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Editorial

Knowledge is the primary resource for a vibrant society. Efficient utilization of existing knowledge can create comprehensive wealth of the country to improve the quality of individual's life. Ability to create and maintain the knowledge infrastructure, and develop knowledge workers to enhance their productivity through creation, growth and exploitation of new knowledge, are the key factors in deciding the prosperity of a society or nation.

In this regard, library and information resource centers in institutions of higher learning play an imperative role in facilitating creation and dissemination of new knowledge. Owning today's high-tech learning environment in respect of resources and their utilization, research services, digital scholarship, users' need assessment, content provider mergers, evidence of learning, new frameworks for information literacy, bibliometrics, scientometrics, webometrics, and open educational sources puts high emphasis on the role of Library and Information Science (LIS) professionals, academicians and researchers to investigate these areas and addresses the challenges effectively. Research in librarianship is a core aspect of library education worldwide. Consequently, it is the core responsibility of LIS academicians and practitioners to investigate the cause and effect of the phenomenon to come out with possible solutions. By implication, the advancement of any discipline is dependent upon the strengths, types, and outcomes of research carried out and how these findings are judiciously put to use.

Keeping in view the aforementioned challenges, an attempt has been made to provide a platform where LIS educationists, practitioners and researchers around the globe in general and particularly in Pakistan may publish their investigated challenges with best possible solution. The launching of a new peer-reviewed research journal namely 'International Journal of Librarianship and Information Science (IJoLIS)' is an outstanding initiative by the Department of Library and Information Sciences, Allama Iqbal Open University, Islamabad, Pakistan. The IJoLIS aims to (a) introduce best practices in modern librarianship to improve the current status, process, services and practices of library and information centers, and (b) optimize resource utilization and deliver high quality and value added research to end users. We are delighted to announce that the first issue of IJoLIS has been published, covering all five research articles from abroad. We warmly congratulate authors, and are extremely thankful to our international and local reviewers for their expert reviews, time and contribution. Their input was a pre-requisite in publishing this journal.

Effectiveness of Web Search Engines Using a Query Sample in the Field of Technology

*Sabha Ali**
*Sumeer Gul***

Abstract

Purpose -The study aims to provide a systematic evaluation of the select search engines on the basis of two information retrieval parameters, precision and recall.
Design/methodology/approach - The study preferred 'Web of Science' as a source to collect data (web queries) from top listed authors who have contributed in the field of Technology. Furthermore, search engines were selected on the basis of Alexa (Actionable Analytics for the Web) Rank. Alexa listed top 500 sites, viz., search engines, directories, social networking sites, and so on. But the scope of study is confined to only top two general search engines, viz., Google and Yahoo on the basis of language which is confined to English.
Findings - The study calculated the precision and relative recall of informational queries by using the top two general search engine known as "Google" and "Yahoo". Queries were selected from the top authors of web of science in the field of Technology and were divided into informational one-word, two-word, and three-word queries. Finally, it was revealed that the mean precision of search engine Google was (1.11) for informational queries and the mean precision of search engine Yahoo was (1.04) for informational queries respectively while as, Google attained highest mean relative recall with value of (0.85) followed by search engine Yahoo with (0.14).
Research limitations -The study tests retrieval effectiveness of only two general search engines and have only selected terms from the field of Technology.
Practical implications - Users should use Google as it provides better results for informational queries as compared to Yahoo. Google is able to

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provide more relevant information where a user can fulfill his/her information desire more efficiently and effectively.
Originality/value - This study shows the importance of search engines and their retrieval effectiveness particularly to informational queries where a user is looking for detailed information.
Paper Type – Research

Keywords - Search engines; Google; Yahoo; Effectiveness; Precision; Recall; Informational queries; Web queries.

Introduction

Web is an important part of our life where search engines are considered a paramount tool available nowadays by which users can search for the information which they desire to get online by giving their queries into a search engine (Kaur, Bhatia, & Singh, 2011). However, it has been seen that there exists a large number of search engines which are integrated with a multiple features like Google, Yahoo, Bing, AltaVista, and so on. Hence, the size of database of a search engine and the services which it provides to its users varies from one search engine to another (Oppenheim, Morris, Mcknight, & Lowley, 2000). Meanwhile it has been revealed that from last few years search engines have attained almost the same level of quality to some extend in terms of results which users get back while giving their queries to search engines (Dudek, Mastora, & Landoni, 2007). As search engines vary from one another in terms of searching interface, algorithm, features, and so on, it becomes difficult sometimes for a user to decide which search engine he/she should use to get more relevant results. Thus, three important techniques can be used by the users of search engines which can help them to distinguish one search engine from another, viz., "crawling reach, frequency of updates, and relevancy analysis" (Spink, Jansen, Kathuria, & Koshman, 2006). Search engines provide its users a number of search services like "web search, image search, audio search, video search" where users make use of web search the most as compared to other search services offered by the search engines. However, in all search engines basic search feature is same but special search features in all search engines are different from one another (Zhang, Fei, & Le, 2012). Introna and Nissenbaum (2000) highlight that search engines provide essential access to the web equally to those with something to

communicate and recommend and to those who are desire to discover (particularly information users). According to Mukherjea, Hirata, and Hara (1999) Google and Yahoo perform better in terms of retrieving textual information rather than retrieving image based information from the web. In view of Kumar (2012), search engines offers information in different forms like audio, video, text, and so on, which can be searched on one single information channel and most of the users adopt same strategies for retrieving text, audio, video information. However, users should be aware about the formulation of queries because queries play an important role while retrieving information from the web. A number of web queries can be divided into informational, navigational and transactional queries.

According to Kim and Carvalho (2011), queries can be identified in various categories with evidently diverse instability profiles which clearly point out that navigational queries are significantly more constant than non-navigational queries, while as longer queries (which are those queries that exceeds in length from six to ten words) are extensively less constant than shorter ones. In the context of query taxonomy, Jansen, Booth, and Spink (2008) classify queries in three-level taxonomies, viz., informational queries are considered as top most level, on the other hand navigational queries at the second level while as transactional queries at the bottom in this given taxonomy. Tann and Sanderson (2009) highlight that the linkage of navigational aspects with informational queries is a significant utilization of navigational queries because it shows that when a user submits a query as informational query he/she somehow expects that they will get a precise web site as their end result. Thus, these queries are basically informational queries having informational intent including a facet of a navigational anticipation and expectation (as cited in Kathuria, Jansen, Hafernik, & Spink, 2010). Informational queries are definitely paying attention on the user target of attaining information about the query topic because in this category both open and close ended questions are answered by the search engines (Broder, 2002).

Statement of the Problem

From last few years the concept of information retrieval has emerged tremendously which result in the effortless and quick discovery of information. Nowadays a huge number of people from every corner of world are engaged in creation, execution, dissemination of information and exploit that information by using different search engines. A huge

amount of information is available on the internet but it has become difficult for users to find the relevant information. The problem taken in hand evaluates the selected search engine on the basis of two parameters, viz., precision and relative recall taking into account informational queries and compare the retrieval effectiveness of queries on the basis of their frequency.

Objectives of the Study

1. To identify various informational queries in the field of technology given by top ranked authors of Web of Science (WoS).
2. To assess search engine competence and effectiveness based on various parameters.
3. To contrast retrieval effectiveness of search engine in terms of Precision and Relative Recall.

Literature Review

This section provides the review of literature pertaining to various aspects of search engines with particular reference to informational queries.

Green (2000) highlights the web emerging from a nascent stage and is evolving into a more multifaceted miscellaneous and structured environment. In the current era user's desire for information has become very important where users make use of different search engines to retrieve information from the web. Chowdhury and Soboroff (2002) state that a number of search engines exist nowadays and these search engines vary in their searching interface but some of the search engines are generally quite similar in terms of effectiveness and there exists a significant gap among the most excellent and poorer. As researched by Kumar (2012), users make use of search engines to achieve their information needs because most of the users view search engines as a basic tool for retrieving information where users get the results back from search engines. However, most of the users are not aware about the search strategies offered by search engines to assist their users in order to get the relevant results back and hence such users lack relevance in the results provided by search engines. Meanwhile, it has been seen that a number of users in the current era look for the information while using search engines frequently and only a very small percentage of users gaze for the information on the web rarely. In view of Kaur, Bhatia and Singh

(2011) one of the best tools available for seeking online information is a search engine which acts as a platform where the people can search for any kind of information. It has been revealed that most of the users make use of Google while looking for the information as it provides better interface, features and ease of use to the users as compared to any other search engine available. Dijck (2010) states that search engines have become vital creators of knowledge where knowledge is not only disseminated to its users but also manufactured by ranking system of search engines. Gonzalez-Caro (2011) analyzes the impact of the query intent in the search behavior of the users and observes that the distribution of the query intent along the topics diverge for each intent which is the intent of the query influences the associated topic of that query. Lewandowski (2012) highlights that a retrieval performance of search engines can be enhanced or improved by applying various quality factors like "index quality, quality of the results, quality of search features and search engine usability".

According to Kumar and Prakash (2009), there is a variation in search aptitude, user interface and also in the quality of information among two search engines, viz., Google and Yahoo. However, both these search engines get more relevant sites as compared to irrelevant sites when comparing with other search engines. It has been seen that a search engine Google make use of web graph and link structure to become mainly inclusive and consistent search engine. Bar-Ilan (2007) reveals that web is growing as everyday a number of web pages are added to it and thus sites are rising continuously. Hence, users adopt top general search engine called "Google" because of its enormous authority on the web panorama and thus users optimize their web pages to enhance and increase the rankings of the pages on Google. According to Liu, Zhang, Ru, and Ma (2006), it is very much difficult for the search engines to provide enough information when the length of query is shorter and thus users receive low quality result list. According to Moukdad and Large (2001), Spink, Wolfram, Jansen, and Saracevic (2001), users of search engines do not make use of sophisticated search features offered by the search engines and thus lacks the relevance among the results they get back while looking for any information. Furthermore, it has also been revealed that a large number of users utilize only a small number of search queries and thus scrutinize only a small number of Webpages. Maabreh, Al-Kabi, and Alsmadi (2012), in order to categorize queries as per needs of different users, build up an automatic method. With the help of this method, users categorize different Arabic queries in three types, viz., navigational, informational, and transactional. Broder (2002) reveals

that informational and navigational queries are well treated by the latest search engines and current search engines are appearing in the most efficient way to provide most relevant results to its users. Lewandowski (2011) found that the performance of two search engines, viz., Google and Yahoo is better as compared to any other search engine e.g MSN. Furthermore, while checking the retrieval effectiveness of these two search engines it has been revealed that in case of informational queries the execution of Google and Yahoo is better than any other search engine.

Methodology

The study is based on top two general search engines Google and Yahoo which are listed by the Alexa (Actionable Analytics for the Web) at the top among all search engines. Alexa listed top 500 sites, viz., search engines, portals, directories, social networking sites, networking tools, and so on. But the scope of study is confined to only top two general search engines, viz., Google which is ranked at 1 and Yahoo which is ranked at 2 among all other search engines on the basis of language which is confined to English. Furthermore, the study preferred 'Web of Science' as a source to collect data (web queries) from top listed authors who have contributed in the field of Technology (as per web of science categorization) across a period of 2000-2015. A total of 100 authors listed by Web of Science (WoS) based on their scientific productivity were selected for the period of 1st May, 2016 to 20th June, 2016. Search queries were selected from top cited paper of each author in their area of specialization. A total of 12 informational queries were collected in the field of Technology from WoS. Informational queries are basically categorized as those queries where a user is searching or looking for some detailed information on a particular topic.

Scope/Limitation

The scope of study is confined to only top two general search engines, viz., Google which is ranked at the position of 1 and Yahoo ranked at position 2 among all search engines listed by Alexa and the selection of queries was confined to the field of Technology.

Findings

Table 1 reveals that queries are classified in three categories, viz., "one-word informational queries, two-word informational queries and three-word informational queries" respectively. A total of 12 informational queries were selected from top authors listed by web of science in the field of Technology from the period of 1st May, 2016 to 20th June, 2016.

Table 1. *Query Frequency*

S. No.	Query intent	Occurrences	Percentage
1.	Informational (one-word)	5	41.66%
2.	Informational (two-word)	4	33.33%
3.	Informational (three-word)	3	25%
	Total queries	**12**	**100%**

Precision of Search Engines:

1. "If the web pages is related to the subject matter of the search query is grouped as "more relevant" and is given a score of 2.
2. If a web pages includes only some relevant ideas to the subject matter of the search query is grouped as "less relevant" and is given a score of 1.
3. If a web page is not associated to the subject matter of the search query is grouped as "irrelevant" and is given a score of 0.
4. If there is a web pages where a message appears "Links can't be accessed" that page is grouped as "site can't be accessed" and is given a score of 0.5".

According to Shafi and Rather (2005), the formula for estimation of precision of selected search engine for each of the search queries can be used as:

$$\text{Precision} = \frac{\text{Sum of the scores of sites retrieved by a search engine}}{\text{Total number of sites selected for evaluation}}$$

Table 2. *Precision for Informational One-word Queries*

Search query	Total sites retrieved		Sites selected for evaluation		More relevant		Less relevant		Irrelevant		Sites can't be accessed		Precision	
Q#	Google	Yahoo	Google	Yahoo	Google	Yahoo	Google	Yahoo	Google	Yahoo	Google	Yahoo	Google	Yahoo
1.1	12,600,242	96,700	20	20	8	7	5	6	7	7	0	0	1.05	1
1.2	8,764,300	253,000	20	20	8	7	6	6	6	7	0	0	1.10	1
1.3	14,600,000	791,000	20	20	9	8	5	6	6	6	0	0	1.15	1.10
1.4	16,432,000	6,810,000	20	20	8	8	5	5	7	7	0	0	1.05	1.05
1.5	98,700,000	55,500,000	20	20	7	6	6	7	6	6	1	1	1.03	0.98
Total	**151,096,542**	**63,450,700**	**100**	**100**	**40**	**36**	**27**	**30**	**32**	**33**	**1**	**1**	**1.07**	**1.03**

The mean precision for informational one-word queries in case of search engine Google was highest with precision value of 1.07 as compared to search engine Yahoo which attained precision value of 1.03. In case of Google, search query (Q 1.3) attained highest precision with (1.15) while as, the stumpy precision was obtained for search query (Q 1.5) with (1.03). However, in search engine Yahoo the highest precision value of 1.1 was observed for query (Q 1.3) and lowest precision of 0.98 value was attained for query (Q 1.5) respectively (Table 2).

Table 3 revealed that the results of Google and Yahoo for informational two-word queries. It is apparent from the table that overall precision of the Google for informational two-word queries is (1.11) and overall precision of Yahoo for informational two-word queries is (1.04). However, in case of Google the highest precision was observed for query (Q 2.2) and (Q 2.3) each with same precision value of 1.15 while as, in

search engine Yahoo the highest precision was achieved for query (Q 2.3) with precision value of 1.1.

Table 3. *Precision for Informational Two-word Queries*

Search query	Total sites retrieved	Sites selected for evaluation	More relevant	Less relevant	Irrelevant	Sites can't be accessed	Precision	
Q#	Google	Yahoo	Google	Yahoo	Google	Yahoo	Google	Yahoo	Google	Yahoo	Google	Yahoo	Google	Yahoo
2.1	164,300,000	2,990,000	20	20	8	7	6	7	6	6	0	0	1.1	1.05
2.2	12,846,400	3,590,000	20	20	8	7	7	6	5	7	0	0	1.15	1
2.3	18,676,000	15,600,000	20	20	9	8	5	6	6	6	0	0	1.15	1.1
2.4	23,432,000	69,700	20	20	7	6	7	8	6	6	0	0	1.05	1
Total	**219,254,400**	**22,249,700**	**80**	**80**	**32**	**28**	**25**	**27**	**23**	**25**	**0**	**0**	**1.11**	**1.04**

From Table 4 it can be seen that the overall precision of the Google for informational three word queries was (1.14) and overall precision of the search engine Yahoo was (1.05). In case of Google, search query (Q 3.1) and (Q3.2) attained highest precision with value of (1.15) and in case of Yahoo the highest precision was observed for query (Q 3.3) with value of 1.08.

Table 4. *Precision for Informational Three-word Queries*

Search query	Total sites retrieved		Sites selected for evaluation		More relevant		Less relevant		Irrelevant		Sites can't be accessed		Precision	
	Google	Yahoo	Google	Yahoo	Google	Yahoo	Google	Yahoo	Google	Yahoo	Google	Yahoo	Google	Yahoo
Q3.1	84,673,200	25,800	20	20	8	7	6	6	5	6	1	1	1.12	1.03
Q3.2	67,578,900	11,700	20	20	9	8	5	5	6	7	0	0	1.15	1.05
Q3.3	125,436,000	15,700,000	20	20	8	7	7	7	5	5	0	1	1.15	1.08
Total	**277,688,100**	**15,737,500**	**60**	**60**	**25**	**22**	**18**	**18**	**16**	**18**	**1**	**2**	**1.14**	**1.05**

Table 5 revealed for informational queries that the mean precision of search engine Google was (1.11) and Yahoo was (1.04), which is evident from the fact that the search engine Google provides better results for informational queries in comparison to Yahoo.

Table 5. *Mean Precision for Informational Queries*

Search engine	One-word queries	Two-word queries	Three-word queries	Mean Precision
Google	1.07	1.11	1.14	1.11
Yahoo	1.03	1.04	1.05	1.04

Relative Recall of Google and Yahoo

According to Shafi and Rather (2005), the formula for estimation of Relative Recall can be used as:

$$\text{Relative recall} = \frac{\text{Total number of sites retrieved by a search engine}}{\text{Sum of sites retrieved by a search engine}}$$

Table 6. *Relative Recall for Informational One-word Queries*

Search Query	Google		Yahoo	
	Total sites	**Relative Recall**	**Total sites**	**Relative Recall**
Q 1.1	12,600,242	0.99	96,700	0.01
Q 1.2	8,764,300	0.97	253,000	0.03
Q 1.3	14,600,000	0.94	791,000	0.05
Q 1.4	16,432,000	0.71	6,810,000	0.29
Q 1.5	98,700,000	0.64	55,500,000	0.36
Total	**151,096,542**	**0.70**	**63,450,700**	**0.29**

For informational one-word queries the recall was calculated and presented for search engine "Google" and search engine "Yahoo" in Table 6. The overall relative recall calculated for both Google and Yahoo was (0.70) and (0.29) respectively. In case of Google, the highest relative recall of (0.99) was observed for the search query (Q 1.1) followed by the search query (Q 1.2) with (0.97) relative recall value. While as, the lowest relative recall (0.64) was achieved for search query (Q 1.5). In case of Yahoo, search query (Q 1.5) attained the highest relative recall (0.36) and the least relative recall (0.01) was observed for search query (Q 1.1).

Table 7. *Relative Recall for Informational Two-word Queries*

Search query	Google		Yahoo	
	Total sites	**Relative Recall**	**Total sites**	**Relative Recall**
Q 2.1	164,300,000	0.98	2,990,000	0.02
Q 2.2	12,846,400	0.78	3,590,000	0.22
Q 2.3	18,676,000	0.54	15,600,000	0.46
Q 2.4	23,432,000	0.99	69,700	0.003
Total	**219,254,400**	**0.91**	**22,249,700**	**0.09**

The overall relative recall calculated for both Google and Yahoo for informational two-word queries was (0.91) and (0.09) respectively. In case of Google, the highest relative recall of (0.99) was observed for the search query (Q 2.4) followed by the search query (Q 2.1) with (0.98) relative recall value. While as, the lowest relative recall (0.54) was achieved for search query (Q 2.3). In case of Yahoo, search query (Q 2.3) attained the highest relative recall (0.46) and the least relative recall (0.003) was observed for search query (Q 2.4) in Table 7.

Table 8. *Relative Recall for Informational Three-word Queries*

Search query	Google		Yahoo	
	Total sites	**Relative Recall**	**Total sites**	**Relative Recall**
Q 3.1	84,673,200	0.99	25,800	3.04
Q 3.2	67,578,900	0.99	11,700	1.73
Q 3.3	125,436,000	0.88	15,700,000	0.11
Total	**277,688,100**	**0.95**	**15,737,500**	**0.05**

Table 8 showed relative recall of Google and Yahoo for three-word informational queries. The overall relative recall calculated for Google was (0.95) and overall relative recall for Yahoo was (0.05). However, the search engine Google achieved the highest relative recall of (0.99) for the query (Q 3.1) and (Q3.2) each respectively. While as, Yahoo attained highest relative recall for query (Q 3.1) with value of 3.04 followed by the search query (Q 3.2) with (1.73) relative recall value.

Table 9. *Mean Relative Recall for Informational Queries*

Search engine	One-word queries	Two-word queries	Three-word queries	Mean Relative Recall
Google	0.70	0.91	0.95	0.85
Yahoo	0.29	0.09	0.05	0.14

The mean relative recall of Google and Yahoo was (0.85) and (0.14) respectively for informational queries as seen in Table 9. Google had the highest mean precision (1.11) as well as the highest mean relative recall (0.85) followed by search engine Yahoo which attained mean precision value of (1.04) and mean relative recall of (0.14) respectively for informational queries.

Conclusion

Search engine is the most effective tool which can be used by the users while searching for any information and thus query analysis is an integral part of search engines. A huge number of search engines exist nowadays with the advanced features but still users are not satisfied with the results they get back and therefore, evaluation of these search engines is necessary to decide which search engine can provide better results. The study anticipated the precision and relative recall of two search engines

"Google" and "Yahoo" which are top two general search engines listed by Alexa ranking. The results revealed that the mean precision of search engine Google was (1.11) for informational queries and the mean precision of search engine Yahoo was (1.04) for informational queries respectively which is evident from the fact that the search engine "Google" provides better results for informational queries in comparison to search engine "Yahoo". The mean relative recall of Google for informational queries is high with value of (0.85) followed by Yahoo with (0.14). Google had the highest mean precision (1.11) as well as the highest mean relative recall (0.85) followed by search engine Yahoo which attained mean precision value of (1.04) and mean relative recall of (0.14) respectively for informational queries. It was observed that Google is able to provide more relevant and enhanced search results in comparison to search engine Yahoo and therefore, users prefer to use Google as the most efficient tool in order to retrieve more relevant results.

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Appendix 1: Informational Search Queries

1) **One-word queries**

   Q 1.1. Dzero

   Q 1.2. Excitotoxicity

   Q1. 3. Photoluminescence

   Q 1.4. Polymerase

   Q 1.5. Stroke

2) **Two-word queries**

   Q 2.1. Antimicrobial Effect

   Q 2.2. DNA Polymorphism

   Q 2.3. Gene Expression

   Q 2.4. Metal Dichalcogenide

3) **Three-word queries**

   Q 3.1. Poly Adp-Ribose Glycohydrolase

   Q 3.2. Tevatron Run Li

   Q 3.3. Two-Dimensional Materials

Stimulating and Enriching Partnership with Community Based Organizations: Inclusive Participatory Platform with Libraries in Nigeria

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Abstract

Purpose - This paper assesses the collaborative work of an information center with various Community Based Organizations (CBOs) in creating knowledge and innovative strategies for sustainable development in rural communities in Nigeria. It identifies the CBOs, explores the use of invited spaces in information dissemination and harnesses the inclusive participatory approaches for integrating libraries into CBOs' activities.
Design/methodology/approach - This is qualitative study. There were group discussions, brainstorming and physical assessment of facilities with CBOs, NGO officials and librarians. 120 participants were involved in the activities. Interviews were held with 24 group leaders.
Findings - Successful and effective partnership between information professionals and community based organizations can be achieved at the grass root. Identification with CBOs in their meetings opened innovations in community engagement which helped to form unique partnerships and networking opportunities for libraries. CBOs have human and knowledge resources that are useful in establishing knowledge management bases.
Research limitations - The study and results are based on rural CBOs in South East, Nigeria. There are various community based organizations in other societies that can impact on library activities and services.
Practical implications - This highlights the need to connect and engage with CBOs for effective information service delivery in order to remain relevant and survive in the competitive world of information platforms. If librarians continue to revel in the comfort of library buildings and relegate themselves to the background, they would deny themselves the global participation and social services to the communities.

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Originality/value - This is a unique study that shows practical engagement and collaboration in a real life environment that draws a model for information service development strategies.
Paper type - Research

Keywords - Collaboration; Community Based Organizations (CBOs); Inclusive participation; Library and information services; Invited space.

Introduction

It is no longer news that the world is moving towards strengthening mechanisms to enhance social development, community and economic growth. Libraries play critical roles in enhancing development because they are naturally involved with people which can easily create awareness for Community Based Organizations (CBO). This role was described by Lankes, Silverstein, and Nicholson (2007) as fostering greater decision and action on the topic of participatory networks and more broadly participatory librarianship. Hence, librarians can actually leverage on the communities' needs of livelihood, service deliveries, literacy, primary health care, water and sanitation, budget issues among others.

Librarians cannot pretend to be unable to channel development information to the needed groups, to help them manage their communities and raise their voices to be heard by duty bearers. Hence, the statement of "we are not social workers", "we only offer core services" by a class of librarians need to be revisited (Willimen, 2014). There is need for librarians who can interact and help people grow. The professionals who will employ practical strategies in engaging all segments of communities (Guzman, 2016) not just those that reflect their personal values and lifestyles but platforms that will reach out and key into community organizations.

This is about strengthening our communities because they are the heart of counties, states and nations, where families thrive (Convoy for Hope, 2015), where children are nurtured and raised, where able bodied men and women eke out their livelihood and participate in their sustainable development. It is then not out of place that librarians should commit to working with community based organizations in building strong communities. The confirmation of enriching our communities is emphasized in SDG 11 (UN, 2016) to make them safe, resilient and secure.

What better way of attributing to this objective than libraries and information centers collaborating with the communities, leveraging on created spaces to serve and become part of the functional groups. Based on this Krolak (2016) warned that when libraries develop their own, isolated literacy initiative, there is a danger that these efforts will be ignored by decision makers, and might not have the long- term impact in communities that libraries are hoping for. Here comes in the unequivocal essence of library to collaborate with CBOs through participatory strategies to build strong society. This study dwells more on the partnership between libraries and the culturally institutionalized CBOs in the rural communities in South East, Nigeria.

Statement of the Problem

Libraries are established to disseminate information for the well-being of the people and improvement of the society. They do not just collect books but also play important roles in a nation's cultural heritage with community organizations, churches and private organizations (Campbell, 2015) for improved service delivery. How many groups, communities, people both users and non-library users really know what libraries offer?

Although many people are synonymous with library and books, they need to know that they have good practices of supporting community based platforms through inclusive participatory approaches (Ballantyne, 2009). Community groups if well empowered will impact societal needs and make them function effectively like citizens with rights in their own countries. The class of librarians who believe that librarianship is not about getting mixed up with the locals but concentrate on "traditional core services" of meeting the needs of only those that come to the library should have a rethink just as Vincent (2014) queried, what really are the "core" and "non-core" services? This study examined the evidence based approaches of rural information services through inclusive participation of libraries and the community dwellers.

Objectives of the Study

The central objective of this study is to assess the collaborative and participatory activities of an information center with various community based organizations (CBOs). Particularly, the study sought to:

1. Identify the community based organizations in the pilot communities

2. Explore the use of invited and open spaces for engagement
3. Harness the inclusive participatory approaches for integration of libraries and CBOs

Literature Review

Community Based Organizations (CBOs) are recognized and acknowledged groups that play vital roles in community development with each group having primary functions in protecting the interest of its members (Ikwuba, 2010). In the same vein, National Network of Libraries of Medicine (NNLM) (2016) portrayed it as organization, public or private nonprofit (including a church or religious entity) that is representative of a community or a significant segment of a community and is engaged in meeting human, educational, environmental or public safety community needs. They are truly committed to community development and citizen participation. This is the reason they are in most rural communities made up of men, youth, women, Christian women, and so on (Ihem-Avoaja, 2013; Onyeozu, 2010).

Studies have shown that some libraries have collaborated with CBOs. One example was by Saumby and Fields (2016) who stated that Richardson public library collaborated with CBO on adult literacy and has celebrated 25 years of partnership. Others are Harris County public library on underserved populations in Houston and Dallas public library that supported communication between local literacy organizations, among others. Struck et al (2014) also reported that Rondo library in urban neighborhood in Saint Paul, Minnesota changed the ways in which community organizations collaborated and the ways adult team members of these organizations participated in the creation, partnerships and facilitation of the Createch workshops.

These are positive outcomes of collaboration with CBOs which have actually improved educational experience, community long life learning, health service deliveries, livelihood developments, civic involvement and demand for good governance (JDPC, 2014). Engagement with the CBOs has really provided the right conditions for generating the growth for more knowledge (Abegunde, 2009). The professionals now tap into key community (Regional Centers of Expertise (RCE), 2013) players that have already been created, seeking spaces in the regularly scheduled meetings and using it as a forum for disseminating information.

The need for awareness creation informs the massive utilization of communal assemblies for engagements. Hence, the available spaces were used. Spaces are referred to as openings and opportunities given to

people to express their views and create changes in their environment. The concept of 'spaces' for participation and how it links to strategic information services display the extent of leverage libraries can have in the communities. Usually, the "invited" and the "open" spaces participation (Aiyar, 2010; Mundy, Green, Lingard, & Verger, 2016) are what guarantee the ability of librarians to deal with issues in the communities. The library should seek and use these spaces in becoming development practitioner, facilitator and co-producer of information (Pateman, 2014), while identifying, prioritizing and meeting community needs. Indeed, when libraries mix up and provide meaningful community service-learning opportunities, more spaces will be created for them. It is worth all the engagement as Convoy of Hope (2015) pointed out, we may not be able to change the choices people make, but we can definitely increase the choices that they have.

Today, people want to participate. Perhaps, it is this assertion that led to inclusive institutions at all levels as part of sustainable development goals 17 (SDG 17) for different organizations to come together to partner for joint activities This goal recognizes the importance of focusing on common goals and common ambitions to strengthen communities through efforts (Sustainable Development Knowledge Platform, 2016). The indication is that librarians can actually collaborate with CBOs to improve their work, and not just merely to promote it. It is this change-oriented information and targets that will be communicated to groups, traditional rulers and marginalized community groups in response to the 2030 Agenda for Sustainable Development (Partnership for SDGs, 2016). Participation has become the key to open the closed doors to a more sustainable community.

It is only through inclusive participation that opportunities are given to people to contribute in situations that affect their lives. This positive change should be adopted (Olawepo, 2009) to fill the gaps in community groups' engagement. The libraries can now begin to create spaces to participate in strengthening our societies with common understanding and improving knowledge-sharing. Nothing benefits more than working together (Community Library Hub, 2011) because as the community learns from the librarians, librarians equally learn from the wealth of community knowledge, thereby creating knowledge hubs in improving social sectors. This will ensure the enjoyment of citizens' rights to participate and contribute in governance among others (Ndenje-Sichalwe & Ngulube, 2009). Transformation will come through this medium and change apathy into life-changing experiences in strengthening communities' resilience.

Methodology

This is a qualitative study. It focused on processes that can inspire change through inclusive participation with Community Based Organizations (CBOs) on Voice to the People's Project (V2P) in pilot communities in Anambra state. The project was funded by Department for International Development (DFID) United Kingdom with supports from Christian Aid Nigeria but implemented by Justice Development and Peace Commission (JPDC) an NGO in Onitsha, Anambra State. This study was carried out in the Igbo speaking communities of South East, Nigeria, covering eight local government areas where the thirty two pilot communities were chosen.

The Communities were visited severally during the course of the project so it was easy, stretching the interviews and meetings to fit into their traditional market days of gathering. One of the researchers, a librarian in charge of the NGO information center leveraged on the project management and created spaces for interested librarians as volunteers during the project life cycle. Thus, seven librarians (4 from public and 3 from academic libraries) participated in the project. 120 members of CBOs participated in the discussions with 30 participants from each community while 24 CBOs leaders were interviewed. The sample population represented all the four communities used in this study. All discussions were carried out in the local dialect which the team speaks with fluency and a little of Pidgin English. The findings were presented in tables and figure.

For this study, four out of the eight pilot local government areas (LGAs) (one community each from each LGA) were used to enable the researchers have a relative view of participation from May, 2014 - December, 2015. The LGAs were chosen because of their accessibilities to the communities facilities. The LGAs were Anambra East, Anambra West, Ayamelum and Idemili South with their communities: UmuobaAnam, Orometiti, Anaku and Akwaukwu, respectively. Data collection instruments used were:

I. Group discussions and brainstorming: These are meetings with CBOs done at different times and in different communities. It was moderated by the librarians and the NGO project teams to assess information needs. This approach helped the researchers to understand the socio-economic context of the residents. During brainstorming at the convenient locations found by the groups, different issues were raised with problem solving techniques. The participants were open and the researchers "learnt" from them.

II. Interviews: They were carried out with leaders of the CBOs to help establish and confirm the group discussions. The CBO leaders were randomly selected and consisted of male, female and youth,
III. Physical facility assessment: Some members of CBOs, librarians and the project team went round the communities to observe the schools, hospitals and water boreholes which accentuated the joint activities and solidified the cordial relationship among the participating groups.

These methods were chosen to reflect the inclusive participation of community groups. It also emphasized the collaborative activities of different organizations in carrying out joint activities, successfully.

Findings

Table 1. *Demographic Distribution of Participants*

CBOs	Age				Education			Sex	
	Below 18	18-30	31-45	46 and above	FSLC	WAEC	Higher degree	M	F
Youth Group	-	15	5	--	-	12	8	8	12
Women Group	-	2	10	8	4	8	8	-	20
Men Group	-	4	15	12	5	14	12	31	-
Religious Group	-	5	10	5	2	8	10	8	12
Others	-	10	12	7	-	14	15	17	12
Total	-	36	52	32	11	56	53	64	56

Table 1 shows that the number of male participants are higher than female participants at 64 and 56 respectively. Also shown is that majority of respondents age range falls between 31 and 45 with more participants possessing West African Examination Certificates (WAEC). There are also good numbers of participants with higher degrees with only 11 participants possessing First School Leaving Certificates (FSLC). Hence the demographic data shows the different statuses of CBOs groups.

Table 2. *Identification of the Community-based Organizations*

Sr#	Group	Composition	Interest
1	Youth:		
	OtuUmuagbo	Girls that are not married.	The well-being of members, empowerment
	Student union	Only students, usually in the tertiary institutions.	and support to livelihood.
	Youth general	All youth in the community (both girls and boys that are single).	Security and community development.
	Women:		
2	Umuada	Daughters of the community, married and non-married within or outside of the community.	Guidance, general wellbeing of members and households.
	Women wing of the Town Union	All married women in the community both indigene and non-indigene.	Welfare of women, improvement of basic amenities, empowerment, peaceful households and communities.
3	Men:		
	Town union	All males that are of reasoning age whether married or not.	Decision, policy making, security and general welfare of the community.
	Anambra State Association of Town Union (ASATU)	All President Generals (PGs) of the whole communities in the state.	Community development, security and empowerment.

Table 2 shows the existing various groups identified in all the communities studied. Each category has its distinct areas of responsibilities. It can be deduced that they all work towards one goal: development and sustainability of members and their communities.

The interview section with the CBO leaders revealed that the groups, especially the Umuada, Umuagbogho and the chiefs (community recognized titled men and women) have existed as long as the community. One of the leaders stated: *They are highly respected and their opinions are highly respected.*

Table 3. *Invited and Open Spaces used for Engagement*

Sr#	Group	Spaces/Opportunities for Discussion
1	Youth:	
	OtuUmuagbo	Monthly meetings at the community center/village hall.
	Youth general	Monthly meetings at the village hall.
	Student union	Meeting at the village hall during holiday.
2	Women:	
	Umuada	Meetings on the traditional market days (Eke, Orie, Afor and Nkwor) at the house of the eldest member.
	Women Wing of Town Union	Monthly meeting in a designated place (member's home or community hall) and annual August meetings in the community hall.
3	Men:	
	Town union	Meetings at the community Town hall.
	ASATU	Quarterly meetings at the local government Secretariat.

There are also the religious groups and the general groups that comprised of youths, women and men for community development purposes. These groups were revealed during discussion, indicating that their monitoring and reporting activities on government facilities have helped them to assess government policies and projects. Interviews also

confirmed this. Thus, it can be deduced that CBOs have interesting human and knowledge resources which can be useful in establishing knowledge management bases.

Table 3 shows locations and time of meetings of CBOs with the opportunities created to engage and disseminate information. Identifying with them in their meetings opened up new innovations in community engagements. Thus, trust and confidence were built here which hastened the forming of unique partnerships and networking opportunities for libraries.

Table 4. *Identification of Groups that have used the Spaces to Engage*

Who visits your Group?	**Participants**
Government people	Yes
Community Stake holders	Yes
Politicians	Yes
Church people	Yes
NGOs	Yes
Librarians	No
Clubs and Associations	Yes

Table 4 disclosed other groups that were given the same opportunities to engage the CBOs. This was discovered during discussion and interview sections. The participants informed that other groups have visited them to talk about issues but no one from the library has come. The interview revealed that everyone is accepted as long as what they are coming to say will benefit the members. The Town Union President stated: *We want the best for our people. We want people to bring information, empowerment and development to us.*

Table 5 shows the analysis of Community Based Organization (CBO) inclusion in charting sustainable framework for enriching the community. Participants supported each other in reaching a common goal as the table shows demarcation of outlined deliberate output for information sharing. This shows that successful and effective partnership for information services can be achieved at the grass root level.

Table 5. *Inclusive Participatory Approach*

Collaborative Activity	**Brain Storming Session**	**Tactical Approaches on Connecting with CBOs**
Joint assessment of needs by CBO, librarians and NGO	Targeted needs for strengthening and enrichment	Knowledge generation and analysis of issues; physical assessment of basic facilities.
Open dialogue	Participation and contribution of all participants	Mapping and prioritization of needs; community driven development strategy; identification of other groups for supports and sustainability.
Sustained communication and information services	Resource analysis	Dissemination of information, education and communication materials (IEC); best channel and medium of information dissemination; the use of social media.
Strategic framework	Work plan	Drawing of action plan for information engagement.

The figure 1 shows the evidence based insight into the joint participation with the CBOs. Three basic facilities were visited in the communities because they are constant in every area. The brief meeting with nurses and teachers were spontaneous but it helped in assessing the effective service delivery with the conditions of the facilities. Other things that followed were reports which they went back to share with their people while the researchers went back to plan the next strategy of dissemination. Here, community information is much more than farming and livelihood. Their quest for participation and contributions resulted in more research on civic education and literacy. Thus, a good sustainable relationship was built for more partnering activities.

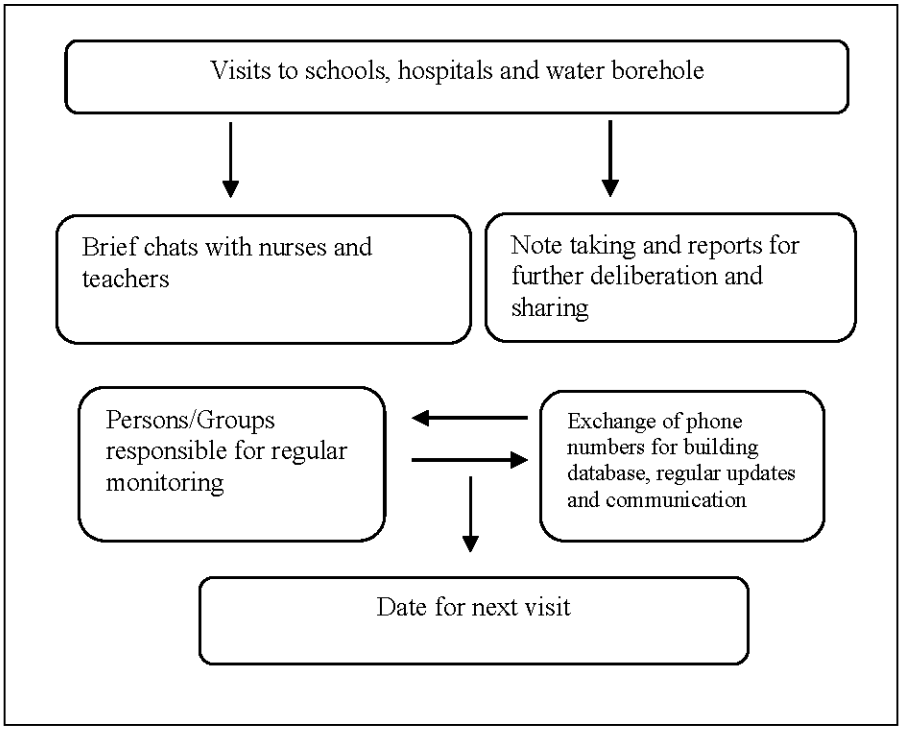

Figure 1. *Immediate output of inclusive brainstorming*

Discussion of Findings

It is obvious that Community Based Organization (CBO) cuts across every unit and represents the concerns of members of the community. The discovery that CBOs are made up of women, youth, men and religious residents show the social inclusion of every member of the community. The indication is that no one is left behind in enhancing community development prospects (Schareticles, 2014). Viewing it from that angle emphasizes the strength of CBOs and the reasons for libraries to understand the local issues in the communities. It further buttresses the assertion of Obeji (2015) that CBO has been part and parcel of every community in Nigeria. Since librarians are in the information business, this collaboration is good in developing plans and strategies for the needed outcomes.

This is the reason librarians must advocate and claim the spaces provided in Table 3, keying into the already existing community formal meetings (Regional Centers of Expertise (RCE), 2013), attending scheduled meetings and using them as platforms to disseminate relevant information. Of course, the librarians are accepted as other groups, which leave them with choices of making things happen with the CBOs through creating the relevance and synergy that will drive this knowledge. Hence, connecting with CBOs like other organizations in Table 4 will give visibility to the librarians as agents of information dissemination.

Inclusive participatory technique (Table 5) has shown that successful outcomes can be achieved with community dwellers and librarians. The joint activities of the CBOs, NGOs and the librarians with brain storming sessions produced open dialogue where innovations and strategies were worked out to everybody's benefits. That the approach revealed resource analysis, prioritization of needs, community driven development, distribution of IEC materials and drawing of action plan showed the extent knowledge can be generated and shared among partners. It also shows that CBOs actually know where and how to participate in helping to achieve their development with the right approaches of information services.

Evidently, the effect of the immediate outcome in Figure 1, aptly described what could be tagged breaking the silence of the poor and disadvantaged as it reflected the ambitions to strengthen communities through efforts as stated in SDG (Sustainable Development Knowledge Platform, 2016). This is the significance of value added and readiness of the dwellers to go beyond the group level and work for the whole community. It shows that collaboration sensitizes and motivates when combined with creative inclusive participation (INCLUDE, 2016).

It is pertinent to mention that the participatory exercise produced good results in Umueri community (Anambra East LGA) with a community member in Diaspora donating cartons of new books to twelve rural primary and secondary schools (Osuchukwu & Edewor, 2016). In Anaku, (Ayamelum LGA) there was immediate repair of leaking roof of the primary health center. There were also payment of the electricity bill of primary health center and repair of the leaking overhead tank of the community water bore hole by Town Union in Akwaukwu (Idemili South LGA). Also recorded were more enrollments in adult education sector in Orometiti (Anambra West LGA).

Conclusion/Implications

Stimulating and enriching partnership with community based organizations on inclusive participatory platform with libraries provided the following results: There are different types of CBOs that comprised of male, female and youths. They cut across traditional, church, social and gender groups that provide supports for their members and the community. In addition, these community groups made their meeting places and venues available and accessible for other groups to engage, indicating the readiness to work with any group that imparts wellness and development to their members. Participatory inclusive approach has shown to create impact in effective community information. The ease of partnering with CBOs and NGOs developed good working relationship and promise of continuous sustainable development.

The implication of this study is that if librarians continue to struggle with the description of mission of library without connecting with the users in their environment, other groups will replace their importance in the very communities their libraries operate. When this happens, they may face serious threats of extinction and possible removal from sustainable development goal platform. This study has shown that community groups can be connected with and accessed for partnership activities in library and information services. Every group can be penetrated in the community. Librarians must reach out beyond the people that visit their libraries alone.

Recommendations

Based on the findings, the following recommendations were made:

1. Libraries and information centers can adopt physical and social connections with CBOs. There is need to be open and communicate effectively.
2. Partnership with CBOs can start with building trust and respect from each party. It is not ideal to have a mindset of superiority when engaging community people.
3. Rural librarianship skills are needed because knowledge of local contents and confidence are part of information dissemination in the community.
4. Collaboration with NGOs and other groups who are already in the community network is important if librarians want to build strong relationship with the dwellers.

5. Participatory librarianship should be adopted and implemented in all communities

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Saudi University Library Websites: A Quantitative Analysis of the Contents

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Abstract

Purpose - The aim of this study is to carry out the content analysis of websites of Saudi Arabian university libraries from both public and private sectors. Another underlying objective is to understand and analyze the strengths and weaknesses of their services in the context of emerging needs of digital native.
Design/methodology/approach - This is a quantitative study carried out with a self-completion checklist of Saudi Arabia based 83 library website contents under nine major categories.
Findings - The results of study revealed a good number of web presence of the Saudi university libraries. The content coverage varies among the websites, few as excellent and others as poor. It is evident that Saudi university library websites are on their elementary phase of development if compared with their counterparts in developed and selected developing world.
Research limitations - This research only includes main/central library websites of Saudi Arabian universities and thus excludes other departmental or branch libraries.
Practical implications - This study explores strengths and weaknesses of the Saudi university library websites. The results are useful for the stakeholders to improve their websites to better serve their user community.
Originality/value - This study is first of its nature with perspective of (a) international web visibility of Saudi Arabia university library websites, and (b) comparing the required standards used by other higher education institutions in the region.
Paper type – Research

Keywords - Academic library websites; OPACs; Web 2.0; Content analysis; Widgets; Saudi Arabia; University libraries; Digital natives.

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Introduction

The Internet and web technologies created a new and unprecedented environment to governments, businesses, educational institutions, and individuals enabling them to webcast any information using multimedia tools (Lee & Teh, 2001). Websites are commonly used platform for any academic library. All the information, resources and services are woven around websites. Printed resources are mostly in use but the electronic resources are greatly in use by both the library professional and patrons since the arrival of handheld devices. Developing library website has become a common practice across the globe by the Higher Education Institutions (HEIs). Even if not a complete website, a static page consisting introduction about the library is available on the institutional websites. Websites consist of related web pages, images, video or other digital assets under a common uniform resource locater (URL), often comprising only the domain name, or the IP address, and root path in an Internet protocol based network (Kannappanavar, Jayaprakash, & Bachalapur, 2011). Websites are new face of today's library reference desks. In different studies, researchers gave many names to library websites i.e. face of library, windows to e-services, public face of library, virtual entrance, and a gateway to library (Aharony, 2012; Kaur & Singh, 2011; Mahmood & Richardson Jr, 2011; poll, 2007; Qutab & Mahmood, 2009).Whatever title is given, websites have become the most essential tool for the library existence in today's world.

Objectives of the Study

This study aims to:

i. identify the presence of public and private university library websites in Saudi Arabia (SA).
ii. appraise the current state of the university websites in SA.
iii. investigate the content strengths and weaknesses of these website.

Literature Review

There were many studies conducted on academic library websites content analysis around the globe. Some of these studies were limited to a single library website or a group of similar libraries. A quantitative and

qualitative analysis of academic library websites of Malaysia reported the stage of infancy in terms of contents and website design (Lee & Teh, 2001). The contents' analysis of university websites was conducted to review visibly uneven levels of library website contents of Pakistan during 2009 (Qutab & Mahmood, 2009). The benefits of developing library portals are: ease of searching multiple resources at single interface, simplified authentication i.e. reducing the barriers of multiple logs-on, unified presentation of quality resources, and personalization i.e. customization according to individual preferences (Cox, 2003). The library portals' study defined them as a personalized, customized and integrated information service to aggregate all kinds of library resources and services through a single access and management point for users (Masrek, Jamaludin, & Mukhtar, 2010). Another study of contents of academic library Websites in Rajasthan, India described them at better stage of designing and content strengths in 2010 (Pareek & Gupta, 2013). American academic library websites were reported as a wide difference in contents and design over 10 years from 2000-2010. They were viewed as becoming much sophisticated in design during 2010 than 2000 (Aharony, 2012). Academic library website development especially online catalogs became foremost priority in early internet age. Early 21st century research in LIS around the globe focused on Library OPACs' and their availability. Luong and Liew (2009) evaluated academic library OPACs of New Zealand. Mahmood (2008) studied library OPACs of Pakistan and enlisted their features. Wells (2007) viewed OPAC as one of the most desired web-based services by libraries.

Another research analyzed library home pages and considered them as most important part of the library website, describing them as face of the library. Authors stated that a well-designed home page leads the user to right resources. Although, there is visible difference of the home page presentation, design and contents among American, European and Asian countries' library website (Limoni, Ghiasi, & Razavi, 2012). Libraries are frequently using Web 2.0 tools for building a rapid communication with users. Web 2.0 integration into academic library websites was studied and concluded that these technologies provide potential benefits to academic libraries, and the role of librarians as facilitators of knowledge sharing, collaboration, and communication is becoming significant in the Web 2.0 environment (Lwoga, 2014; Raward, 2001). Another study that explained the use of widgets on the library websites claimed that chat and IM provide opportunity to communicate and respond to users 24/7 (Meier, 2008). Libraries use chat from bulletin board systems to enterprise virtual reference software but it has been

truly 'live' in recent past through the development of web applications and widgets which enable the chat interface directly within the web browser.

In recent years, academic library websites provide better and higher quality scholarly information than previous years, however, they face a competition in the area of user preferences. The massive growth of internet sources, new searching and sharing tools seem to provide users with power, ease and fun in information seeking (Aharony, 2012). Despite the various studies on website content analysis worldwide, still there is no comprehensive study that explains the status of university library websites in Saudi Arabia or Gulf countries. Saudi Arabia is one of the top technology adopting countries within their cultural and social context with an active community in virtual world since the availability of world's best technology in Arabic language and its cost affordability.

Higher Education in Saudi Arabia

The higher education system in Saudi Arab is similar to the educational system of the United States of America. However, the patterns and procedures of these educational systems have been adopted in accordance with Islamic systems, traditions and customs. Since 1975, the Ministry of Higher Education become a separate entity from Ministry of Education, with the purpose of dealing exclusively with higher education (Ministry of Higher Education, 2015). The Higher Education Council, Saudi Arabia (SA), is responsible for: directing university education in accordance with policy, supervising the development of university education in all sectors, coordinating among universities especially in the field of scientific departments and degrees, encouraging research, formulating rules and regulations for compliance by all institutions of higher learning.

University Libraries in Saudi Arabia

Higher education in Saudi Arabia has undergone a tremendous changes and growth over the last five decades. Consequently, a number of public and private sector universities has increased with more developed infrastructures, advanced teaching techniques, research and development resources, and main focus on the higher education. To produce quality graduates, national, regional and global accreditation standards were adapted to make local education at par with international

standards. This adaptability of change and development especially addition of online resources and their access to all Higher Education Institutions (HEIs) has also affected their libraries accordingly. First ever library consortia in Saudi Arabia "The Saudi Digital Library (SDL)" was introduced to share and support the teaching and research by providing access to international digital resources for all public sector universities. SDL also serves as a platform of the Saudi universities to negotiate with database publishers and Integrated Library System (ILS) providers to watch the interests of member universities. Such impactful initiative together with a series of successful implementations resulted in a handsome number of research articles produced by the local graduates and faculty. This output enabled Saudi HEIs to introduce new academic and research collaboration. Libraries, being active part of HEIs, emerge as main players in digital scholarship support, its conservation and sharing through institutional repositories. Standardized ILS, user-centered web presence, remote access option, and knowledgebase discovery tools entail salient features of Saudi university libraries in the virtual world.

Methodology

This study is conducted as a survey of university websites with a self-completion checklist. In first phase, university library websites were identified from the list of public and private sector HEIs as provided by the Saudi Higher Education Ministry website. There are 29 public universities and 27 private universities and Higher Education Colleges in SA (http://www.mohe.gov.sa/en/studyinside/Pages/default.aspx). During initial visit of the websites, it was revealed that all public HEIs (Pu) do have the library webpages (100%) but only 13 (48%) private sector HEI's (Pr) have library web pages. Survey checklist was developed with help of literature review, contents of some internationally ranked university library websites and preliminary survey of Saudi university websites. To compare the currency of library services contents and websites tools, some famous library website were selected through literature search. Review of these current and trendy universities library websites helped to add new era's contents into the checklist e.g. library guides, widgets, designs, use of famous vocabulary for access points, focusing user generated contents harnessing etc.

Based on the review of the literature, a checklist of 83 library website contents under nine (9) major categories is developed to do the analysis of the websites. Major categories were web site description;

accessibility and navigation; currency; website aids and tools; language and translation; library general information; library services; OPAC, e-resources and Web 2.0, Widgets and LibGuides. Since all the HEI's websites of SA are mainly in Arabic, therefore the content analysis was done simultaneously in both languages the Arabic and English, to identify the similarity or differences of the contents.

Findings

Websites are gateways to resources and services of libraries. They have comprehensive contents, descriptive details, and quick navigation to information, intelligent hyperlinking, use of visuals and the effective design ensuring swift use of the resources. However checklist helped in ranking the website on point basis as shown in (Appendix 1) despite the fact that user expectation about the library services website varies and depends on his/her high school education also i.e. some schools in Saudi Arabia have multilingual skills courses including Arabic and English.

Site Description

All library websites of Saudi universities have banners as page headers and graphics throughout webpages. Although, due to large size of the banners, often it is required to load and scroll down to view the contents. Another study indicated similar results, poor use of graphics at academic library websites in US during 2000 and good visuals and graphics on same websites during 2010 (Aharony, 2012). However with the provision new website development tools, multiple hosting options, limited size free web hosting, availability of open source softwares and free website template are gradually contributing to betterment of robust university libraries websites.

Accessibility, Navigation and Currency

It was revealed from the survey that all the HEI's library webpages' link was on homepage of HEI. Library webpages are mostly within three clicks from the HEI home page (Pu = 84%, Pr = 77 %) However, the tendency of finding library under "library" title was less in practice. Only 11 public sector HEI (Pu = 38 %) and 7 private sector HEI (Pr = 54%) have the "library" link on their home page. The public HEI's library links are enlisted under 'Deanships' and 'Deanship of Library Affairs'.

Table 1. *Accessibility, Navigation, and Currency (n=29 Public, 13 Private HEIs)*

Item	Public		Private	
	#	%	#	%
Library link on parent organization website homepage	29	100	13	100
Library webpage not more than three clicks from HEI homepage	28	96	10	77
Info about library under "Library" title	11	38	7	54
Info about library under "Deanship of Library affairs"	22	76	-	-
Info about library under different headings	5	17	6	46
HEI home link on every page of library webpages	23	79	9	69
Library home link on every page of HEI website	14	48	7	54
Website header banner	29	100	13	100
Use of graphics	21	72	10	77
Copyright information	22	76	10	77
Updating information	10	34	3	23
Under construction (few pages)	8	27	-	-

Other access points were academics, direct link, facilities, student's facilities, research, about us, and expanding knowledge. The HEI homepage links were present on most of library websites, although the library links on every page of the institutional website was not common. A major consideration in the design of academic library websites is the multiplicity of users and information needs that exist in the university environment. A library website requires an interface that can accommodate different needs, scholarly disciplines and capabilities of various and varied users within institution. The primary users within the university environment are not only academic staff, but also the librarians, administrative staff and students. The secondary user population comes from other academic institutions both nationally and internationally as well as from the wider population (Raward, 2001).

The currency of website contents is an important feature. It can be checked with the copyright date and updating information provided by the websites. A good number of website present their copyright dates.

However, updating information is given by rather less number of websites. It was also noted that some websites were going through their beta versions or were under construction, therefore, no such information is stated at all on the other hand navigation or redirection to old website is missing some times .

Website Aids and Tools

Mobile based web platform is the latest technology that is driving the users' community. Due to development of new technologies such as Apple, Android, users now have access to thousands of applications and apps (Cutshall, Bandy, & Blake, 2011). Similarly, users expect the library resources and services accessible via their handheld devices through mobile library websites (Kaur & Singh, 2011). The result of the study shows that website aids and tools including links to help users finding information within website e.g. site search, FAQs, site map, and so on. Some Saudi university library websites have provided these interactive aids to seek user feedback for service improvement. However, the provision of these aids including social media forums become one of the sources to benefit from users suggestions. These suggestions are analyzed by library social media team to harness the user-generated contents. They are also used in library annual report (see Table 2).

Table 2. *Website Aids and Tools (n=29 Public, 13 Private HEIs)*

Item	Public		Private	
	#	%	#	%
Feedback link	12	41	5	38
Site search	10	34	7	54
Frequently asked questions	6	20	3	23
Site map	9	31	2	15
Webmaster link	8	27	3	23
Website mobile app	6	21	1	8
User Opinion Polls	6	21	1	8

Library General Information

Library general information covers the library's administrative and operational functions. Nearly all the previous studies on library website content analysis studied the library's information on websites.

Table 3. *Library General Information (n=29 Public, 13 Private HEIs)*

Item	Public		Private	
	#	%	#	%
Library's Dean/ Chief's message	21	72	5	38
Library introduction	21	72	8	62
Library mission statement or objectives of library	22	75	8	62
Library policies & procedures	21	72	8	62
Library collections	15	52	10	77
Library committees	18	62	2	15
Membership information	17	58	5	38
Library branches	19	41	3	23
Library services	21	72	10	77
Annual reports/statistics	10	34	3	23
Chat with librarian	5	17	2	15
Hours of operation	19	65	10	77
Institutional repository	9	31	-	-
Instructions or tutorials about library use	13	44	4	31
Library department	15	52	3	23
Mailto facility to librarian/staff / staff directory	24	83	8	62
Newsletter	1	3.4	1	8
Ongoing / upcoming events	12	41	-	-
Floor plan, library map, video	4	14	1	8
Press release	10	34	1	8

This part is important for the accreditation agencies (local and international), peer organizations, users and LIS community. It is revealed that this section is strongest and structured in HEI library websites of Saudi Arabia. All the public library HEI websites show similar structure and contents e.g. message from the dean of library affaires, library introduction, mission statement, policies and produces, information about library committees, branch libraries, library services, library resources, annual reports, operational hours, library tutorials and library staff contacts. Library departments includes acquisition department, technical section, quality session, information literacy program, patron services, system department, administration and Finance, public relations unit, manuscript unit, gifts and exchange unit (see Table 3).

A couple of websites also describe the classification tools used by them. Some websites provide chat with librarian facility, library press release/ news, library newsletter, ongoing events, institutional repository, floor plan and important downloads. However, the private HEI's library websites were less inclined to provide this level information.

Figure 1. Alfaisal University Library Portal (Private)

Language and Translation

Arabic is the official language of Saudi Arabia. All the public and private HEI library websites are in both English and Arabic. King Abdul

Aziz university website is also in French and Spanish. The researchers viewed both English and Arabic pages to evaluate the contents in either language. It is discovered that at some points there is difference of contents among English and Arabic webpages.

Library Services

Services sections on the websites ranges from the text only to the hyperlinked pages for example some website with fill in page on website and some have link to external source or tool to do the same. It may cover the information or downloads There are online forms for information search request, 'ask a librarian', photocopy request form, library news alters, event calendars, new arrival lists, links to reference and research materials (other than institutional subscriptions), purchase request, library friends and book vendors links. On the other hand, private HEI's library websites show little of library services information specially history, vision, mission, and head of unit message. There is another trends found on these website that they use more image with bigger size rather than contents and their choice of social media forum are comparatively different from public HEIs. (See Table 4 & Figure 1 & 2).

Table 4. *Library Services / Technical Services (n=29 Public, 13 Private HEIs)*

Item	Public		Private	
	#	%	#	%
Information search request	11	38	3	23
Purchase suggestions	16	55	1	8
"Ask a librarian"	8	27	3	23
Request a photocopy	10	34	2	15
Library Friends	5	17	-	-
Library "news alerts"	17	59	5	38
Library events calendar	14	48	2	15
New-arrival section	11	37	2	15
Book vendors links	3	10	-	-

OPAC and E-resources

This study revealed that 21 (72%) public HEI libraries and 6 private HEI libraries (46%) provide access to their catalogues on their

homepage. The catalogues provide basic and advance search option, customized login for users, options to renew and reserve materials, new arrivals and purchase requests. Out of 29 OPACs only two institutions were using KOHA while all others were using SYMPHONY by SirsiDynix. It is therefore established that the OPAC searching options and features were same on 27 (93%) libraries websites. A very few libraries provide links to catalogues of other Saudi libraries as well as few international libraries like Library of Congress and British Library.

Online Public Access Catalog (OPAC) and e-resource portals are main and foremost resource of library knowledge discovery in the ICT age (Table 5). None of the advanced library websites in the world are without them. The user prefers a library website with a homepage directing them to the books, electronic resources including bourn digital or digitized, service librarians and internet resources (Limoni et al., 2012). Although, there are many alternative to information-gathering technologies in libraries but still OPAC is the Centre of library services (Wells, 2007).

Table 5. *OPAC & E-resources (n=29 Public, 13 Private HEIs)*

Item	Public		Private	
	#	%	#	%
OPAC	21	72	6	46
Links to other libraries online catalogues	6	20	3	23
Pass word protected e-resources	20	69	11	85
Access to list of e-resources without password	5	17	5	38
British Library Document Delivery	2	7	-	-
Saudi Digital Library	16	55	1	8
Internal sources	5	17	1	8
Links to manuals for e-resources	3	10	3	23
Links to search engines	3	10	3	23
Other databases	4	13	3	23
Professional journals/literature	1	3.4	3	23
Professional organizations	1	3.4	2	15
Reference tools list	2	7	3	23
Other reference sources (style guides, dictionaries etc.)	3	10	4	31
Library Research	2	7	1	8

E-resources have no substitute in present age. Saudi Digital Library (SDL) is a consortium for the public Higher Education Institutions (HEIs) to acquire and negotiate for the e-resources in SA. Many HEIs have also subscribed the databases other than provided by SDL. It was

revealed from the analysis of the library websites that most of the HEI have e-resources. However, they could not be reviewed as they were password protected. Only few HEI's libraries provided access to the list of e-resources. Some libraries websites also provide lists of free and open access online resources.

These resources include lists of search engines, professional and technical organizations, open access databases, reference tools and resources. It was found that trend to put a list of free and open access online resources is at infancy in Saudi library websites. It is possible that on the password protected webpages these links were present but cannot be analysis due to limited access. Although, most libraries in Saudi Arabia are using web discovery tools SUMMON for metadata search and access however lists of open access online resources are not discoverable through these search engine. In some libraries website this is in practice as "beyond the SUMMON" Search same as OCLC WorldCat help in locating resources metadata through their members libraries. A couple of websites also provide lists and links to the research conducted by library staff or about their library under heading of "library research". Digital scholarship services and their conservation is also one of emerging trends found on library website however open sources softwares are in trend and practice so they are still linked as external page to main website. DSpace is becoming more common in Saudi university libraries.

Web 2.0, Widgets and LibGuides

It is age of digital social networking especially the 'born digital' generation is more active and current in virtual world than physical environment. Libraries have already included many Web 2.0 applications in their websites (Mahmood & Richardson Jr, 2011). The Web 2.0 comprises a number of tools and technologies, ranging from wikis, blogs, and syndication feeds to social and virtual networking, however the use of RSS feed is most common among libraries (Lwoga, 2014).

This part of the questionnaire evaluated the Saudi HEI's libraries' presence on the Web 2.0. It was revealed that most of libraries were using Facebook, followed by Twitter, YouTube, Google + and RSS Feed. A couple of websites also directs to the LinkedIn, Digg and institutional forums links. Online tutorials were found on websites. Quick Response Code (QR codes) are also common on websites for the users with smart devices. Four (14%) public HEI's library websites provide their QR codes (Table 6).

Table 6. *Web 2.0, Widgets and LibGuides (n=29 Public, 13 Private HEIs)*

Items	Public		Private	
	#	%	#	%
RSS feed	3	10	-	-
Twitter	13	44	2	15
Facebook	13	44	3	23
Google +	6	21	2	15
YouTube	6	21	3	23
Digg	1	3.4	-	-
LinkedIn	2	7	1	8
Forum	3	10	-	-
Tutorials	7	24	2	15
QR Code	4	14	-	-
LibGuides	1	3.4	1	8

Library guides are the most important tool of today's library websites to engage user with specialized subject oriented contents support. Either these guides are simply as pdf and tutorials or Content Management and Curation System Platform such as Spring Share, LibGuides, and CMS. It was revealed that only one public HEI and one private HEI have developed CMS based LibGuides by acquiring Spring Share Library guides solution. However there are some open sources options are also available yet has to be explored such as subject plus.

Special Features

During this study some special features comes into account which were not covered under checklist.

- King Abdul Aziz University's library (Pu) website provide access to their World Digital Library (WDL) link, institutional forum, special needs collection and an option to praise the library services.
- King Faisal University library (Pu) website is more likely a portal. It also provides live coverage to their circulation desk.
- Yanbu University's library (Pu) website provide library emergency exit plan, list of softwares and hard wards available in the library and question of the month.

Figure 2. Difference of contents on Arabic and English webpages

- Imam Abdulrahman bin Faisal University (formally University of Dammam) library website (Pu) provides information about ILRC and liaison librarians program, detailed pages of branch libraries and citation resources.
- University of Dammam, Prince Sultan University and Almajmaah University's libraries (Pu) websites provide details of all the information.

- Jazan University, Princess Nora bint Abdulrahman University and Almajmaah University's libraries (Pu) provide open access to their video library, picture library and audio libraries.
- Almajmaah University's library (Pu) website holds an online survey to ensure the library services quality, Flicker account, brochures and Deanship of library affair's logo.
- Alfaisal University's library (Pr) website was only among private HEI's website to be detailed and interactive. It also has LibGuides CMS page link and it's structured as website 'portal'.

Conclusion

This study was first of its nature in Saudi Arabia. It reveals that the HEI's libraries websites are at infancy age of designing and in content extends. All the public sector HEI's libraries websites present information in similar format while may vary in level of the details. The information of library can be found under 'Deanship of Library Affairs'. This practice is different to international trends of providing direct link to the library however, it is commonly known practice among Saudi HEIs website structure.

Private sector HEI's library websites, apart from couple of cases, are out dated and old fashioned. There were many cases where only one static page was dedicated to the library information under facilities or resources' heading. E-resources are the strongest part of the library websites. Most of the website indicates presence of the e-resources within institutions. However, due to restricted access to e-resources' pages, these couldn't analyzed under this study. However, from personal experience of the researchers, it is known that the Saudi universities are acquiring lots of reputed databases across the range of subjects, including discovery tools like SUMMON with Off-campus access option to users through tools like EZProxy. Under-study websites were good in graphics but few were excellent in the selection of their color schemes and arrangement of texts. It was also apparent that many websites or parts of websites were in beta version or under construction. This indicates that these websites are going through continuous update process. Mainly all the websites were in Arabic but the English version was available. However, it was noticed that on few websites, the contents were different in both languages (see image 3). Interactive widgets like Web 2.0, and smart phone apps were also available on few websites. Social media forums like Facebook, Twitter and Google+

were most famous among the Saudi library websites. Online chat, email and message to librarian, facility was also observed in some websites. Overall few of the websites were quite good in contents and design while others were poor.

This study also revealed the quality and relevance of the Saudi HEI's library websites and information about available library services, their contents and designing, strengths and weakness. The Saudi young generation is a good user of ICT, active in virtual social world, familiar with big data emerging tools, confidant in application of information retrieval, tagging and sharing. Therefore, the library websites have an ample opportunity to attract emerging virtual community of young Saudis in competition to other service providers by adapting emerging socio-virtual platforms and tools, where they are mostly found. It is also a considerable fact every Saudi national is eligible to access any academic, special, public or national library without membership as per kingdom law however some services needs to be requested as per serving library certain rules for example to get book from university of Dammam library they have to deposit 500 SR (approximately 133 US Dollar) refundable security for book borrowing but they on the other hand scanning and guest internet services are free. However responding to various needs of local and expat academic community users, national peers and international scholarly community the Saudi academic library websites need to be more elaborative, multilingual and open to information sharing especially of the e-resources. Even a national level of e-resources ILL under umbrella of SDL members can be a good initiatives. Collectively, the adoption of technology in Saudi Arabia is at its zest now on the other hand Saudi academic institutions especially HEIs are working hard towards excellence in academia, research and sustaining the adapted international academic standards.

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Appendix 1

Table A1. *HEI's Library Website Ranking*

#	HEI	Status	URL	Points	Rank
1	King Saud University	Public	http://library.ksu.edu.sa/en/	74	1
2	University of Dammam/Imam Abdulraham bin Fasial University	Public	www.uod.edu.sa/DU/en/deanship/library_affairs/index.htm	69	2
3	Alfaisal University	Private	http://lib.alfaisal.edu/	69	2
4	King Abdulaziz University	Public	http://library.kau.edu.sa/Default.aspx?Site_ID=212&Lng=EN	68	3
5	King Abdulaziz University of science and technology	Public	www.kaust.edu.sa/kaust-library.html	67	4
6	Almajmaah University	Public	www.mu.edu.sa/en/deanships/deanship-library-affairs	65	5
7	Prince Sultan University	Private	http://info.psu.edu.sa/psu/library/index.asp	63	6
8	King Fahd University of Petroleum and Minerals	Public	http://library.kfupm.edu.sa/	61	7

9	Al Jouf University	Public	www.ju.edu.sa/endeanships/lib/pages/default.aspx	57	8
10	Yanbu University College	Private	www.yuc.edu.sa/index.php/library-homepage1	56	9
11	Umm Al-Qura University	Public	http://uqu.edu.sa/lib/en#	55	10
12	Qassim University	Public	www.library.qu.edu.sa/en/Pages/default.aspx	54	11
13	Taibah University	Public	www.ac-knowledge.net/taibah/	52	12
14	Princess Nora bint Abdulrahman University	Public	www.pnu.edu.sa/ar/Deanships/Libraries/Pages/Home.aspx	51	13
15	King Khalid University	Public	http://lib.kku.edu.sa/	50	14
16	Prince Sattam Bin AbdulAziz University	Public	www.psau.edu.sa/	48	15
17	King Faisal University	Public	www.kfu.edu.sa/en/Deans/Library/Pages/Home-new.aspx	45	16
18	Prince Mohammad Bin Fahd University	Private	www.pmu.edu.sa/Resources_Services/LRC_Library.aspx	42	17
19	Islamic University	Public	www.iu.edu.sa/endeanships/LibraryAffairs/Pages/default.aspx	40	18
20	Jazan University	Public	http://deanships.jazanu.edu.sa/lib/Pages/Default.aspx	33	19
21	University of Business Administration	Private	www.ubt.edu.sa/Library/About-the-Library	32	20
22	Najran University	Public	http://portal.nu.edu.sa/web/deanship-of-libraries-affairs	32	21
23	Dar Al-Hekma College	Private	http://sisweb.daralhekma.edu.sa:7779/portal/page?_pageid=357,142660&_dad=portal&_schema=PORTAL	31	22
24	Northern Borders University	Public	www.nbu.edu.sa/Pages/default.aspx	30	23
25	University of Tabuk	Public	www.ut.edu.sa/web/e-services/libraray	29	24
26	Taif University	Public	http://deanships.tu.edu.sa/en/DOL/Pages/default.aspx	28	25

27	Al Yamamah University	Private	http://yu.edu.sa/library/	27	26
28	Buraydah College for Applied Medical Sciences	Private	http://www.bpc-portal.com/lib	23	27
29	Shagra University	Public	www.su.edu.sa/English/Pages/default.aspx	22	28
30	Al Baha University	Public	http://portal.bu.edu.sa/web/14807978/home	21	29
31	Riyadh College of Dentistry and Pharmacy	Private	www.riyadh.edu.sa/page.php? PageName=Library	20	30
32	Naif Arab University of Security Sciences	Public	www.nauss.edu.sa/en/Pages/Home.aspx	19	31
33	University of Jeddah	Public	www.seu.edu.sa/sites/ar/Pages/main.aspx	17	32
34	Dar Al Uloom University	Private	http://dau.edu.sa/en/centers/lrc/what-we-do	16	33
35	Prince Sultan University for Tourism and Business	Private	www.pscj.edu.sa/AboutPSCJ/Library.aspx	15	34
36	Salman Bin Abdulaziz University	Public	www.sau.edu.sa/en/emada/251	15	35
37	King Saud bin Abdulaziz University for Health Sciences	Public	www.ksau-hs.edu.sa/English/Research/Pages/HealthSciencesLibrary.aspx	11	36
38	Almarifah College for Science and Technology	Private	www.mcst.edu.sa/	6	37
39	The Saudi Electronic University	Public	www.seu.edu.sa/sites/ar/Pages/main.aspx	6	37
40	University College of Jubail	Private	www.ucj.edu.sa/en/eservices/ Pages/Library.aspx	5	38
41	Al-Imam Mohammad Ibn Saud Islamic University	Public	www.imamu.edu.sa/en/libraries/Pages/default.aspx	5	38
42	University of Ha'il	Public	http://uohapp.uoh.edu.sa/eserv/e-services/index.htm	3	39
43	University of Hafarulbatin	Public	www.uohb.edu.sa/portal/en	1	40

Content-Based Image Retrieval Systems (CBIRs) Across the Globe: A Review

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Abstract

Purpose - Images form the human perception. The study aims to provide an overview of the Content Based Image Retrieval systems along with their peculiar features and modus operandi for retrieving the relevant images.
Design/methodology/approach – An exhaustive and extensive literature search was performed to identify the various Content Based Image Retrieval systems prevalent across the globe. A detailed search on several databases-Scopus, Web of Science was carried out for retrieving the related literature. The websites of Content Based Image Retrieval systems were also accessed to gauge the additional insights about a particular system.
Findings - A number of Content Based Image Retrieval systems have evolved over time, implementing the low level features such as texture, color and shape for the retrieval of images. However, to find the exact match for the users query Content Based Image Retrieval systems (CBIRs) should work at higher semantic levels to understand the meaning and context of the search queries for the efficient retrieval of images.
Research limitations - The study provides an overview of a number of Content Based Image Retrieval Systems (CBIR) without detailed account of technical architecture and evaluative frame work of each system.

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Practical implications - The study finds its implications for making a comparative assessment of different image retrieval systems based on image content. It will also be helpful for the users to select a system to retrieve precise images using content features of the query image.
Originality/value - The study is first of its kind to throw light on major content based image retrieval systems available across the globe.
Paper type – Review

Keywords - Image retrieval; Color; Texture; Shape; World Wide Web; Annotation-Based Image Retrieval (ABIR).

Introduction

"An image is called a digital image when a computer is able to read, store and display it. It is said to be formed from a set of dots termed as pixels which are stacked in a pre-set distribution of stakes and dins. Each dot or pixel is meant to describe a part of a particular image in a specific color or in any grey color's shade" (Getty Research Institute, 2000). With the advent of internet everything has changed from manual to digital so did the information retrieval processes which where earlier only the work of librarians, archivists etc. Internet and its smart child, "World Wide Web" [WWW] have revolutionized almost all the manual processes and has given life to the idea conceived by Vannevar Bush in 1945 of automatic information search, giving rise to various new forms of information retrieving one among them is image retrieval systems. The WWW has turned out to be a gigantic warehouse of visuals, different from the traditional archives as it is highly dispersed, plan less and negligibly indexed (Smith & Chang, 1997). Moreover, as latest tools began to make their inroads in the information retrieval sphere tools like multimedia- enabled web browsers, and smart phones images over the web got a hike as well, that flooded the web world with the image content resulting in the making of several image Information Retrieval systems to handle the image traffic over the internet as well as store the same (Goodrum, 2000). Automatic image retrieval started with Annotation Based Image Retrieval (ABIR) as a simple querying of databases that store image as textual records. The inspiration to use image content for retrieval emerged with growth in computational capabilities; further the idea of Content Based Image Retrieval (CBIR)

caught fascination of the computer science researchers due to performance dependence on the feature extracting and computer vision algorithms (Smeulders, Worring, Santinini, Gupta, & Jain, 2000). The query terms are linked with the filenames and the corresponding text to the image, if this matching doesn't work out, the text surrounding the image is employed for the retrieval. Ranking in this system is done on the commonness of the query terms and data linked with the image. At the time of retrieval process first of the web pages with less analysis of images are brought out and shown to the user (Lazarinis, 2010). There are currently two types of automatic image retrieval techniques based on textual retrieval termed as ABIR and other working on low- level features like color, shape and size of the images helping the efficient and speedy retrieval of the required images from the image hubs termed as CBIR (Inoue, 2009).

CBIR systems in addition to their advanced characteristics also provide the traditional search functions of text based search using the description or notations of the text embedded in the images and are considered as improvement over ABIR (Jansen, 2008).Image retrieval has recently caught attention of researchers and studies are done to evaluate image search engines particularly CBIR to improve their image retrieval effectiveness (Çakır, Bahçeci, & Bitirim, 2008).

The paper is an attempt to provide an overview of CBIR systems and their underlying features. It also discusses various systems using CBIR architecture for the precise and speedy retrieval of sought images.

Content-Based Image Retrieval (CBIR)

This is based on the description of low-level features that include color, texture, and shape, which are automatically extracted from the images themselves (Flickner et al., 1995). It highlights the accomplishments of the computer science and computer vision research communities that are meant to develop new methods and technologies that are superior and can easily tackle the problems or disadvantages of textual annotation of images represented by text based image retrieval systems. The number of such problems, disadvantages are considerable and prove fatal for the survival of textual annotation based systems (Enser, 2000). A general purpose CBIR system finds applicability in various areas like hosting a particular collection of images. There are many things that are to be taken into consideration while designing a CBIR system ranging from choosing the dimensions of feature vector, retrieval algorithm to be used, the process of final presentation of results

and the most important one i.e. selection of image features (Vassilieva, 2009). CBIR drafted on texture, shape and color features of the images, works by providing transitional results by differentiating the features one by one with all of the database images. The techniques of fusion and ranking are then applied to add up these transitional results to produce the most accurate final output for the query image (Park, Baek, & Lee, 2005). In a CBIR system, the image signals are analyzed on the basis of their visual contents, as colors, shapes and textures, which are also called as low-level features. The features can be gathered from the objects present in the images and their corresponding images that can be identified through the whole image or the objects present in them and are called as contents of the image, the images are sought by calculating the similarity in terms of these low-level features between a sought image and a set of images present in the database of the system, various feature extracting and similarity computing methods have been proposed (Lew, Sebe, Djerasa, & Jain, 2006). The methods of extraction for the low-level features of the images include the devising of algorithms which is sometimes difficult to formulate due to computational costs involved, once it is made then it can extract the low-level features (Inoue, 2004). The content-based image retrieval focuses on image indexing at the lowest level called as dot or pixel level and the search features based on pixel comparison and its implementation (Wang, 2000).

Here is the description of features used in the current approaches of CBIR.

Color

Searching images on the basis of color similarity is done by calculating a histogram for color on each individual image which then compares the pixel levels with the definite values that are termed as colors by the humans within the database images. Research in vogue for this feature is trying to divide color areas by specific areas and by three-dimensional association among different color areas (Carson, Belongie, Greenspan, & Malik, 1997).

Texture

It is hard task to represent perception of texture as concluded by the researchers. Checking of particular texture in a specific image is mainly done by displaying it as a plane of grey level variants. The comparative

glare of units of pixels is calculated in a manner so that the amount of regularity, coarseness, contrast, and the directions are computed (Tamura, Mori, & Yamawaki, 1978).

Shape

In order to use this feature for getting the accurate results, the queries are usually drafted by asking users to draw a shape or choose a shape from the examples of images returned by the system. In calculating the shape feature of the relevant image for the retrieval, a CBIR system uses a technique that computes boundaries, aspect ratio circularity and lines in the images, after this process the system checks for the regions of entropy or constancy by using edge detection and region growing techniques. The main problem encountered in using this feature is working with the images having touching or coinciding shapes (Goodrum, 2000).

The various prominent, advanced and currently in use CBIR initiatives/systems including web image search engines and online image databases across the globe are as:

QBIC (Query by Image Content)

Product of Almaden Research Center of the IBM one of the global leaders in techno innovation and development, it provides search using any mix of shape, texture and color with an added feature of search by keyword (Flickner et al., 1995). A palette, which is used to draft the queries for this system by giving an example query image or user has the freedom of drawing his query in the form of a sketch of an anticipated shape on the screen. After getting its query this smart system gathers and saves the low-level features of texture, color and shape from all the images of the system database (Faloutsos et al., 1994). QBIC then examines the query and each of the system database image is verified, most of the relevant results are then brought in front on the screen of the user as thumbnails. Newly released version of QBIC is preloaded with more intelligent indexing technique and incorporation of more user friendly interface has been also taken care of, wherein a user can look for the images in the grey level and an improved facility storyboarding of videos is also provided (Niblack et al., 1998).

Virage

Brain child of Virage, Inc. this system works in a pre- processing mode in which it smoothens and enhances the contrast earliest of gathering the features then the evaluation of color changes in hue and the dominant color, relative locations of colored areas in which the images with same amount of color, and color in same corresponding areas and images with same color are evaluated together, tint color space and color saturation, roughness, granularity and repetitiveness are also taken into account to denote the characteristic boundaries of varied shapes to calculate a structure value. This intelligent system also has a time driven facility for queries of video nature including, fades and wipes, scene breaks or cuts, dissolves, object discontinuities and object motion (Johansson, 2000). This efficient system runs as independent series module and as exiting management systems add-on feature. "More sophisticated product of the Virage Inc. is AltaVista's Photo Finder, which offers web users to get images by evaluating the content similarity" (Bach, et al., 1996).

Excalibur

A product evolved from a similar type of philosophy used by Excalibur Technologies, a name that produced Visual Retrieval Ware product using database applications (Feder, 1996). The system comes with different forms of image matching and indexing using the parent organisations owned pattern recognition technology. The product is available in the market as an applications development tool instead of a standalone retrieval software. This product was used by one of the giants of the web namely Yahoo for its image retrieving based on content of the images (Qawasmeh, 2002).

MARS (Multimedia Analysis and Retrieval System)

Product of University of Illinois's Beckman Institute for Advanced Science and Technology. The system is based on matching color, 3-D arrangement, shape and texture features and accepts queries based on the combination of these features including textual inscriptions as well with a scope for intricate queries that can be formulated using Boolean operators. Anticipated features for a user can be had from using an

example i.e. pointing to an image that has such features or selecting colors and textures from a palette provided by the system (Jeng, Li, Zhang, & Zhang, 2004). This system is based on the idea relevance feedback. It allows access to a variety of features and resembling measures and it learns by letting the user mark the images as highly relevant, relevant, no-opinion, non-relevant, or highly non-relevant (Johansson, 2000).

VIPER (Visual Information Processing for Enhanced Retrieval)

A product of University of Geneva's Computer Vision Group. Primarily matches color and texture based on one of the main and concept of primitives and calculating and distinguishing the low- level features. The VIPER Image Engine offers necessary tools that lead to the formation of a user interface by providing user facilities like image query, image insertion, inclusion of keywords, and support for several popular image file formats and weight adjustment for re-query. Another added feature is that of the query canvas, offering queries-by-sketch with the help of a bitmap editor wherein user can draw a sketch of the picture using the tools available for drawing and then coloring it by using the colors from the palette, besides this a user can edit an existing image on the canvas using the drawing tools. Queries are mainly based on the users choice of primitive combinations i.e. when two images are compared, a similarity score is calculated for each primitive in a specific query combination using distance function within that particular primitive (Gupta, 1997).

PhotoBook

Brain child of Media Laboratory, Massachusetts Institute of Technology a system for making searches in image databases computing the content in the images. The principle of working followed by this system is comparison making in the features associated with the images, and not the images itself. Parameter values of models fitted to images are actually the features, the models correspond to shape, texture and color, which are checked by making use of one from hub of matching algorithms incorporated in this system (Smith & Chang, 1997). Power driven annotation are used for the description of images, searcher descripts images and then system locates relevant images by comparing

the low level features and then descripts those images itself. "Four Eyes" is a new and most advanced system using feature combination, it takes a note of the user search behaviour and then uses that data to provide the user best matches by giving negative and positive images driven by the user relevance feedback mechanism (Johansson, 2000).

VisualSeek / SaFe (Spatial and Feature Query System)

An innovative image retrieval tool which lets the enquirer to formulate the queries by drawing 3-D patterns of areas of color, it then locates the most relevant images having the same areas of color as that of the query image. Before performing this process the retrieval system gathers and then adds descriptions to the images based on the color regions in the images. A great range of compound queries based on a mixture of color and distribution is computed by this intelligent system because it uses a proactive indexing technique for color region sizes and relative spatial locations (Smith & Chang, 1996).

WebSeer

A product of University of Chicago basically an image search engine having an image filled database of over three million. This system categorises images on their visual characteristics, innovative features of the system include face detector and multiple keyword search using the incorporated text including HTTP reference, page title or alternate text field of HTML reference (Frankel, Swain, & Athitsos, 1996).

Simplicity (Semantics-sensitive Integrated Matching for Picture Libraries)

Developed at university of Stanford, this system classifies images in a manner to semantically differentiate the expressive variances, e.g. Graph non graph, objectionable-benign, textured-non textured and indoor-outdoor (Wang, Li, Chan, & Wiederhold, 1999).

NETRA

A part of Alexandria Digital Library project made by University of California's department of Electrical and Computer Engineering, the database works on a pattern of classifying the images robotically into 6-

12 non- overlapping similar areas. This classification is done with the use of an edge flow algorithm that uses 'edges' in the features like shape, texture and color to denote the similar areas, and indexes these features individually. The scheme used for indexing brings in the use of dominant colors from the query image in order to chisel the color area (Ma & Manjunath, 1997).

PicSearch

A business enterprise created by Robert Risberg and Nils Andersson with a purpose to give web users an image search engine with high rate accuracy in a family friendly atmosphere, it helps its users to make use of wide range of visual assets of the internet ("Picsearch," 2015). This system is embedded with its in-house crawlers that crawls the web that creates a searchable directory of images. When a query is placed in this system by a user results are brought to him in the form of thumbnails which are classified in the order of their relevance with the query image, user clicks these thumbnail images and the system takes him to the original source where the image is hosted ("Picsearch," 2016).

AltaVista

Image searching engine with high rate of popularity stocked with a good number of advanced features whereby web surfers look for photos in black & white or in color. This system has a big back end database with almost 11.5 million images at its helm. It gives users the options of thumbnail viewing of images having print descriptions as well. Moreover, a user can make the use of its advanced search features to look deeply the sources of image (Qawasmeh, 2002).

Google Images

This search engine is the property of world leaders in web innovations and search engines namely google.inc, it processes the words that are nearby the image, image content is determined by the image capture method (Qawasmeh, 2002). It provides searching feature by search by image for conducting reverse image searches which enables it to provide an interface whereby the keyword typing in the search box is left out and the user searches the web by dropping in an image as the query. Results come as web results, pages with the image, different

resolutions of the image and similar images e.g. when a person makes a query using an image of any historical place, he may get the answers in the form of similar images or the description of the same monument or address of the webpages having the same monument picture ("Everything explained today," 2016).

Tineye Search

Tineye is a commercial image search engine made with innovative and customizable image finding solutions that uses image recognition and computer vision. The image recognition and retrieval are efficient and robust that helps in the fast and precise image searches to its clients. Moreover, the mobile searching facility is also provided by the company ("Tineye," 2016).

BING Images

Bing images is an online image search engine committed to provide its users the best accurate findings for their query images, offering an ease of access to the worthy content in terms of images, for which Bing automatically crawls the web to make an index of new as well as updated images in a manner to show most accurate results for a user- initiated search or action (Bing, 2016).

Yahoo (Picture Gallery)

This image search engine has an inbuilt bot that itself gathers and develops an index of the Images it offers the searchers an image browsing mode in different classes with an advanced feature of searching with color, furthermore a user is able to look for the images in the gallery (Qawasmeh, 2002).

World Wide Web Region-based Image Search Engine

It is a system made to access the World Wide Web content, for indexing purpose an advanced form of K-mean algorithm is stacked in the system. Making gathered regions as a base, specific features are accumulated using boundary information from the shape, color and texture.

The database stores the features with an extra bit of information like the URL place and index procedure's date. The searcher can use the

indexed content available on the web by making use of a smart user friendly interface. This system provides the output in the form of links to the content which are ranked to their relevance score to the query image (Ardizzoni, Bartolini, & Patella, 1999).

CANDID

Developed by Los Alamos National Laboratory, a distinguishing algorithm for browsing databases having digital images. The algorithm helps in the retrieval based on content of the query image using query by example methodology. The system allows a user to provide a query image in to the system, after that the similar images present in the database of the system are retrieved. The algorithm used in this system the features of shape, texture and color are computed using a signature for every individual image that is stored in the database. Signatures are matched using probability density functions of feature vectors (Kelly & Cannon, 1994).

Conclusion

The universe of images is continuously growing to a great extent with the technological advancements and expansion of the web. Information professionals and computer scientists have worked in close proximity to amalgamate the features of the images in order to devise such systems that can retrieve precise images from the ever expanding image universe. These efforts have led to the development of various image retrieval systems based on text ABIR and content CBIR of the images. However, difficulty in manual text tagging for a large database and its unavailability and inaccuracy in ABIR have resulted a rapid interest in the development of content-based image retrieval CBIR systems, which not only successfully managed image corpus over the web, but also increased the retrieval efficiency of images for the greater satisfaction of increasing number of user queries. At times, CBIR systems also provide text-based search functionality for notations and text descriptions embedded within images (Jansen, 2008).

In a CBIR system, the image signals are analyzed on the basis of their visual contents, such as color, shape and texture, which are called as low-level features. These features are extracted from the images and the objects present in them involving various feature extracting and similarity computing methods and devising of algorithms. However to

formulate algorithms is made difficult by the computational costs involved (Inoue, 2004; Lew et al., 2006). The advantages of CBIR are also limited by the usage of low-level features (texture, color, shape) which are unable to precisely perceive the meaning of queries, resulting in the Semantic Gap. The main question of addressing the semantic gap still remains a hurdle in the way of CBIR technology which can be explored further so that image retrieving will be based on semantics of the query and images. That will bring a new dawn in the field of image retrieving. There is a scope for future research involving evaluation of different CBIR systems using evaluative measures in different fields of knowledge showing most efficient image retrieval system for precise image searching in a particular field.

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Awareness and Abuse of Copyright by Undergraduates: The Oyo State's Experience

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Abstract

Purpose - As the journey to Marrakesh draws nearer, this study seeks to examine the level of undergraduate students' awareness of, and incidences of copyright infringement amongst selected Universities in Oyo State, Nigeria.

Design/methodology/approach - Descriptive design (six-part questionnaire) which was designed primarily to elicit information from undergraduate students of Ladoke Akintola University of Technology, Ogbomoso (LAUTECH), University of Ibadan, Ibadan and AjayiCrowther University, Oyo, all in Oyo State, Nigeria between the months of February and March, 2016 sought find out on the students' level of awareness on copyright and how they perceive copyright infringements. Simple random sampling method was used to select the respondents and the results analyzed using SPSS.

Findings - It was revealed that infringement of copyright has not yet been abated amongst the Nigerian undergraduate students. While a high percentage of respondents showed fair-knowledge of what copyright infringement is all about, it is ironical that lecturers actually collaborate with students in infringing on the intellectual rights of others.

Research limitations - The constraint faced had to do with the staggered nature of school calendar due to industrial actions and closure of the LadokeAkintola University of Technology and University of Ibadan. This affected the administration of the questionnaire to the extent that the questionnaire had to be administered much after it ought to have been administered.

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Practical implications - Copyright infringement may persist in Nigeria until much is done to squarely address the incidences of infringement in Nigeria.
Originality/value - This paper brings to the fore, the negative roles played by lecturers in encouraging copyright infringements. It further x-rays a paradigm shift in the mode of infringement from the print technology to the use of technology while also advocating a multi-sectoral copyright compliance model in fighting copyright infringements in Nigeria.
Paper type - Research

Keywords - Copyright infringement; Awareness; Technology; Undergraduate students; Nigeria.

Introduction

Globally, there is an increasing awareness on the need to protect the intellectual copyright of creators, authors and inventors. This is in the recognition of the fact that no state can comfortably remain an island in today's global village. Equally, more impact could be achieved when nations act in concert in the pursuit of the agenda to protect human creativity. In furtherance to actualizing this, nations met in Marrakesh, Morocco in November, 2016 to forge renewed commitment towards the protection of human knowledge hence the need to have up-to-date assessment of how campaign against copyright infringement has fared amongst undergraduate students in Nigeria.

Interestingly, copyright awareness is assuming prominence more than ever in Nigeria. This is not surprising considering the negative impact copyright abuse poses on the nation's economic landscape (Chikaodili, 2012). For Nigeria, an export-dependent nation with her income generation accruing mainly from her monolithic crude oil exportation in exchange for insatiable appetite for imported goods, her dwindling economic fortune in the last one year has made it imperative for Federal Government of Nigeria to diversify its economy, and to further block every form of leakages and wastages in the nation's resources as well as harnessing the nation's untapped opportunities in generating more funds.

Also worrisome is the cumulative effect of copyright infringement on the nation's economy as a whole. Besides the illicit reaping of the

labours of others, the government also denied the legal right to generate revenue from tax. Sadly, today in Nigeria, despite the expansion in her creative industry with her Nollywood as the second largest television industry in the world (Cinema of Nigeria, 2017), a survey conducted by Okwuke (2014) revealed that the Nigerian economy loses about 82 billion Naira yearly to software piracy alone, not to talk of other forms of infringements. Yet, the nation is financially bankrupt to the extent of not been able to pay salaries of her civil servants (Omoh, 2015).

If the creative industry is therefore well protected, the government can then make a giant leap in the income generation. This will also encourage copyright holders to produce more intellectual works that will be useful to their generations and humanity at large.

Objectives of the Study

The broad objective of this study is to examine the level of awareness, use and abuse of copyright by undergraduates in Nigeria. The specific Objectives of the study are to:

i. examine the level of awareness of copyright law among Nigerian undergraduates,
ii. identify ways through which the Nigerian undergraduates abuse copyright law,
iii. find out the methods used by undergraduates in infringing copyright law,
iv. identity where copyright infringements take place amongst undergraduate students, and
v. identify reasons why copyright law are not obeyed by Nigerian undergraduates.

Research Questions

1. To what extent are the undergraduate students knowledgeable on copyright law among undergraduates in Nigeria?
2. What are undergraduates' sources of information on copyright law?
3. What methods are used by undergraduate students in infringing copyright law?
4. Where do Nigerian undergraduates abuse copyright law?
5. What are the reasons why copyright law are not obeyed by Nigerian undergraduates?

Hypotheses

Ho_1 There is no significant relationship between awareness of copyright law and its abuse by undergraduates.

Ho_2 There is no significant relationship between knowledge of copyright law and its abuse by undergraduates.

Ho_3 There is no significant relationship between awareness of copyright law and reasons why copyright are not obeyed by undergraduates.

Literature Review

The need for man to protect its intellectual works is not a 21st century agenda. Research has revealed that its evolution can been linked with European invention as far back as the 15th century (Ishola & Oghenenyerhovwome, 2014). Nigeria's Copyright Law dates back to 1912, the period during which Nigeria was still under the leadership of the Great Britain. This relationship extended the coverage of the United Kingdom Copyright Act of 1911 to the Northern and Southern Protectorates of Nigeria via Order in Council, No. 912 of 1911 (Aboyade et al., 2015). The copyright regime has been subjected to series of reviews particularly, with the nation's political independence on October 1st, 1960. Currently, the Nigeria Copyright Act has been codified in the Laws of the Federation, 2004.

Copyright strives at protecting the result of intellectual creativity, thereby stimulating the creation of intellectual works of scholars which if not encouraged would adversely impact of human creativity and innovation (Aboyade et al., 2015). Copyright, as defined by the world's copyright apex body- World Intellectual Property Organization - WIPO (2014) is basically a legal term used to describe the rights of creators over their literary and artistic works. This protection is highly essential considering the fact that authors who have laboured so hard to write deserve to reap the fruits of their labour to the exclusion of others (Oyinloye, 2000).

The copyright protections which an author enjoys have been categorized into four by Cambridge as cited by (Alolade, 2014). They include:

i. The right to be identified as the author or creator,
ii. The right not to have a work subjected to derogatory treatment,
iii. The right not to have a work falsely attributed to the author, and

iv. The right of privacy of privately commissioned photographs and films.

These rights are well protected under the law such that anyone infringes on the any of the right can be punished under the respective laws governing protection of copyright. By the provision of the Nigerian Copyright Act, CAP C28, Laws of the Federation of Nigeria, 2004, copyright protection covers 'original literary, musical and artistic works, cinematography films, sound recordings and broadcast (Ekpenyong, 2015). These works ordinarily should not be reproduced without prior consent and approval of the creator of such works. But in reality, the reverse is the case in Nigeria. Oyinloye (2000) in his study shockingly discovered a growing culture of students and lecturers relying on photocopies, with lecturers selling handouts as substitutes for books, thousands of pages of author's works are photocopied daily without being paid for. Poverty is one of the reasons often attributed to this. For example, Ogunronbi and Bello (as cited in Isiakpona, 2012) found out that only 5% of students in higher institutions can afford to purchase textbooks needed for learning and research and as a result, these students tend to engage in the act of photocopying, thereby infringing on the copyright of the author. More recently, the internet Technological advances have enabled copyright pirates to steal more efficiently (Andrews, 2005).

The Nigerian Communications Commission (NCC) was established by the Nigerian Government to handle issues relating to copyright matters in Nigeria. While the commission has been making a number of efforts since its inception, there is still need for improvements (Andrews, 2005). The recommendations of Ngwang (1996) of two decades ago are still relevant even in the present age:

i. Efforts being made by NCC towards educating the public should also focus on issues like the use and importance of the banderole, the antompilar, the benefits of collecting societies and the damage caused by piracy.
ii. Intellectual property law should be as a matter of necessity by thought in all tertiary institutions in the country. The copyright law should possible be made either a core course or a compulsory course in relevant departments like Library Science, Information Science, Communication arts and the Department of Law, to name only a few. If this is done, it will be a significant advancement because it will have multiplier effect on the populace.

iii. Indigenous languages like Igbo, Yoruba and Hausa should be used to reach out to the masses during seminars and workshops. The Commission's Newsletters and foot bills should also be published in the local languages.

Methodology

The descriptive research design of the ex-post facto type was adopted in carrying out this study. Consequently, this study examines the relationship between the independent variable and dependent variable. The population of the studyis made up of students of Ladoke Akintola University of Technology, Ogbomoso (LAUTECH), University of Ibadan, Ibadan and AjayiCrowther University, Oyo, all in Oyo State, Nigeria. Simple random sampling method was used to select the respondents. The questionnaire administered randomly over the period of two months (60 days) between February and March, 2016 to the respondents who came to read at the Olusegun Oke library, West Reading Room, Kenneth Dike Library, Ibadan and TheophilusDanjuma Library in AjayiCrowther University, Oyo. The questionnaires were administered to respondents across the different levels of studies in their respective universities. The respondents range from freshmen herein referred to as 100 level students, down to graduating students who were either in 400 or 500 levels depending on their choice of courses. A five-point Likert scale was adopted so as to allow for degrees of opinions amongst respondents, thereby providing relative ease in the analysis of the quantitative data obtained from the study (McLeod, 2008). It should be noted that permission was sought and obtained from the respondents before the instrument was administered.

Scope of the Study/Limitations

This study centres on three tertiary institutions in Oyo State. The three institutions from Federal Government-owned University (University of Ibadan), State Government-owned University (LadokeAkintola University of Technology, Ogbomosho) and a privately-owned University (AjayiCrowther University, Oyo) represent the three modes of ownership of Universities in Nigeria. The institutions understudied are all located in Oyo State reputed as the pacesetter state in Nigeria. The paramount ruler-Olubadan of Ibadan land and the good people of Ibadan in their charismatic manner warmly embraced the ideals

of western education and as a show of support for the proper take-off of the University in 1948 had magnanimously leased for a period of 999 years, the entire land upon which Nigeria's Premier University -the University of Ibadan. LadokeAkintola University of Technology started operations in 1990 while AjayiCrowther University was awarded the operation license on January, 2005.

The choice of the having Universities ranging from private to public institutions is intended to have a balanced view considering the fact that a number of students from privately-owned institutions may actually come from relatively more comfortable family backgrounds and as such:

- could be better educated on copyright issues, and
- might have high purchasing power which should discourage them for engaging in copyright-induced infringement. Nevertheless, the study captures the opinion of persons from publicly-owned institutions as well.

Findings

Table 1. *Demographic Profiles of the Respondents (N = 300)*

University	**Frequency**	**Percentage**
AjayiCrowther	100	33.3
LAUTECH	100	33.3
University of Ibadan	100	33.3
Sex	**Frequency**	**Percentage**
Male	175	58.3
Female	125	41.7
Age	**Frequency**	**Percentage**
16-20 years	85	28.4
21-25 years	172	57.3
26 above	43	14.3
Level of education	**Frequency**	**Percentage**
100 Level	58	19.3
200 Level	58	19.3
300 Level	67	22.3
400 Level	84	28.0
500 Level	33	11.0

Table 1 shows the demographic profile of the respondents. Each university has equal participation of 100 respondents. The result by sex

of the respondents shows that male participants are more than the females. On the age of the respondents, 57% fell between the ages of 21-25 and are the highest, followed by 28.4% respondents who fell into age bracket 16-20years. The level of education of the respondents revealed that 28% respondents were in 400 level, 22.3% were in 300 level. It should be noted that 500 level student were the least on the table.

Research Questions

Table 2. *RQ 1. What is the level of Undergraduate Students' Awareness on Copyright?*

S#	Items	UD	SD	D	A	SA	Mean	SD
1	Copyright is the exclusive right given to an author of a particular work to have exclusive right on the reproduction and redistribution of the work	8 2.7 %	1 .3 %	9 3.0 %	85 28.3 %	197 65.7 %	4.54	.81
2	It is unlawful to use someone's original work to make profit without the holder's permission	3 1.0 %	9 3.0 %	12 4.0 %	84 28.0 %	192 64.0 %	4.51	.79
3	Electronic works like C.Ds and DVDs are part of works protected under copyright	3 1.0 %	1 .3 %	12 4.0 %	116 38.7 %	168 56.0 %	4.48	.69
4	There are laws in Nigeria and overseas to protect author's right	-	2 .7 %	19 6.3 %	122 40.7 %	157 52.3 %	4.45	.64
5	The copyright holder may be corporate body/organization	10 3.3 %	3 1.0 %	13 4.3 %	127 42.3 %	147 49.0 %	4.33	.88
6	Someone who disobeys this law may be punished under the law	9 3.0 %	6 2.0 %	15 5.0 %	119 39.7 %	151 50.3 %	4.32	.90
7	It is against the author's right when his/her work is used without his/her permission	2 .7 %	20 6.7 %	23 7.7 %	98 32.7 %	157 52.3 %	4.29	.92
8	Copyright extends even after the death of the copyright holder	9 3.0 %	9 3.0 %	19 6.3 %	123 41.0 %	140 46.7 %	4.25	.93

Undecided (UD); Strongly Disagree (SD); Disagree (D); Agree (A); Strongly Agree (SA); Standard Deviation (SD)

Research question one sought to elicit information on the level of awareness of the participants on Copyright law. That copyright is the exclusive right given to an author of a particular work to have exclusive right on the reproduction and redistribution of the work (mean = 4.54) ranked highest in the mean score rating. This was followed by assumption that it is unlawful to use someone's original work to make profit without the holder's permission (mean = 4.51); Electronic works like CDs and DVDs are part of works protected under copyright (mean = 4.48); There are laws in Nigeria and overseas to protect author's right (mean = 4.45) and that copyright holder may be corporate organization (mean = 4.33).

On the other hand, (mean = 4.32) was of view that someone who infringes copyright law may be punished under the law. (Mean = 4.29) maintained that it is against the author's right when his/her work is used without his/her permission. That copyright extends even after the death of the copyright holder ranked mean = 4.25 and that one could make photocopy of a whole book when need arises, (mean = 3.73).

Table 3. *RQ 2. What are the ways through which students' learn on incidences of copyright abuse?*

S#	Items	UD	SD	D	A	SA	Mean	SD
1	Through the activities of the copyright society of Nigeria (COSON)	22 7.3 %	17 5.7 %	29 9.7 %	128 42.7 %	104 34.7 %	3.92	1.15
2	Through the Library/Librarian	44 14.7%	3 1.0%	26 8.7%	96 32.0%	131 43.7%	3.89	1.37
3	From the newspaper	48 16.0 %	27 9.0%	52 17.3%	87 29.0%	86 28.7%	3.45	1.40
4	Through radio jingles and advertisement	55 18.3 %	50 16.7 %	32 10.7 %	87 29.0 %	76 25.3 %	3.26	1.46
5	Orientation in school	34 11.3%	67 22.3%	60 20.0%	94 31.3%	45 15.0%	3.16	1.25
6	Through someone punished for infringement	67 22.3 %	63 21.0 %	29 9.7 %	74 24.7 %	67 22.3 %	3.04	1.50
7	Through T.V. Broadcasts, jingles and advertisement	55 18.3 %	73 24.3 %	47 15.7 %	65 21.7 %	60 20.0 %	3.01	1.14
8	While surfing the net?	46 15.3%	72 24.0%	83 27.7%	64 21.3%	35 11.7%	2.90	1.24
9	Through peer education	47 15.7%	91 30.3%	81 27.0%	52 17.3%	29 9.7%	2.75	1.20

The focus of research question two was to research into the sources of information on copyright law. The findings reveal that the activities of the Copyright Society of Nigeria (COSON) (mean = 3.92) ranked highest by the mean score rating and was followed by orientation from the Library/Librarian (mean = 3.89); newspaper (mean=3.45); radio jingles and advertisement (mean = 3.26); orientation in school (mean = 3.16); through someone punished for infringement (mean = 3.04); T.V. Broadcasts, jingles and advertisement (mean = 3.01); while surfing the net (mean = 2.90) and lastly by through peer education (mean = 2.75).

Table 4. *RQ 3. How do Students perform the activities of copyright?*

S#	Items	UD	SD	D	A	SA	Mean	SD
1	Photocopying of textbooks and scanning of documents	39 13.0 %	11 3.7 %	20 6.7 %	103 34.3 %	127 42.3 %	3.89	1.34
2	Through unauthorized internet downloads	41 13.7 %	13 4.3 %	43 14.3 %	78 26.0 %	125 41.7 %	3.78	1.39
3	Others	51 17.0 %	7 2.3 %	20 6.7 %	116 38.7 %	106 35.3 %	3.73	1.41
5 4	Burning/writing of CDs and DVDs on empty or rewritable discs or transfer of borrowed discs on their computers	46 15.3 %	5 1.7 %	41 13.7 %	112 37.3 %	96 32.0 %	3.69	1.356
5	Using published works without acknowledging the authors	46 15.3 %	13 4.3 %	46 15.3 %	99 33.0 %	96 32.0 %	3.62	1.37
6	Complete reproduction and reselling of copyright items	136 45.3 %	10 3.3 %	17 5.7 %	54 18.0 %	83 27.7 %	2.79	1.76

The methods used by culprits of copyright infringement include photocopying of textbooks and scanning of documents (mean = 3.89); unauthorized internet downloads (mean = 3.78); burning/writing of CDs and DVDs on empty or rewritable discs or transfer of borrowed discs on their computers (mean = 3.69); using published works without acknowledging the authors (mean = 3.62) and complete reproduction and reselling of copyright items and lastly by (mean = 2.79).

Table 5. *RQ 4. Where do students perform the activities above?*

S#	Items	UD	SD	D	A	SA	Mean	SD
1	Through friends and families who have these gadgets	29 9.7%	5 1.7%	24 8.0%	119 39.7%	123 41.0%	4.01	1.20
2	Through personal scanning machines	35 11.7%	1 .3%	16 5.3%	133 44.3%	115 38.3%	3.97	1.23
3	Using personal computers or laptops to rewrite/copy discs	36 12.0%	4 1.3%	44 14.7%	124 41.3%	92 30.7%	3.77	1.24
4	From business centres around and outside the campus	38 12.7%	3 1.0%	36 12.0%	139 46.3%	84 28.0%	3.76	1.24
5	Others	48 16.0%	23 7.7%	25 8.3%	85 28.3%	119 39.7%	3.68	1.46
6	Through the internet	50 16.7%	18 6.0%	44 14.7%	99 33.0%	89 29.7%	3.53	1.40
7	People actually go to printing press to pirate printed materials	125 41.7%	21 7.0%	25 8.3%	78 26.0%	51 17.0%	2.70	1.61

Responses as where the unlawful act of copyright infringement is down include acts done through friends and families who have requisite gadgets (mean = 4.01) ranked highest by the mean score rating and was followed by activities performed through personal scanning machines (mean = 3.97); using of personal computers or laptops to rewrite/copy discs (mean = 3.77); from business centres around and outside the campus (mean = 3.76); through the internet(mean = 3.53) and lastly by people unscrupulous elements who fraudulently go to printing press to pirate printed materials (mean = 2.70).

Table 6. *RQ 5. What are the reasons why copyright are not obeyed?*

#	Items	UD	SD	D	A	SA	Mean	SD
1	Some lecturers are collaborators	39 13.0%	10 3.3%	23 7.7%	110 36.7%	118 39.3%	3.86	1.33
2	Ignorance	43 14.3%	11 3.7%	26 8.7%	123 41.0%	97 32.3%	3.73	1.33
3	When the materials are not easily come-by	39 13.0%	14 4.7%	37 12.3%	121 40.3%	89 29.7%	3.69	1.30
4	Poverty	36 12.0%	27 9.0%	31 10.3%	112 37.3%	94 31.3%	3.67	1.32
5	The cost of books/other materials	48 16.0%	14 4.7%	44 14.7%	92 30.7%	102 34.0%	3.62	1.41
6	It is the problem of piracy	170 56.7%	13 4.3%	20 6.7%	43 14.3%	54 18.0%	2.33	1.65

The findings reveal that some lecturers are actually collaborators in the act of copyright infringement (mean = 3.86); ignorance (mean = 3.73), unavailability of the material (mean = 3.69); poverty (mean = 3.67); cost of books/other materials (mean = 3.62) and lastly, the problem of piracy (mean = 2.33).

Ho_1: There will be no significant relationship between Copyright Abuse and Awareness on Copyright.

Table 7. *Significant relationship between Copyright Abuse and Awareness on Copyright*

Variable	Mean	Std. Dev.	N	R	P	Remark
Copyright Abuse Awareness on Copyright	25.6833 38.7733	7.1806 4.6534	300	.132*	.000	Sig.

- *Sig. at .05*

It is shown in the above table that there was a positive significant relationship between Copyright Abuse and Awareness on Copyright ($r = .132$, $N = 300$, $P < .05$). Null Hypothesis is rejected.

Ho_2: There will be no significant relationship between Copyright Abuse and Students' Knowledge about Copy Right.

Table 8. *Relationship between Copyright Abuse and Students' Knowledge about Copyright*

Variable	Mean	Std. Dev.	N	R	P	Remark
Copyright Abuse Students' Knowledge about Copy Right	25.6833 28.5567	7.1806 7.5918	300	.486*	.000	Sig.

- *Sig. at .05*

It is shown in the above table that there was a positive significant relationship between Copyright Abuse and Students' Knowledge about Copyright ($r = .486$, $N = 300$, $P < .05$). Null hypothesis is rejected.

Ho_3: There will be no significant relationship between awareness on copyright and the reasons why copyright laws are not obeyed.

Table 9. *Relationship between Awareness on copyright and Reason why Copyright are not obeyed*

Variable	Mean	Std. Dev.	N	R	P	Remark
Awareness on copyright Reason why Copyright are not obeyed	38.7733 24.5800	7.6534 6.7727	300	.041	.479	Not sig.

It is shown in the above table that there was no significant relationship between Awareness on copyright and Reason why Copyright are not obeyed ($r = .041$, $N = 300$, $P > .05$). Null Hypothesis is accepted.

Table10. *The Collective Contribution of Independent Variables (Awareness on Copyright, Students' Knowledge about Copyright) on Copyright Abuse*

R	R Square			Adjusted R Square	Std. Error of the Estimate
.804	.647			.641	1.1894
		A N O V A			
Model	Sum of Squares	DF	Mean Square	F	Sig.
Regression	4054.655	2	2027.327	52.993	.000
Residual	11362.262	297	38.257		
Total	15416.917	299			

Table 10 shows the joint contribution of the two independent variables to the prediction of the dependent variable, that is, copyright abuse was positively predicted by the independent variables. The table also shows a coefficient of multiple correlation (R = .513 and a multiple R^2 of .263. This means that 26.3% of the variance is accounted for by four predictor variables when taken together. The significance of the composite contribution was tested at $P < .05$. The table further displays the analysis of variance for the regression yielded an F-ratio of 52.993 (significant at 0.05 level). This implies that the joint contribution of the independent variables to the dependent variable was significant and that other variables not included in this model may have accounted for the remaining variance.

RQ 5: What is the relative effect of each of the independent variables (Awareness on Copyright, Students' Knowledge about Copyright) on Copyright Abuse?

Table 11. *Relative contribution of the independent variables (Awareness on Copyright, Students' Knowledge about Copyright) on Copyright Abuse*

Model	Unstandardized Coefficient		Stand. Coefficient	T	Sig.
	B	Std. Error	Beta Contribution		
(Constant)	2.974	3.350		.888	.375
Awareness on Copyright	.255	.077	.166	3.16	.001
Students Knowledge about Copyright	.448	.045	.497	9.946	.000

Table 11 reveals the relative contribution of the three independent variables to the dependent variable, expressed as beta weights, viz., Awareness on Copyright (β = .166, P <.05) and Students Knowledge about Copyright (β = .497, P<.05).The table above shows that the two independent variables are significant.

Summary of Findings

This study suggests that the respondents have fair knowledge of what constitutes copyright, but on a closer look, it appears that that the knowledge so claimed may not be correct in the real sense if it. For example, 80.7% of the respondents claimed they could photocopy a whole text book if need arises. Such claim conflicts materially with international best practices as to what is permitted to be reproduced under the copyright law.

Photocopy of materials and scanning of textbooks ranked highest amongst acts of infringements perpetrated by students. This is in tandem with Oyinloye's (2000) observation that photocopy accounts for the highest method of infringement of copyright amongst Nigerian students. A possible explanation for the high profile of photocopying activities amongst undergraduate students may be attributed to the heavy dependence on print resources in Nigeria. It would be observed that photocopying business is one of the booming businesses in tertiary institutions in Nigeria. This is partly due to the absolute freedom these business centres have in photocopying books and other intellectual materials to whatever volume required by their customers, not minding that such photocopy would undermine the profit accruable to the author of such intellectual work. The question begging for an answer is that if copyright infringement could be so allowed in an environment that should respect the intellectual proprietary rights of fellow academics across the globe, what then would happen outside school campus where there is no direct supervision on what is reproduced? Simply put, if gold could rust, what would happen to iron?

As regards the sources of undergraduates' information on copyright law, the activities of the Copyright Society of Nigeria (COSON) ranked highest. Equally, the efforts of the library and its staff have yielded positive result in imprinting the consciousness of the need to exercise caution when dealing with the intellectual works of others.

The respondents claim that their families and friends played a key role in copyright infringement of materials. This therefore underscores

the perceived effectiveness of having peer educators who would educate their peers and family members on the destructive tendencies that infringement on copyright could occasion on the knowledge economy is the same persists without being checked.

Poverty is still regarded as a root cause of infringement. This is in line with the view of Ogunrombi and Bello (as cited in Isiakpona, 2012) who had identified that only 5% of students could afford to buy book. This is further corroborated by 64.7% respondents who hold the view that the cost of purchase of books are outside the reach students. This condition may be exacerbated by the on-going economic recession that nation has been plunged into due to balance of payment disequilibrium due to the decreasing income from the sales of crude oil which the nation relied upon for the survival of her monolithic economy. However, these researchers are of the view that while poverty may be appealing to be cited as a justification for infringement, it would never be sufficient as the justification (either morally or legally) for reaping-off others of the fruits of their labour, since two wrongs would never make a right.

67.7% respondents see internet downloads as constituting a major source of infringement. This is indeed worrisome considering the fact that there is an increasing access and dependence on the internet for sales of copyrighted materials. 72% believed that personal computers are used to copy and re-write disc and other copyrighted information.

Meanwhile 76% attributed the rising incidence of copyright infringement by students to unethical collaboration with lecturers. With due respect, it beats one imagination that those expected to serve as models and beacons of hope through exemplary lifestyle are the ones collaborating with students to engage in the ignoble act copyright infringements.

Conclusion and Recommendations

This study reveals paradigm shift in copyright infringement from the traditional photocopy and unauthorized sales of copyrighted materials to high dependence on Information and Communication Technologies (ICT) in perpetrating infringements.

In light of findings above, it is recommended that:

1. The government of Nigeria invests more into education and provides subsidy to publishers and vendors of school related books and electronic resources so as to alleviate the plights of students whose purchasing powers have been grossly reduced due to the rising

inflation occasioned by technical recession the nation is currently faced with;
2. There should be efforts to protect the sanctity of the intellectual proprietary rights since the creative industry is a viable way out from the horrific economic experience the nation is currently through;
3. Copyright study be introduced to undergraduate students in Nigeria. This may be sandwiched into mandatory general courses taken by undergraduate students. It could be a taught alongside plagiarism or use of library;
4. The activities of COSON and other relevant stakeholders in the copyright sector should beam searchlight on unlawful and unethical practices on the internet, particularly with respect to access to protected files on the internet;
5. Institutions in Nigeria should have a widely publicized written policy as regards the extent of permissive reproduction within the premises of the University and efforts should be made to ensure that reprographic and reproduction centres in libraries and other designated points across Nigerian campuses adhere strictly to this policy;
6. Persons apprehended engaging in copyright abuse should be punished in line with the punishments stipulated for offenders. Such punishments should equally be publicized so as to serve as deterrence to others;
7. While continuous sensitization of the students is further encouraged, this should not be limited to students but also extended to their teachers and business owners who offer access to reproduce copyrighted materials. COSON could set up a task force made up of volunteers within the University to regularly monitor activities of business centres on campus in order to ensure that their activities remain within the confines of the law.

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Headings and their Three Levels

Flush Left, Uppercase and Lowercase Heading
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Tables

Table 1. *Student Mode of Study (n = 230)*

Mode	**Frequency**	**Percent**
On-campus	162	70.43
Off-campus	29	12.61
Both (mixed mode)	39	16.96

Note. Figures taken from 2015 calendar.

Figures

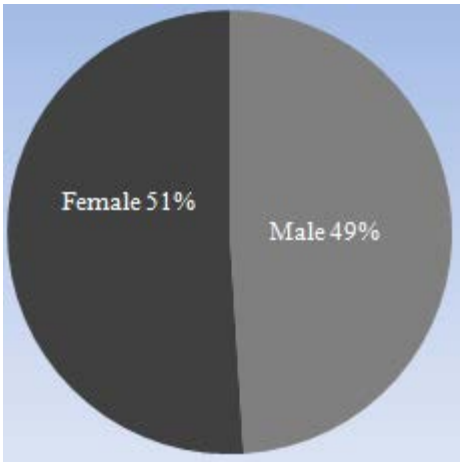

Figure 1. *Pie chart of population (n = 230)*

Title Page

TITLE OF PAPER

Author 1
Author 1 institutional affiliation
Author 1 email address

Subsequent authors
Subsequent authors' institutional affiliation(s)

Next to title page

Title of Paper

Abstract

Purpose –
Design/methodology/approach –
Findings –
Research limitations –
Practical implications –
Originality/value –
Paper type –

Keywords –

Body of Paper

IJoLIS Scope and Themes

- Academic writing and publishing in LIS
- Advances in library and information sciences
- Archives, records, and information management
- Augmented reality and libraries
- Big data and libraries
- Cataloguing and RDA
- Classification and subject headings
- Collection development and management
- Computer supported cooperative work
- Clouding and libraries
- Data curation and linked data
- Digital forensics
- Digital humanities
- Digital/virtual libraries
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- Foundations of library and information sciences
- ICTs and library and information sciences/services
- Information architecture
- Information behavior
- Information/knowledge economy/economics
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- Information literacy
- Information retrieval
- Information systems and services in multi-disciplines
- Information trust and privacy
- Informetrics and data analytics
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