



## The 'Open' Resource Phenomenon: Re-Inventing Library Operations in the Era of Openness

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# The 'Open' Resource Phenomenon: Re-Inventing Library Operations in the Era of Openness.

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## **Abstract**

*The shifting of power from centralized authorities and the need to democratize knowledge has been on the front burner. This, coupled with internet and its openness to providing free resources for people to solve problems means that libraries stand a good chance of benefiting from the abundance of open resources on the internet to provide and improve information services. The article takes a cursory look at openness, open era indicators and its significance in the digital age. The impact of openness on social norms, on power and governance was espoused particularly as it is sweeping away business practices and proprietary methods, highlighting the potential of openness in the realization of sustainable development goals. The interface between libraries and openness in promoting research by making publications and information available was examined; it also brought to the fore the impact openness has exerted on libraries in terms of fostering innovation/competitiveness, greater interoperability, increased autonomy of libraries, cost reduction, widened access to diverse population and so on. The paper highlights vividly the positive influences of open content, open data and open access initiatives on libraries and concludes by advocating for the re-invention of libraries by promoting open science, building a culture of assessment, leveraging on online communities, transforming the human element for innovation and enabling mobile strategies for access to collections among other recommendations*

Keywords: Openness, Open Resource, Library Operations, Open Access, Open Software

## **Introduction**

Openness refers to any effort to increase the accessibility of knowledge, technology, and other resources, the transparency of action, the permeability of organizational structures and the inclusiveness of participation. These systems are critical to the realization of a “sharing society”, as they demonstrate the benefits of breaking down institutional boundaries and of working collectively to design, create, distribute, and use new resources. The philosophy of openness is one that concerns itself with shifting power from centralized authorities of knowledge like owners to the community with its varied components like users, producers or contributors. The openness wonder is something very broad and profound and has been on the front burner over the recent past. It is not something that can be tied to a single year or a single event. It is quite complex in that it is a matrix of forces, some causative and some derivative, all of which tend to reinforce one another to perpetuate the trend. Openness is clearly a force that is both creative and destructive, and one that in retrospect is also inevitable given the forces and changes underlying it.

It is hard to specifically estimate when openness began to blossom, however what is sure is that the timing corresponds to the emergence of open source and the Internet. Early bulletin board systems (BBS) often were distributed with source code, and these systems foreshadowed the

growth of the Internet. It is really more the development of the Web around 1991 that signaled the real growth of the medium (Bergman, 2015).

Over the past decades, the written use of the term "open" has increased tremendously in the literature and "Open" has become somewhat of a magic word which people relate with positively. Materu (2004), cited in OECD (2007) viewed that the present decade can be called the o-decade: open source, open systems, open standards, open archives, open everything and that two most important aspects of openness is about free information and knowledge availability over the Internet and few technical, legal or price restrictions as possible on the use of resources. (Tuomi, 2005; Tuomi, 2006). Several suggestions have been made as to how "open" should be interpreted. Downes (2006) argues that the concept of 'open' entails at a minimum, no cost to the consumer or user of a resource. It is about claiming access to knowledge and information hidden behind paywalls and gateways that are often produced using public resources." Openness is important for the same reasons that access to knowledge is important, but it takes many different forms such as Open Content, Open Access, Open (Government) Data, Free and Open Source Software and Open Standards and so on (Shah,2014)

The openness movement has not left the library behind. Indeed, new system of open library has come up, and library is no longer a mere collection of books, it is now a source of information of the conventional or digital. The whole concept of information creation, storage, processing, and retrieval keep changing, and has greatly affected the working environment in our libraries. For librarians and libraries to respond to this new challenge, it is necessary to improve on our professional knowledge, operations, and skills by identifying and adapting to changes in the 'open library environment'. Hence, the nature, system, understanding of library and its services; its management as well as the sources of information have changed with the utilization of new web technologies and services. Information should be accessible, appropriate and affordable (Daniel, 2006)

In the context open library, the library is no longer focusing only to its individual members, or a regular library user within a particular area. Instead, the library became open, and provides an exciting opportunity for all interested library professionals, sharing its catalogue and resources to the public through internet archive as well as the library. (Joute, 2008)

### **Openness and Open Era Indicators**

Openness has been described as being more of a mindset or force, it is not itself a discrete thing, but an idea or concept. Openness as a concept has helped instigate the conditions that led to openness in other areas. As those areas also become more open, a positive reinforcement is passed back to earlier open factors, all leading to a virtuous circle of increased openness. Though perhaps not strictly "open," other related factors such as the democratization of knowledge, broader access to information goods and services, more competition, open environments, more diversity and more participation have become relevant. In contemplating this world of openness,

Bergman (2015) puts forward the following indicators which aptly captures the essence of the open era, and form the strands that provide the weave of the openness concept.

Open source -- refers to a computer program in which the source code is available to the general public for use and/or modification from its original design.

Open standards -- are standards and protocols that are fully defined and available for use without royalties or restrictions; open standards are often developed in a public, collaborative manner that enables stakeholders to suggest and modify features, with adoption generally subject to some open governance procedures

Open content -- is a creative work, generally based on text, that others can copy or modify; open access publications are a special form of open content that provide unrestricted online access to peer-reviewed scholarly research

Open data -- is the idea that certain data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control; open data is a special form of open content.

Open knowledge -- is what open data becomes when it is useful, usable and used; the key features of openness are availability and access wherein the data must be available as a whole and at no more than a reasonable reproduction cost, preferably by downloading over the Internet

Open access to communications -- means non-discriminatory means to access communications networks; because of the openness of access, additional features might emerge including the idea of crowdsourcing (obtaining content, services or ideas from a large group of people), including such major variants as citizen science or crowdfunding (raising funds from a large group of people)

Open rights -- are an umbrella term to cover the ability to obtain content or data without copyright restrictions and gaining use and access to software or intellectual property via open licenses

Open logics -- are the use of logical constructs, such as the open world assumption, which enable data and information to be added to existing systems without the need to re-architect the underlying data schema; such logics are important to knowledge management and the continuous addition of new information

Open architectures -- are means to access existing software and platforms via such means as open APIs (application programming interfaces), open formats (published specifications for digital data) or open Web services

Open government -- is a governing doctrine that holds that citizens have the right to access the documents and proceedings of the government to allow for effective public oversight; it is generally accompanied by means for online access to government data and information

Open education -- is an institutional practice or programmatic initiative that broadens access to the learning and training traditionally offered through formal education systems, generally to educational materials, curricula or course notes at low or no cost without copyright limitations

Open design -- is the development of physical products, machines and systems through use of publicly shared design information, often via online collaboration.

Open research -- makes the methodology and results of research freely available via the Internet, and often invites online collaboration; if the research is scientific in nature, it is frequently referred to as open science.

Open innovation -- is the use and combination of open and public sources of ideas and innovations with those internal to an organization.

From the foregoing, openness is a growing movement. Openness is bringing forth a major revolution in knowledge propagation, scientific research and scientific data, transparent analysis and reporting of studies and more open sharing of educational, experimental materials and raw data. But before this can be actualised, there is a need for more awareness and better understanding among librarians and other gatekeepers of knowledge about the meaning and advantages of openness and by extension open science. Researchers need to know that the response to the restrictions placed on the sharing and exchange of software codes, research data and research publications through proprietary access, which consequently have placed many of them in obscurity, is open science. (Ogungbeni, Obiamalu, Ssemambo and Bazibu, 2016).

### **The Impact of Openness**

The impact of openness on social norms, on power and governance is no doubt remarkable although many innovations have uniquely shaped the course of human history -- from literacy to mobility to communication to electrification or computerization; none perhaps appear to have matched the speed of penetration or the impact of "openness". Where did the concept of "openness" arise and what sustains it? The conclusion appears to be the Internet, specifically the Web, as reinforced and enabled by open-source software (Bergman, 2014). Open access to an environment of connectivity guided by standard ways to connect and contribute to knowledge have instigated further connections and contributions; it has reinforced the understood value of "openness", leading to further engagements. It has provided the world with a productive innovation environment in technology yet to be matched in all of human history. The web with its open access and standards has become the magnet for open content and data, all working to promote derivative and reinforcing factors in open knowledge, education and government. "Openness" becomes a form of adaptive life, changing the nature, value and dynamics of information and who has access to it (Bergman, 2015).

The forces propelling openness are strong. These forces are not only strong, but are sweeping away business practices and proprietary methods. In all of these, "openness" is a woven cord of forces changing the very nature and scope of information available to humanity. "Openness", now emerges as a criterion by which you evaluate the wisdom of various choices. "Open"

appears to contribute more and is better aligned with current forces. Business models based on proprietary methods or closed information generally are on the losing side of history.

In its recognition of the significance of Openness towards achieving the Sustainable Development Goals (SDGs), UNESCO (2012) identified free and open source software as possessing the potentials to transform the society.

It recognizes that:

1. Software plays a crucial role in access to information and knowledge
2. Different software models, including proprietary, open-source and free software, have many possibilities to increase competition, access by users, diversity of choice and to enable all users to develop solutions which best meet their requirements;
3. The development and use of open, interoperable, non-discriminatory standards for information handling and access are important elements in the development of effective info structures;
4. The community approaches to software development has great potential to contribute to operationalizing the concept of knowledge societies;
5. The Free and Open Source Software (FOSS) model provides interesting tools and processes with which people can create, exchange, share and exploit software and knowledge efficiently and effectively;
6. FOSS can play an important role as a practical instrument for development as its free and open aspirations make it a natural component of development efforts in the context of the Sustainable Development Goals (SDGs);
7. Consistent support plays an important role in the success and sustainability of FOSS solutions.

All software choices should be based upon the solution's ability to achieve the best overall return on technology investment. (UNESCO, 2012)

### **Openness and the Library**

The library as an institution has a lot to do with openness particularly as technology play an important role in the management of library operations. The need for the Library to build workable relationship with information stakeholders and content providers like publishers, distributors, library software publishers has become expedient in order to remain as open as possible. Technology has greatly influenced the facilitation of learning and the library's role in responding to this is critical to its success in the open world. Key concerns include; how does the library leverage on openness to support learning? How does the library's physical space become an enhanced learning environment?

The library's role can be diverse, it is a place for gathering or convening for instruction or social development, a place for information and knowledge curation with access and instruction on

resources and archived materials; a place for knowledge creation which includes making connections with people and expertise, and a place that offers a broad range of support in terms of formats, technology and pedagogical enhancements. (Crumpton, 2019) The role of libraries has evolved and as the priorities of information management have evolved, libraries will be key partners for the long-term future of open science and indeed openness. They are in the best position to take a broad view of what their patrons want. Over the years, the relationship between open science and libraries has deepened significantly and continues to grow.

Libraries play a pivotal role in promoting research and knowledge propagation at all levels. According to Wigboldus and Dotsch (2015), openness has been one of the criteria used by all types of libraries to promote research by making publications and information available to the public. It provides the opportunity for knowledge to be published openly and used by all. This has a significant impact on the work academic libraries do to satisfy the information needs of their customers. Three aspects are particularly important to academic libraries: their role in open publishing, the impact of openness on their collections and information service work, the rise of research data and methods as information materials alongside publications. There is no doubt that libraries have invested a great deal of work in promoting openness, particularly in relation to open access publications.

### **Librarianship in the context of Openness**

The evolution of the library over the decades and centuries is a clear demonstration of the adaptability of libraries and its ability to transform to meet our changing yet improved circumstances. Libraries have significantly benefited and leveraged on the internet and technology and in the same light, the open movement has impacted libraries and vice versa. How has openness impacted libraries? In this regard, it takes different forms. This papers will discuss some : open standards, open content, open access and open data; and how libraries should take advantage.

#### **Open Standards and Libraries.**

There are many technical, social and ethical intentions for the adoption and use of open standards. Some of the reasons why libraries and other organisations utilising public money should adopt it are to foster innovation/competitiveness, greater interoperability, increased autonomy of libraries, cost reduction, widened access to diverse population, longevity of archived data and longevity of archived data

Innovation/competitiveness: the adoption of open standards could be the basis of innovations in libraries; the internet provides loads of open standard platform that libraries can leverage on for improved relevance. The internet and associated services like the world wide web are based on open standards such as TCP/IP, HTTP, HTML, CSS, XML, POP3 and SMTP . These standards have also worked for libraries, creating a level playing field that ensures delivery of innovative services in libraries. Instant messaging, voice over internet protocol (VoIP), wikis, blogging, file-sharing and many other applications with large-scale global adoption should be handy tools for libraries to create impact in communities.



**Greater interoperability:** With open standards libraries are able to use online products and services from competing vendors interchangeably and simultaneously in a seamless fashion, without having to learn additional skills or acquire converters. The mail standard IMAP for instance can be used from a variety of operating systems (Mac, Linux and Windows). Libraries are encouraged to adopt open standards which on themselves are interoperable with different technologies that we may deploy in our libraries. Email would be a completely different experience if we were not able to use it on different operating systems.

**Increased library autonomy:** Open standards would empower libraries by transform them into co-creators of content. Open standards prevent vendor lock-in by service providers thus ensuring that libraries are able to shift easily from one product or service provider to another without significant efforts or costs resulting from migration.

**Reduced cost:** Patent rents on propriety products and services are eliminated via open standard, resulting in a reduction of total cost of ownership. This will help libraries develop free products and services for the poor especially funded by tax payer money.

**Widened accessibility to all:** Operating system-level accessibility infrastructure such as magnifiers, screen readers and text-to-voice technology require compliance to open standards. This is important for libraries in its quest to widen information and knowledge access to person with disabilities. Open standards therefore ensure greater access to knowledge to diverse populations, the elderly, and neo-literate and illiterate users.

**Longevity of archived data:** Open standards would assist libraries to protect archived information by ensuring that the expiry of software licenses does not prevent it from accessing its own stored data. They also ensure that knowledge that has been passed on to our generation, and the knowledge generated by our generation, is safely transmitted to all generations to come.

**Information monitoring:** Public archives and indeed libraries are able to keep abreast of the ever-increasing supply of text, audio, video and multimedia information generated by the global news and entertainment organizations through open standards.

### Open Content and Libraries.

The Open Content licenses provide certain freedoms to libraries and users by granting them rights, such as the right to copy the work and the right to distribute the work. This is of course important for library services delivery. Depending on the particular license, libraries may also have the right to modify the work, create derivative works, perform the work, display the work and distribute the derivative works.

Libraries can also create derivative work. Any work that is based on an original work created by you is a derivative work. The key difference between different kinds of Open Content licenses is the method that they adopt to deal with the question of derivative works, though the ability to control a derivative work through a license is perhaps the most important aspect of the Open Content licenses. Since libraries cannot make a derivative work without permission, this would be granted on the condition that the library also allows others, and especially its teeming users to use the derivative work freely. In Open Content licenses, the right to create a derivative work

normally includes the right to create it in all media. Another important aspect is that libraries can use open licenses for non-commercial purposes; which is what libraries stand for: openness of knowledge. Adherence to procedures must be followed by libraries and credit should be accorded the author of the work.

Content is for people's use and it was the library which facilitated access to knowledge for use by the lay public. Technology has widened access to information, enabling large scale production of content in different formats. The Internet era, not only helped traditional libraries to introduce new services but also gave birth to many free and open libraries such as **Internet Archive** and **Project Gutenberg**. The Internet Archive aims to provide 'universal access to all knowledge' and includes texts, audio, moving images, and software as well as archived web pages, and provides specialized services for adaptive reading and information access for the blind and other persons with disabilities. Project Gutenberg encouraged the creation of ebooks. The best known examples of more recent initiatives are **Europeana** and the **Digital Public Library of America (DPLA)** both of which took full advantage of the possibilities offered by the Internet.

New media such as YouTube and content platforms like WordPress have made users to be potential authors and not mere consumers of information. This also applies to libraries. Content provision should be the concern of libraries given the availability of tools that allow for content creation. There is the need for emphasis to be placed on the read-write culture on the internet. In this vein libraries can do a lot with creative common license. Creative Commons (CC) is a non-profit organization that functions across the world to provide licensing tools to authors of creative works. The key distinguishing feature of this system is that the authors have the right to decide under what license they want to make their work available.

### Open Access and Libraries

According to Budapest Open Access Initiative, by open access we mean the free availability of research literature on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers. Libraries have an important role to play here with regards to the free access to information resources to all who care.

It is true that libraries and other content providing organizations provide free access to vast quantities of textual (and other kinds of) information. Libraries should strive to disseminate variety of content thrown open by creators and these include hundreds of educational courses, open government data, open monographs, open images and so on. Unfortunately, users are barred from downloading or reading research papers without paying albeit these are papers written by scientists, reviewed by scientists; the research often paid for by government agencies. The knowledge therein is of relevance not only to other scientists but to the lay public as well. The need to democratize knowledge has become very necessary.

Libraries in most developing countries cannot afford to subscribe to key journals needed by their users as scientists and authors are forced to work in a situation of information poverty. Due to spiraling costs, libraries are forced to cancel subscription to several journal databases. Scientists elsewhere are unable to access what developing country researchers are publishing, leading to low visibility and low use of their work. These challenges can be mitigated with widespread adoption of open access and libraries becoming pro-active in the creation, management and dissemination of scientific and cultural knowledge; playing a frontal role in the movement towards a global and interactive representation of knowledge in which world wide access is assured.

Libraries need to promote open access journals archiving and dissemination to users; removing barriers of subscription to journals and databases. Libraries should also make research information available and accessible to the rest of the world through repositories. In the open era, it is crucial for libraries to be in the fore front of building institutional repositories with content made available to a global audience. Libraries also need to archive all available open repositories from institutions and disseminate their content. A good example is arXiv. Research papers placed in arXiv are seen instantly by other researchers globally. Others are SSRN ( Social Science Research Network) , CiteSeerX , Registry of Open Access Repositories, Directories of Open Access Repositories and more.

### Open Data and Libraries

Open data is data that can be freely used, reused and redistributed by anyone. This has become increasingly important today as governments are capable of gathering unprecedented amount of data about their country and her citizens and store various kinds of data which can actually be made available to people easily using technology. It has become imperative for our governments to launch a single-point access; an Open software Government Platform that would aggregate governmental data in form of datasets and apps published by the government's ministries, departments, agencies and organizations and made available to public access. There is the need to make government data more open especially in the context of the freedom of Information act.

An open democratic society requires that citizens know what the government is doing with a high level of transparency. Free access is essential for this and in order for information to be intelligible; data should be reusable as well so it can be analyzed further. In the information age, commercial and even social activity requires data and having government data open can be a way to fuel economic and social activity within the society (Wright et al, 2011). The library is a veritable instrument for the management and dissemination of government information, The National Library of Nigeria and its branches throughout the country, the public library system are critical to the attainment of this goal. These libraries can engage in sensitizations campaigns and advocacy to further make government open data resonate with the people. If public tax payer

money was used to fund the government data, then the public, the citizenry should have access to it.

There are benefits resulting from having government data open which libraries can propagate and disseminate. First, it will benefit government, by reducing the burden of locating information. Citizens and the variety of civil society organizations in Nigeria currently working with government data will be able to create better tools and analysis as well as elevate discussions with government. It would expose incorrect and outdated data, which the government itself is often not in an easy position to detect. Ultimately, it is a step in delivering the promises of the Right to Information Act, and a step towards greater transparency and importantly, accountability in governance at all levels.

### **Re- Inventing the Library for Success**

Libraries and librarians should take the front seat in the campaign for open source, open access, open science and indeed openness. Libraries and researchers need to work together to publicize research works; create awareness for these works and disseminate the information contained in them; this is achieved through institutional repositories, which are made public both internally and externally (Ogungbeni, et al, 2018). Ghosh, (2009) viewed that the huge quantum of information available for research, which has led to more metadata-related activities, provides new opportunities for librarians to communicate with new domains, including publishing, recording and content development and other allied areas concerned with digital object creation and management. The basic skills of librarians in locating, collecting, organizing, evaluating and disseminating information had been having important effects on the creation, development and management of digital content.

Libraries need to take the lead by promoting open science/open access as much as possible because its focus is on making information available to those that need it to change their lives or add to their knowledge and innovations. Recently, the exponential growth of institutional repositories and open access publishing models has swung wide open the access paradigm.

Nigerian libraries and specifically academic libraries should do more in library services provision; introducing their researchers to open access institutional repositories (IRs) for wider coverage of scholarly literature by their colleagues; formulating institutional policies to guide IR operations, training of the academic community(students and staff) in the adoption and use of IR, harvesting and publishing of relevant OERs platforms and outlets in subject areas for use of staff and students. Arunachalam (2004 cited in Ogungbeni et al, 2018) opined that information professionals which of course include librarians should become champions in their respective institutions and take the leading role in promoting the open access movement.

We also need to re- invent how to use the library's spaces and designs. Space management in libraries is not about the building but what is happening inside the library building (Hendricks, 2019). Openness in the library should also see to how it transforms the library to learning spaces

with the capacity to attract users, re-designing and renovating it, stimulating learning with innovative services and practices that opens the library up as a true and strategic knowledge institution. Libraries need to work to build competencies to plan for the design and operations of learning spaces. The library is essentially a learning environment and it should work to foster meaningful community engagement process with stakeholders and develop a vision that embraces how learning is achieved inside the building. This planning process is meant to occur before starting to discuss the facility issues and reinforces the concept of a library that is more than books or resources, but also a place to learn in a variety of ways (Crumpton, 2019, Crumpton, 2018 )

#### Re-Inventing Libraries: Building a Culture of Assessment

In order to further entrench openness in Nigerian Libraries, the need to be more intentional in assessing our services, workflow and resource allocation has become expedient. Our operations success should be premised on facts, research and analysis and in which services are designed to maximize the benefits of patrons (Phipps, 2001). The culture of strategic planning should be imbibed. Without clear goals and objectives, we would not have a standard which we could begin assessment. We need to stop doing all those activities and work that is not moving us towards our goals. Libraries should foster a flexible, adaptable and creative environment; developing user-centered services and programmes rather than resource centered ones.

#### Re-Inventing Libraries—Building Online Communities

The influx of disruptive technologies which has significantly changed the way we live, work , educate means that as libraries, it is important that we leverage on these tools and techniques to further reach users regardless of their location in the spirit of openness. Libraries should build online communities of users and stakeholders. There are enough ‘open’ tools to make this happen. Innovative services are required to move our libraries forward, we need to interact with users in a free and open minded way; a no hold barred method. Community members are key to sharing best practices with colleagues.

#### Re-Inventing Libraries—Transforming the Human Element for Innovation

The open movement rightly depends heavily on internet and technology. The strength of librarians and other library workers lies in their ability to bring new and innovative ideas to the information workplace. We need to bring on board innovative paradigms in getting things done rather than getting entrenched in the comfort zone of monotonous routines. In order to build a truly open library, the library professionals must have the knowledge and skill to blog, start wikis, create podcasts, produce videos and take up any technological task that may be necessary to reach its immediate and potential users. The truth is, today’s users wants library services and content delivered the same way as entertainment.

#### Re-Inventing Libraries-Mobile Strategies for Access to Collections

The reach of libraries has become important in order to engender openness and as mobile technology become more pervasive and powerful, libraries should promote access to its collections through mobile devices which have become ubiquitous. Mobility is changing the way we learn, share information, deliver content and by extension should shape access to library services. We also need to consider evolving best practices for developing new digital projects and services with mobile interfaces. Librarians should do more in terms of building digital skills, become experts will mobile technologies, and work with IT experts to ensure their digital collections are mobile friendly (Thomas & Murphy, 2009). It will be nice to see users use mobile devices to interact with their library accounts.

## Conclusion

This paper has brought to the fore the reality that libraries are critical partners in the movement towards openness. As access to knowledge has become instrumental to achieving success, so is openness crucial to the attainment of an informed and egalitarian society. Librarians' adherence to the realities and principles of openness in the discharge of their duties and operations is necessary to ensure that libraries are active players in this open era. The need to re-model library operations to bring knowledge to all and sundry using open tools and techniques and shunning all forms of the fast disappearing proprietary resources has become expedient. The paper has also put forward strategies towards re-inventing our libraries to imbibe the tenets of the open era; building communities, adopting mobile strategies and transforming librarians for innovative practices. The library today is not focused on individual users nor is it concerned only about users within a geographical area; rather its constituency is global providing exciting opportunity for all interested in learning.

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