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Developing a Framework for Information Resource Sharing in Information Centres in Electric Power Sub-Sector in Kenya

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Abstract:

The study focused on information resource sharing programs in the Electric Power sub-sector in Kenya. The aim of this study was to investigate information resource sharing activities in ESI, to identify shortcomings and to suggest strategies for their improvement that leads to development of an information resource sharing framework. Specifically, it examined information resources and services available, their access and use; it determined the forms and adequacy of information resource sharing activities; the extent of ICT use in information resource sharing; the challenges ESI experiences in information resource sharing; and finally, recommended strategies for improvement that led to developing a framework for information resource sharing activities in ESI. The study was informed by Intra-type Resource Sharing Model and the Secure Layered Model for Digital Libraries Interaction. Both qualitative and quantitative approaches were used. The study employed exploratory method and applied purposive sampling. Senior staff of information centres in ESI were sampled and face-to-face interview used to collect data from them. Under the quantitative approach, survey method was employed and it applied simple random sampling, using questionnaire as the data collection instrument. Both narrative and descriptive results were used for data analysis. The study revealed that there is availability of varied information resources and services, that access to and use of information resources is not as extensive as it should be, that there was a lack of a formal program on information resource sharing and inadequacy of informal information resource sharing activities. The study revealed that the use of ICT in information resource sharing activities is limited. It also identified challenges like inadequate resources, users' unawareness of services available and limited networking among information centres. In conclusion, the lack of a formal information resource sharing program in ESI negatively affects information services. The recommended strategies for improvement were: establishing more information centres, automation and digitization of existing centres, enhancing policies on information resource sharing and the use of the developed framework for information resource sharing. A framework in information resource sharing has thus been developed and proposed for adoption in ESI.

Keywords: *Electric Power Sector, information resource sharing, information centres, information services, library services*

1. Rationale of the Study

In a technology driven economy that Kenya has become, distribution and management of power supply is essential. Electricity Supply Industry Sub-sector (ESI) is one of the three sub-sectors in the energy sector with the mandate to supply electric energy throughout the country. It is a large sector that has diversified activities and covers a wide topographical area when it comes to the distribution of electricity. In today's information age, information resource sharing contributes significantly to the country's economy. This study focused on information resource sharing among the information centres in ESI. The use of information resource sharing in ESI is linked to the quality of existing information services, efficiency and effectiveness of information management, enhanced communication across the players in ESI sub-sector and quality of data and information access.

2. Information Sharing in Kenya Electricity Supply Industry (ESI): Introduction

Power generation, distribution and management are dependent on different operators that have distinct roles. These diverse roles in an industry that is highly dependent on information sharing.

The Kenya Electricity Supply Industry (ESI) is one of the three sub-sectors in the energy sector which the Ministry of Energy (MoE) exercises oversight on behalf of the Government of Kenya (GoK). The energy sector has been undergoing restructuring and reforms since the mid-90s, which culminated in the enactment of the Energy Act, No 12 of 2006 (The Energy Act, 2006). Before 1998, Kenya Power and Lighting Co. Ltd (KPLC) was charged with generation, transmission and distribution of electricity in Kenya under the Electric Power Act, 1982. According to The National Energy Policy (2012), The Electric Power Act of 1997 brought about the separation of generation from transmission and distribution functions. This Act and the Sessional Paper No. 4 of 2004 on Energy widely liberalized the energy sector in the country which was started in 1997 when KenGen was formed out of KPLC. KPLC was later unbundled from Kenya Transmission Company (KETRACO), Rural Electrification Authority (REA) and Geothermal Development Authority (GDC). Under the Energy Act No. 12 (2006), MoE is responsible for formulation and articulation of policies through which it provides an enabling environment to all participants in the energy sector.

KenGen came about as a result of splitting energy generation functions from transmission and distribution in KPLC in 1997. It was charged with managing all public power generation facilities in the country. KenGen accounts for close to 80% of generation, while 20% is generated by six (6) Independent Power Producers (IPPs). The company utilizes various sources to generate electricity ranging from hydro, geothermal, thermal and wind.

KPLC itself is the transmission, distribution and retail supply of electric energy to end users. It ensures that there is adequate line capacity to maintain supply and quality of electricity across the country. The interconnected network of transmission and distribution lines covers about 41,486 kilometers. KPLC purchases power in bulk from KenGen and the IPPs through bilateral contracts or PPAs approved by ERC.

Faced with the urgent need for acceleration of rural electrification in the country, Rural Electrification Authority (REA) was formed. This player was established under Section 66 of the Energy Act 2006 to, among others, develop and update the rural electrification master plan, implement the rural electrification programme and promote the use of renewable energy sources.

GDC was formed in 2009 for the purpose of exploiting the huge but largely untapped geothermal energy potential. The creation of GDC was based on the government's policy on energy, Sessional paper No. 4 of 2004 on Energy, and the Energy Act No.12 of 2006, which un-bundled the key players in the electricity sector to ensure efficiency. GDC's activities include exploration, drilling, assessing and development of geothermal steam for power generation and alternative uses. GDC's goal is to drill 1400 steam wells to provide steam for the generation of 5,000MW of geothermal power by 2030.

KETRACO was formed in 2009 under the Company's Act, CAP 486, to develop new transmission lines. It was incorporated by the government to accelerate transmission infrastructure development. Its mandate is to design, construct, operate and maintain new high voltage electricity transmission lines which would form the backbone of the National Transmission Grid and regional interconnections.

TARDA, which owns the dams on Tana River for generating hydro power, has a primary role of acting as the strategic driver of regional economic development in the region. It is responsible to the Government through the Ministry of Regional Development Authorities for planning, coordination and implementation of projects within the Tana and Athi river basins. One of its mandates is to assess alternative demands of the resources within the area, which include electricity power generation, irrigation, among others, and to recommend economic priorities.

ERC is established under the Energy Act, 2006. It is a single sector regulatory agency with responsibilities for economic and technical regulation of electric power, renewable energy, and downstream petroleum sub-sectors, including tariff setting and review, licensing, enforcement, dispute settlement and approval of power purchase and network service contracts. It also monitors, ensures implementation of, and sees to it that the principles of fair competition are observed in the energy sector in coordination with other statutory authorities.

2.1. Information Resource Sharing and ESI Players

All players in ESI have made the effort to have functions set up to serve the information needs of their respective users. Okeagu and Okeagu (2008) indicate that libraries have realized that no matter how well-funded they are, it is difficult for them to acquire all the materials needed by their clientele. Partnership and cooperation is inevitable for information centres in ESI sub-sector. Presently, the information centres of ESI work independently of each other. These institutions strive on their own with the aim of meeting the demands for varied information services for their clients. The membership of each information centre is restricted to those working in its parent organization. The information centre in KPLC was established as the first initiative to serve East Africa Power & Lighting Company's information needs. This was followed by the information centres in TARDA, KenGen, REA, KETRACO and GDC, all after their inception. According to Ministry of Energy (2012), there is need to form an inter-agency committee that will ensure close collaboration with institutions like KEBS and KIPPRA that collect, analyze and prepare policy papers to facilitate accessing specific information relating to the energy sector. There is also a need to enhance research linkages between industries and the academia. Information Services and Systems in ESI are best placed to accomplish these objectives if they are to strengthen information resource sharing initiatives. All information centres in ESI have their independent policies that guide in the acquisition, processing, organization, dissemination, preservation and disposal of materials.

3. Problem Statement

The individual goals of information centres in ESI are focused towards a general common goal, which is the availability of cost-effective quality energy. These centres not only enjoy strong working relationship with each other but also require exchange of information. There are no known evidence of formal arrangements or policies regarding information resource sharing among the players of ESI. Limitation to the access of relevant information by key players impacts negatively on their operations, upgrading of the infrastructure, research and innovation initiatives and the effort towards achieving Kenya Vision 2030. The information centres lack coordination and cooperation to reduce strains, time and stages in the accessibility by each ESI player to shared information resources. Thus, the likelihood of a lack of a formal information resource sharing program in information centres in ESI is suspected to have denied the players of ESI relevant and timely information in their current operations. The aim of this study was thus, to investigate information resource sharing activities in ESI, identify shortcomings and suggest strategies for improvement so as to develop a framework for information resource sharing.

4. Purpose of the Study

The study aimed at investigating information resource sharing activities in ESI, identifying shortcomings and suggesting strategies for improvement so as to develop a framework for information resource sharing. The objectives of the study were to:

- Examine information resources and services available in ESI.
- Establish the access and use of information resources and services in ESI.
- Determine the forms and adequacy of information resource sharing activities in the ESI sub-sector.
- Determine the extent of ICT use in resource sharing activities in ESI
- Identify the challenges experienced by ESI players in information resource sharing activities.
- Suggest strategies for improvement that lead to developing a framework for information resource sharing activities in ESI.

5. Literature Review

5.1. Theoretical Framework

The study explored the theoretical framework in information resource sharing and considered several models related to Wilson's Model of Information Behavior, a model of Information Sharing in Industrial Organizations, A Secure, Layered Model on the Interaction of Digital Libraries Interaction, a model of Collaborative Information Behavior, Web-based Information Services and Resource Sharing, and Intra-type Resource Sharing model. It ultimately used A Secure, Layered Model on the Interaction of Digital Libraries Interaction and Intra-type Resource Sharing Model to guide the study.

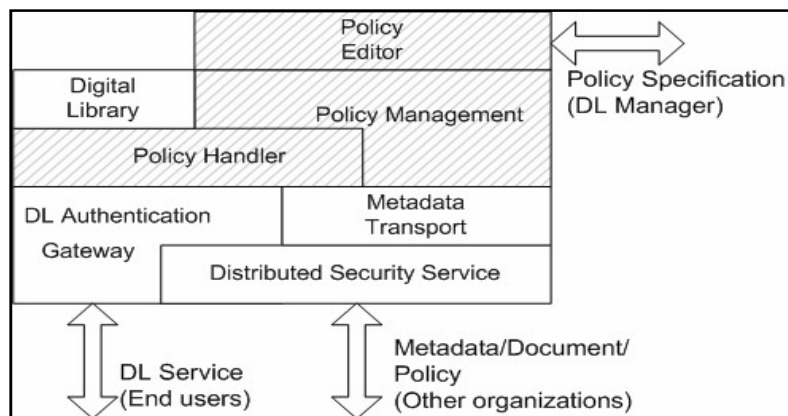


Figure 1: A Secure, Layered Model on the Interaction of Digital Libraries interaction
Source: Bhoopalam, 2007, p.3

Figure 1 shows the architecture in support of the authors' proposal for the target environment, which is a set of digital libraries (top left in Figure 1) that interact with two of the core layers (shaded components in Figure 1), of the infrastructure. This model is a visible representation of how systems in ESI can be used in sharing information among different digital libraries according to policies set by high level managers of information centres.

The study adopted the Intra-Type Resource Sharing Model. In the ESI sub-sector, knowledge resources have spread all over among the players, thus making it difficult for an individual library to satisfy all its users' needs. Just as is happening in ESI, Sharif (2006) states that informal resource sharing is being practiced in libraries in Pakistan and other developing countries. These collaborative arrangements enable patrons to access resources not within their reach. With the Intra-type Resource Sharing Model shown in Figure 2, Sharif (2006) states that libraries of the same kind can share their resources. Since the level of participating libraries is nearly the same, this model can be easier and more beneficial to adopt. To effectively

implement this model and establish a program that is well documented, Sharif (2006) asserts that librarians should seek support from their parent organizations. Defining good programs needs preparation and definition of policies, procedures, structures and standards.

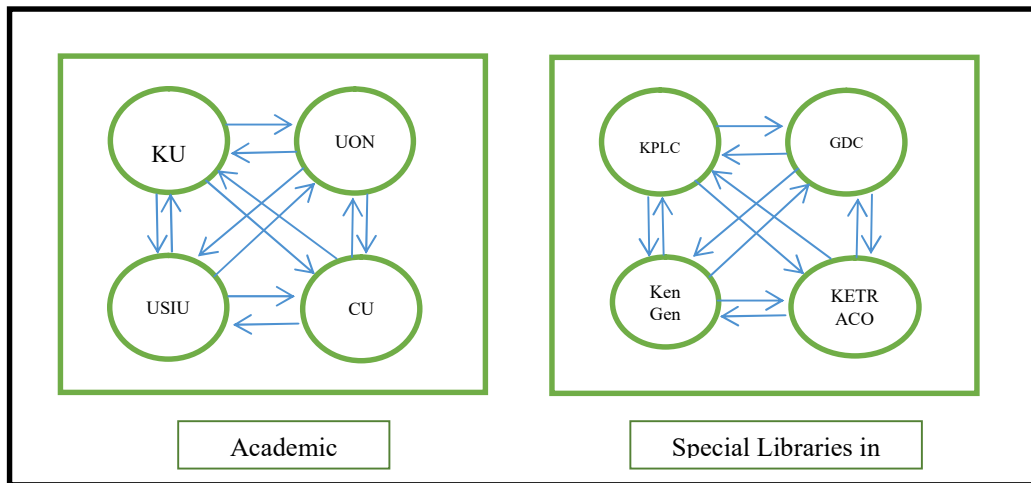


Figure 2: Intra-Type Resource Sharing Libraries
Adopted from: Sharif, 2006, p. 113

5.2. Information Resource Sharing

According to Sartija (2009), information resource sharing in libraries has long been used to improve access and service through borrowing and lending from other libraries. Kaul (2001) states that the voluminous growth of published documents in the recent past, increasing cost of information sources, technological advancements that offer newer methods of information processing, retrieval and dissemination are some of the factors which have made resource sharing a necessity. Leigh (2012) implies that every business needs information to help it succeed. A combination of internal and external business information resources can provide the background necessary to evaluate current performance and plan future progress. Understanding the various sources of information and how to access them can help companies and their leaders stay on top of emerging trends and environmental factors that affect their success. Some of the external resources of information include government agencies and departments providing information on laws and regulations, industry statistics and industry analysis.

Information services have been hard-pressed to transform their services due to the changing needs of their users. DAC and NCLIS (2009) argue that we must address the needs of existing knowledge societies; today's society is a learning society. Due to information explosion which affects our ability to meet our customers' information needs and economic uncertainty and/or downward-spiraling budgets, Soete (2002) states that we are forced to explore strategies, such as resource sharing, with greater intensity in order to improve the capacity and quality of information services. Borderless libraries will connect different libraries to each other so that users can access information and materials from any library in different geographical regions. Standing at the edge of 21st century, there is probably no dispute over the recognition of ICT technologies in information activities. Changes and growth in technologies have had an impact on the libraries' structure of the services over the last two decades (Siddike, 2010). According to the author, application of ICT to library and information work has revolutionized the traditional concept of libraries from store houses of books to intellectual information centers, conveying the concept of electronic library. Geronimo and Aragon (2005) state that the organization of libraries into resource sharing consortia and networks are alternatives to address former problems, like the cost of acquisition, bibliographic processing and storage of documents, and the astonishing growth of information produced.

According to Xin-li, *et al* (2006), human beings have great comparative advantage on information resource because of the long and splendid civilization. This study by Xin-li, *et al* (2006) on information resource and knowledge production concluded that the characteristics of a good information resource as being easy to share, easy to co-construct, value-added, volume-added, low space-time sensitivity and having high space-time benefit. Knowledge production is an important way to exploit and utilize the information resource. Resource digitization, transmission by network, management automation, analysis intelligentization, division of labour specialization, service individualization and mode diversification have become the important areas in the development of information resource. When information and knowledge are shared, materials may come from various ways.

As much as the literature addresses information resource sharing in industries inferred, it however doesn't address the specific area of information resource sharing in the energy sector in Kenya of which ESI is a sub-sector of.

6. Research Methodology

Combining the qualitative and quantitative approach the study used a combination of narrative and survey research design was used to investigate the lack of a formal information resource sharing program which has denied players of ESI relevant and timely information for their operations, resulting in low quality of work and hence affect the quality of service to customers. The survey design provided a quantitative description of trends, attitudes and opinions of the population of users of information centres in ESI-subsector by generalizing from a sample of this population. Nine key informants were selected using purposive sampling. These were persons responsible for managing information centres. The study used 3320, the number of registered library users as the sample frame. The samples were distributed in each ESI player randomly. The sample size was obtained from the sample size calculator and tables from The Research Advisors (2006) as 250. It was determined by using the confidence level of 95%, confidence interval (margin of error) ± 6 . Face-to-face interviews and questionnaires were used concurrently to collect data. For qualitative data collection, forms used for recording the information needed were prepared using Microsoft Excel application. On this form, there was a record of the description of events and processes observed, and reflective notes about emerging codes and themes that arose during data collection exercise. Before conducting the research, the instruments were pre-tested using the criteria on 6 (six) respondents. The feedback and experience from the pre-test was used to improve the content, reliability and validity of the interviewing schedule and questionnaires.

Data analysis used a combination of thematic analysis for the qualitative data and descriptive analysis for the quantitative data. Thematic analysis focused on identifying themes within the data. Codes were typically developed to represent the identified themes and then linked to the raw data as summary markers for further analysis. The descriptive analysis was used for quantitative data obtained from responses of the questionnaires distributed randomly. This helped in describing and summarizing the data in a meaningful way. Using the qualitative method approach, the researcher merged both qualitative and quantitative data.

7. Results and Discussions

7.1. Data Analysis and Interpretation

A combination of thematic analysis which focused on identifying themes within the data for the qualitative data and descriptive analysis for the quantitative. For thematic analysis codes were typically developed to represent the identified themes and then linked to the raw data as summary markers for further analysis. Descriptive analysis was used to analyze quantitative data obtained from responses of the questionnaires distributed randomly.

7.2. Response Rate and representation

Combining the response rate of both qualitative (100%) and quantitative (78%) data collection gives a total response rate of 89%, adequate for a study of this magnitude. The highest representation was from Information Centres of Kenya Power, followed by KenGen. Management category had the highest level of representation with 156 (62.4%) respondents. The gender representation was biased in favour of male, with 175 (70%) men compared to 75 (30%) female.

7.3. Organizational Resource Centre Profile

On the basis of the first objective of the study which is, to examine information resources and services available in ESI as shown in the study went on to the next step of identifying the types and sizes of information centres that exist so that an overview of their setup, their business and purposes could be observed.

Information Centre	Type of Information Centres	Age (Years)	Size of Collection
GDC	Information resource centre	4	450
Kenya Power	Executive library	16	1300
KenGen	Information resource centre	13	6000
ERC	Information resource centre	14	700
KPLC	Records and archives	7	8,000,000
TARDA	Special library	23	10,000
Training School	Academic resource centre	19	15,000

Table 1: Organizational Resource Centre Profile

7.4. Management and Information centres

The first and second objectives of the study were achieved by these findings. The objectives were to examine information resources and services available and to establish the access and use of information resources and services in the ESI sub-sector.

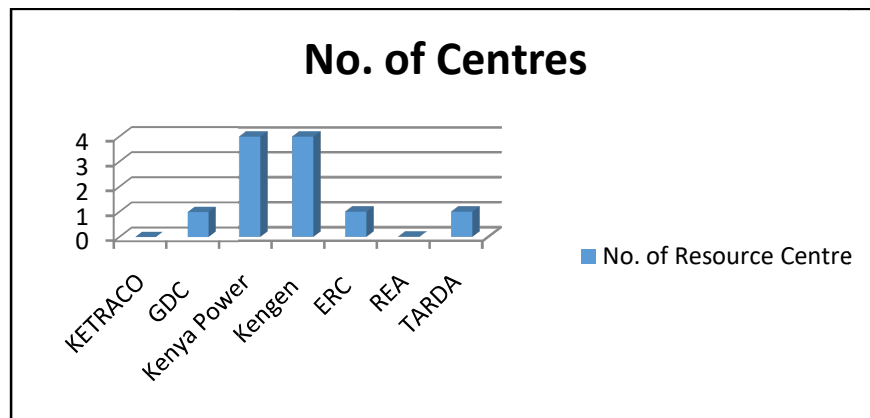


Figure 2: Information Resource Centres

Kenya Power and KenGen had the most number of information resource centres as shown in Figure 3. KenGen had regional libraries in its Central Office, Turkwell, Olkaria and Seven Folks Stations; ERC, GDC, TARDA each had one information centre; and KETRACO and REA had none.

7.5. Types and use of information resources

The study found out that different types of information resources, both print and non-print, were available in all the information centres that were assessed. The training school academic library has books as the most used resources by the users while a special library like ERC library has its reports used more frequently than books. In GDC and ERC, Government publications are the most frequently used resources. The Executive library reported books and serials as being the most used resources. KenGen reported company documents and books as being the most frequently consulted as KPLC Archives reported records as being the most frequently used resources. The subject areas of these materials are technical and related to the business area of the ESI players. TARDA has most materials relating to dams, irrigation and hydropower. The level of staff's qualification is likely to affect the type of information services provided to the users. Staff members working in the information centres are academically qualified with KPLC's records and archive and KenGen having staffs with Masters' Degree. Apart from TARDA, REA and KETRACO all other information centres indicated that funds allocated to them were sufficient to purchase the necessary materials and manage every function in the centres. Limited budget allocation is likely to affect the information resources and services available to the users. The Information centres expressed that required procurement process contributes to delays in acquisition of materials. This has a negative effect on timely availability of materials requested by the users.

7.6. Access and use of information resources

Addressing the second objective, which is to establish the access and use of information resources and services, the key informants of information centres stated that physical accessibility of materials is limited due to the various stations their users operate from. TARDA library is located in Industrial Area, Nairobi, and serves staff who are based in the Central Business District, Embu and Machakos counties. KenGen and all KPLC libraries have established online facility for online accessibility, use of emails, library brochures and magazines, among others. This reduces the constraints of information accessibility from the information centres.

7.7. Forms on adequacy of information resource sharing programs

In addressing the third objective, which was to determine the forms and adequacy of information resource sharing activities in the ESI sub-sector, the study showed that all information centres, none of the policies and guidelines used have a direct impact on information resource sharing. None of the information centres has a formal information resource sharing program in place. Most of them have an informal Information Resource Sharing (IRS) program with different partners. The KPLC Library, Training School Library and the KenGen Library have informal IRS programs that match their specific needs.

7.8. Access and use of information resources

The second objective, which was to establish the access and use of information resources and services, was addressed by the findings of the activeness of library users shown in figure 4.

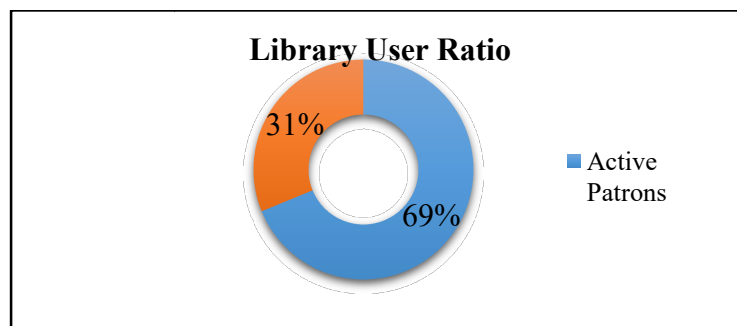


Figure 4: Library Active Users Ratio

A third of the respondents who stated that they were inactive patrons said that their inactiveness was due to lack of time. The respondents gave an average rating of their information centre facilities as 3.4 (68%), with audio visual equipment rated the highest at 3.75 (75%) and Reprographic services rated the lowest at 3.1 (62%).

7.9. Information Services

The respondents gave a rating on how they use the information services available shown in the below:

Library Services	Average Score	Percentage Rating (%)
Response rate & accuracy to inquiries	3.55	71
Awareness of new materials/services	3.5	70
Awareness of automated system	3.3	66
Accessibility and organization of materials	3.6	72
Communication to staff members	3.6	72
Average	3.5	70

Table 2: Information Services Rating

This study sought to establish the methods users preferred to access information services. The respondents used a variety of methods. The most popular method used by 49 (32%) respondents is physical visit to the centres while the use of the catalogue records is the least popularly used by 5(3%) respondents. 80 (32%) of the respondents indicated that they used the library facilities for study as 50 (20%) respondents indicated that they used the facilities for reading.

7.10. Interlibrary loans and accessing information from other parastatals

The study determined the awareness and use of interlibrary loan activities and how users access information from other parastatals in ESI as shown in and Table 4.

Status	No. of respondents
Aware of ILS	33
Unaware of ILS	147
No response	70
Total	250

Table 3: Interlibrary loan activities

Table 4 illustrates the scenario of users' thinking or attempts to access information from other parastatals within the same sector.

Scenario for ESI	No. of Respondents	Percentage (%)
Did not get information	12	5
Did not know how to access	51	20

They didn't think they would get assistance	25	10
Reluctant to ask	12	5
Scenario for ESI	No. of Respondents	Percentage (%)
No contact persons known	44	18
Did not need information	48	19
Other	20	8
Respondents of this question	212	85

Table 4: Accessing information from ESI sub-players

7.11. ICT use in Information resource sharing

The objective, which was to determine the extent of ICT use in resource sharing, was established from the findings in

Information Centres	IMS	Intranet
Training School Library	Koha	Library Intranet
GDC	Nil	Company Intranet
Olkaria	Module in SAP	Library Intranet
KPLC Executive Library	Koha	Library Intranet
KenGen	Module in SAP	Library Intranet
ERC	Amlib	Company Intranet
KPLC Records & Archives	RIM 360 ⁰	Company Intranet
TARDA	NIL	Nil

Table 5: IMS and Intranet

TARDA and GDC do not have or use IMS as TARDA also expressed that it did not have an Intranet. Intranets provides avenues for information sharing within the company.

The respondents were also invited to rate the adequacy of information accessed on websites of ESI and the results. The study revealed that the highest rate of accessibility is found in Kenya Power Website, which had the average rating of 3.9 (78%). KenGen website followed very closely with an average score of 3.85 (77%). TARDA scored the least with the average score of 1.85 (37%). The average rating for accessing information on these websites was 69%, a low rating in this era of information sharing and online presence.

7.12. Challenges experienced by ESI in information resource sharing

The fifth objective was to identify the challenges experienced by ESI sub-sector players in information resource sharing activities. Based on the findings the challenges included:

7.12.1. Poor marketing and publicity strategies identified in the information centres

There was no appropriate means of constantly communicating with those stationed in different regions was evident. Constraints in marketing and publicity activities emanated from constrained budgets.

Another challenge is that Information centres seemed to have a deficiency of reading materials caused mainly by the slow process of acquisition. Inconvenient access to information centres is a challenge most of the ESI players. Users who are based in other counties and regions are disadvantaged in accessing timely information due to distance and mode of transfer of information.

A glaring challenge is that collection development policies and acquisition policies are not fully implemented to ensure that the relevant materials are obtained and disseminated to relevant users. A common challenge that has been there over the years is that several staff members within the ESI sub sector have a tendency of withholding individual information within their departments, sections or offices, yet this information, could be useful to staff members in the same department, staff members in other departments as well as other ESI sub sector players. There is also the challenge of existence of invisible barriers. These barriers tend to work against accessing information centres in other parastatals. Funds allocated to information centres are often less than funds allocated to other departments. Departments that are deemed to be direct revenue generators often take the lion's share. A key challenge is that information centres have a tendency to place a low priority on information resource sharing activity.

7.12.2. The lack of users' awareness that information services exist in their organizations

For instance, they did not know of interlibrary loan services available for their use. By the time of this study, the information centres in ESI sub-sector seemed to operate in silos. According to the respondents, collaboration and networking among them did not appear to be a priority, which resulted in data inconsistencies and limited information coordination between the institutions. An unfortunate challenge is that some information centres do not serve all users equally as revealed by some respondents. They indicated that some users are given more preferences than others.

8. Recommendations

- Improving communication links: Information centres improve communication channels among them. It was suggested that all websites of the information centres be linked together or probably just share a common website platform.
- Updating content on ESI Websites: They sub-sector should upload relevant content, regularly updating information on the websites, having attractive user friendly websites and linking all the websites in this sector.
- Improve the marketing and publicity strategy: All the information centres should create awareness to their users, providing information on the available materials and services provided, including interlibrary loaning services, information on how the services can be accessed and information on new materials received.
- Training programs: There is a need to develop training programs to improve users' information seeking skills and empower them to use both the physical and virtual libraries within the shortest time possible.
- Managing bureaucracy: the numerous steps that are to be followed in parastatals and government departments often have the effect of derailing the processes of information dissemination and use. Information centres could address this challenge by creating and implementing information resource sharing policies.
- A Common collection development policy: It is inevitable for the information centres to have a consolidated plan of developing a common collection development policy that could serve the entire sub-sector.
- Networks and collaboration of information centres: Thus, the players could develop inter-firm alliances or corporate agreements between two independent players. This is initiated by having open discussions and initial meetings on the subject matter of information resource sharing.
- Develop policies and a framework for information resource sharing: The information centres could embark on designing policies that would facilitate information sharing among the players in the sub-sector. These policies can be designed by the information centre staff with the guidance of management.

9. The Framework

The Framework outlines a vision and mission of information resource sharing in ESI. It also links its vision and mission to the business strategy of ESI. The framework lists guidelines that shall be used when implementing the Information Resource Sharing Program in ESI. The guidelines:

- Provide definitions of key terms, concepts and principles of information resource sharing which will be applicable to the proposed information resource sharing program.
- Highlight the circulation policies and guidelines existing in each information centre so that each player is made aware of what they can access from other information centres.
- List steps in managing and maintaining databases that contain details of participating information centres in the proposed ESI information resource sharing programs. The details should include the interests of the institutions and the information they are ready to share with other players. This database should be stored and maintained by one of the players who is carefully and unanimously selected by the ESI players.
- Give direction to participating information centres on alternative locations of information of their interest.
- Provide sets of instructions on individual website designs that apply standards on the structure and content design on the web which in turn should facilitate collaborations when sharing information online.
- Provide details of ICT infrastructure to be acquired and used in each information centre to facilitate a successful information sharing program. The standards of interoperability of these systems should be clearly defined to ensure smooth execution of the program.
- Provide standards on establishing institutional repositories and ensuring each institution develops digital rights management to provide guidance on information exchange among the ESI players
- Draw the information resource sharing programs from information resource sharing policies developed and define specific roles for specific tasks.
- State agreed levels of permission to access types of information resources for accessibility by the information centres.

The framework shall be revised when need arises and when the corresponding policies on information resource sharing are reviewed.

10. Conclusion

The study revealed that there is availability of varied information resources and services, and that access to and use of information resources is not as extensive as it should be. It also revealed a lack of a formal program on information resource sharing and the inadequacy of informal resource sharing activities. It also showed that ICT use in information resource sharing is limited and identified the challenges of inadequate resources, users' unawareness of services available and limited networking among information centres. In conclusion, lack of a formal information resource sharing program in ESI negatively affects information services. Thus, a framework in information resource sharing which provides the structure and guidelines in establishing information resource sharing program in ESI has been developed and proposed for adoption in ESI. This is expected to impact positively on information services, thus improving the quality of services and products in ESI.

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