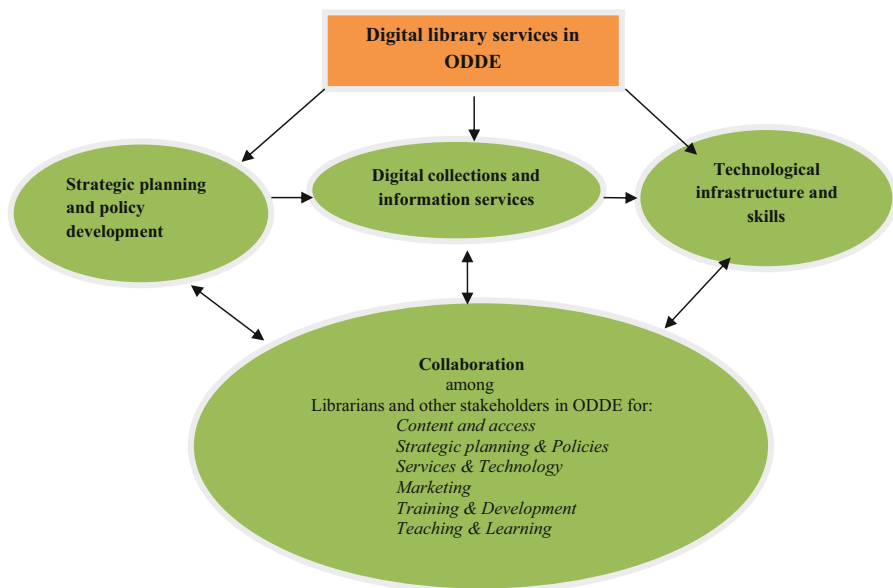


Fig. 3 Collaborative model for digital libraries in ODDE

education (Owusu-Ansah et al., 2018a, 2018b, 2019), this study readjusts the initial proposed theoretical framework to include an integrating factor of collaboration between librarians and distance education stakeholders as shown in Fig. 3.

Figure 3 represents the development of an educational digital library for ODDE with the collaborative digital library framework. This framework, however, proposes another component in the ODDE context, *collaboration*. Collaboration was recognized as a key factor for the successful integration of digital library resources into distance education. Collaboration is critical in the areas of strategic planning and policy development, services and technology, marketing, training, and innovating teaching and learning in distance education with digital library resources.

The significance of the framework is outlined as the following:

1. It presents a simplified theoretical foundation for the development and implementation of digital libraries in ODDE.
2. With the collaboration component, the framework isolates some important challenges distance education stakeholders and librarians are likely to encounter in using digital libraries. Some of these challenges include lack of strategic plans and policies for digital library use in distance education, poor technological infrastructure and information skills, lack of awareness of digital resources, and lack of integration of library resources into distance teaching and learning. Some experts are of the view that lack of collaboration in information literacy instruction can impact negatively digital library use (Buck, Islam, & Syrkin, 2006; Figa, Bone, & Macpherson, 2009).

3. Lastly, the collaboration component will enhance librarians' and ODDE stakeholders' awareness of the barriers to put in control mechanisms at every stage of the integration.

Conclusion

For successful implementation of digital libraries in ODDE, this chapter proposed **collaboration** as an independent component of the original digital library framework developed by the DELOS Framework on Digital Libraries. Collaboration is considered a critical success factor for digital library implementation. The updated framework holds the potential to deepen efforts aimed at integrating digital libraries into the curriculum of distance learners. The thrust of the model is that there is a need for collaboration between librarians and ODDE stakeholders, on the one hand, and with librarians in other ODDE institutions, on the other, in the areas of planning, designing services, selecting software, marketing, training, and transforming teaching and learning in ODDE with digital library resources.

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