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WEBOMETRIC ANALYSIS OF CENTRAL UNIVERSITIES IN NORTH EASTERN REGION, INDIA. A STUDY OF USING ALEXA INTERNET

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Abstract

Webometrics is concerned with measuring aspects of the web: web sites, web pages, parts of web pages, words in web pages, hyperlinks, web search engine results. Webometrics is huge and easily accessible source of information, there are limitless possibilities for measuring or counting on a huge scale of the number of web pages, the number of web sites, the number of blogs) or on a smaller scale. This study found the traffic rank in India, especially Central Universities of North East Region, the best-ranked Central University of North East Region are NEHU and TU with traffic ranks of 8484 and 8,511 respectively. Nagaland University has the highest number of average pages viewed by users per day (4.1), Sikkim University has highest (55.7%) upstream site of Google among other Central Universities of North East Region in India, 100% of sub domain at "manipuruniv.ac.in" for Manipur University website and "cau.ac.in" for Central Agricultural University. North Eastern Hill University (NEHU) and Sikkim University (SU) shows higher rate of bounce percentage (42.50) shows its weak performance.

Keywords: Webometrics, Central Universities, Links, Pages viewed, Bounce rate, Traffic Rank, Keyword search, Domain

Introduction

Webometrics was one of the methodologies developed during mid 1990s concerning the quantitative aspects of information and met with confusion about its scope and relation to the other emerging fields namely Netometrics, Webometry, Internetometrics, Cybermetrics and Webometrics among others. This was due to the fact that all these methods were developed drawing on ideas from bibliometrics. Björneborn and Ingwersen in redefined webometrics as a subfield of cybermetrics and sharing ideas with bibliometrics and scientometrics. Webometrics showed that the statistical analysis used in academic literature can also be applied to the study of link analysis in the World Wide Web and under controlled circumstances promising results can be obtained. This is also in compliance with that aimed to measure coverage bias in search engines in terms of building a sample of sites and examining the possible causes in the differences of results appearing in search engines, and converging to the conclusion that it is the visibility of a site that affects its coverage by search engines, the latter being measured by the number of links to it.

Webometrics is a new research field in Library and Information Science applying quantitative bibliometric methodology such as publication analysis, citation, cluster analysis to the 3Ds that is distributed, diverse and dynamical information space of the web, including web page content, links structures, search engine and user searching and browsing behavior. Webometrics is quantitative and quantitative study of web related phenomena, originated in the

realization that method originally designed for bibliometric analysis of scientific journal articles. The citation pattern could be applied to web with commercial search engines, providing the raw data. The purpose of Web evaluation determines the appropriate methods to be used. The best evaluation methods are user testing and expert evaluation, while automatic and Web analytics tools could provide a first insight into the status of the website. Similarly, if Web ranking and traffic statistics are of interest, then the scope of the evaluation is Web evaluation methods; thus the best way is to use a Web analytics tool such as Alexa. Alexa Internet is the most well-known tool for evaluating websites that offer a free- of- charge evaluation service few attributes.

One of the most instrumental ways for improving the Internet services is enabling qualitative and quantitative analysis of the web by means of webometrics. Webometrics accounts for link analysis, web citation analysis, evaluation of the search engines, and in general, descriptive study of the web. Webometrcis is defined as "the study of the quantitative aspects of the construction and use of information resources, structures and technologies on the web by applying bibliometric and infometrics approaches". In the era of information and communication technology, the online face of an organization can be easily taken as reflecting the quality of services delivery by the organization.

Alexa Internet Tool

Founded in 1996, Alexa is a California-based subsidiary company of Amazon.com (acquired by Amazon in 1999) that specializes in providing commercial web traffic data gathered via various toolbars and web browser extensions. Some of Alexa's most notable previous activities include providing a database that served as the basis for the creation of the Wayback Machine and the creation of various search facilities (now largely discontinued). However, the thing they're probably best known for being, of course, their 'Alexa Rank' – a metric that ranks websites in order of popularity or 'how [well] a website is doing' over the last 3 months.

Alexa provides rankings of sites based on visitor hits. Alexa's traffic estimates are based on a diverse sample of millions of worldwide internet users. Traffic data of Alexa are gathered from computers which the Alexa's toolbar is installed on them. Alexa provides two traffic rankings. The first rank is site's rank according to visitors of the country, and the other is global rank which is site's rank according to visitors around the world. Alexa tracks over 30 million websites. Sorting is based on the 3 month Alexa traffic rank.

A Brief Note about Central University in India

A Central University in India is under the Department of Higher Education in the Ministry of Human Resource Development (MHRD) and it is recognized by the University Grants Commission (UGC) with the regulations made in the regard under the UGC Act, 1956. The Central Government provides grants to UGC and establishes Central Universities/Institutions of National Importance in the country. In India; there are 49 Central Universities out of which 10 Central Universities come under the different states of North Eastern region. Officially North East Region, NER is the easternmost region of India representing both a geographic and political administrative division of the Country. It comprises eight states – Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura.

List of Central Universities in North Eastern Region

S.N	Central University Name	Place / State	URL
1	Rajiv Gandhi University (RGU)	Doimukh/Arunachal Pradesh	https://www.rgu.ac.in/
2	Assam University (AU)	Silchar/ Assam	http://www.aus.ac.in/
3	Central Agricultural University (CAU)	Imphal / Manipur	https://www.cau.ac.in/
4	Manipur University (MU)	Imphal /Manipur	http://www.manipuruniv.ac.in/
5	North Eastern Hill University (NEHU)	Shillong/ Meghalaya.	http://www.manipuruniv.ac.in/
6	Mizoram University (MU)	Aizal/Mizoram	https://www.mzu.edu.in/
7	Nagaland University (NU)	Lumami /Nagaland	http://nagalanduniversity.ac.in/English/
8	Sikkim University (SU)	Gangtok, / Sikkim.	https://cus.ac.in/index.php/en/
9	Tripura University (TU)	Agartala/ Tripura.	http://www.tripurauniv.in/
10	Tezpur University (TEZU)	Tezpur/ Assam	http://www.tezu.ernet.in/ http://www.tezu.ac.in/

<div align="center">Table 1. List of Universities and its URL in NER, India</div>

Literature review

Muthuraja and Veerabasavaiah (2018) evaluated Kannada News Paper Websites Using Alexa Internet Tool. The 10 leading Kannada language newspaper websites from the state of Karnataka were taken for evaluation. Each newspaper web site was searched in Alexa databank and relevant data, including traffic rank, pages viewed, speed, links, and bounce percentage, time on site, search percentage, and percentage of Indian/foreign users were collected and these data were tabulated and analyzed. The result of this study shows that Vijayakarnataka has 2,255 the highest traffic rank in India Udayavani has 27,903 the highest traffic rank in global. Vijayakarnataka has 7.32 having the highest number of average pages viewed per day and 12:40 estimated daily time spent on site by the visitors.

Kokila Harshan Ramanayaka et.al (2018) conducted a study entitled Application of Webometrics Techniques for Measuring and Evaluating Visibility of University Library Websites in Sri Lanka findings of the study will guide to the librarians to evaluate the strengths and weaknesses accordingly with the performance of their library websites. In general, the effective presence of these library websites on the internet can be passed on as the top by having the proper number of site pages in the website that impact their deceivability through web search tools and accordingly the quantity of receiving external links. Meanwhile, libraries having low, rich files can publish more rich files on the web to improve their overall rank.

Stephen (2017) in his study evaluates the websites of Ministry of Electronics and Information Technology (Meity) Organizations in India using the Alexa Internet. The 16 Meity Organizations in India, which have the web presence, are included in the study. The results of the analysis give interesting insights about the organization's websites. Unique Identification Development Authority of India (UIDAI) is the most popular website and in the first position among the entire organization's website. It holds global rank 572, 29th rank in India. National Informatics Centre (NIC) and Education Research Network (ERNET) websites holds the highest

bounce rate of 64.5. UIDAI website holds the highest links of 1154.Among the Meity autonomous bodies National Institute of Electronics and Information Technology (NIELIT) websites holds first rank and overall NIELIT websites holds second rank.

Buhl et al (2016) in an article by the title of " Observing the Dynamics of the Online News Ecosystem: News diffusion processes among German news websites" acknowledge that online news product is determined from report's velocity and changes like contrast of news stream in online news ecosystem. However, these two content are opposite for report, there are few researches about dynamic of news streams in ecosystem level. Considering applied techniques for automatic analysis of content and large data of online news content, an approach is suggested for performance and dynamic of news diffusion process among online news websites. A few reasoning methods are reviewed for velocity of online news product based on cover of urgent news with high urgency and with imitation from online news presenters.

Naheem and Rao (2016) in their study the 8 leading Telugu newspaper websites from the state of Andhra Pradesh were analyzed using well known tool called "Alexa Internet". Each one of the newspaper websites was searched in Alexa databank and relevant data were collected. Further, these data were tabulated and analyzed. The results of this study show that, the websites of the newspaper „Eenadu" did remarkable performances in most of the attributes like highest traffic rank in both local & global , daily time spent on site by the visitors , the number of links and the highest number of foreign users. „Sakshi" has the highest number of average pages viewed per day and lowest bounce percentage. The fastest downloading speed is for Andhra Prabha. The highest percentage of visits that came from search engines is for Visalaandhra.

Objectives of the study

The objective of this study is the evaluation of Central University websites in North East Region (NER), India based on seven, Alexa indexes including: traffic rank, pages viewed, links, bounce percentage, time on site, search percentage, Indian and foreign users. And also to identify the highest percentage of Keyword search, upstream sites and sub domain percentage of visitors. Top three similar sites by audience overlap to be analyzed.

Methodology

The present study has been done by using webometric methods with the help of Alxa databank, which is known as the most famous tool for evaluating websites. In this research, researcher selected seven indexes – i.e. traffic rank, pages viewed, links, bounce percentage, time on site, search percentage, Indian and foreign users. – in order to analyze Central Universities of North East Region (India) websites. The 9 (10 – Remaining one) leading Central Universities listed on the website of the MHRD (https://mhrd.gov.in/central-universities) as taken as a sample for evaluation in the present study. The internet addresses (URLs) of these Central University of North Eastern Region, India were collected from the internet. Using these URLs, each Central University web site was searched on 30th April, 2019 at Alexa website (www.alexa.com) and all the data were obtained by real-time examinees according to prearranged evaluation indexes. The data collection process was completed on the same day to decrease possible errors associated with frequent website updates. The downloaded data were further entered into the specially designed Microsoft Excel worksheet. Then data were then analyzed and tabulated to relevant findings in accordance with the desired objectives. The list of the Central University of North

Eastern Region, India with their URLs, which are coming under the purview of this study, is provided in Table 1.
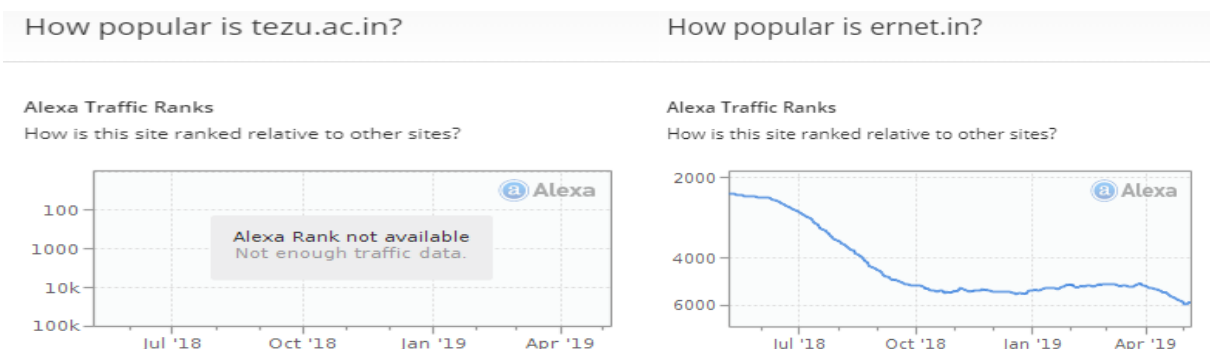
The reason Tezpur University is not include in the study

Tezpur University is not included in this study even that university has two URL, because of not enough traffic data in the URL of http://www.tezu.ac.in/ and another URL data result directed to original and official site of ERNET http://www.tezu.ernet.in/.

Data analysis and Interpretation

S. No	Name of University	Traffic Rank		Pages viewed	Links	Bounce rate	Time on site	Search visit	User percentage	
		India	Global						India	Foreign
1	RGU	29,359	359,490	3.50	287	34.40	2:54	46.30	97.6	2.3
2	AU	14,797	207,679	2.90	426	40.70	3:25	39.50	94.8	1.7
3	CAU	51,567	721,039	2.40	94	25.60	1:48	46.30	99.6	0.4
4	MU	30,632	445,845	3.60	270	30.80	3:26	53.40	100	-
5	NEHU	8484	112,062	3.30	502	42.50	3:30	37.50	94.9	5.1
6	MzU	8567	156,895	3.40	337	37.90	3:58	36.70	96.9	3.1
7	NU	48,462	615,187	4.10	177	29.40	4:16	55.90	97.3	2.7
8	SU	18,182	263,693	2.90	177	42.50	3:17	40.60	96.3	3.7
9	TU	8511	134,961	3.90	342	36.80	4:47	42.50	95.8	4.2

**Table 2. Cumulative data obtained from Alexa Internet on 30/04/2019**

Traffic Rank

The algorithm according to which Alexa traffic ranking is calculated, is simple. It is based on the amount of traffic recorded from users that have the Alexa toolbar installed over a period of three months. This traffic is based on such parameters as reach and page views. The reach refers to the number of Alexa users who visit a particular site in one day. Page view, as its

name shows, is the number of times a particular page (URL) is viewed by Alexa users. Alexa.com makes it clear though that, if a particular user visits the same URL multiple times on the same day, all those visits will be counted as one. The first step of the ranking process is calculating the reach and number of page views for all the sites on the Web on a daily basis. The Alexa ranking is obtained by performing the geometric mean of reach and page views, averaged over a predefined period of time (three months).
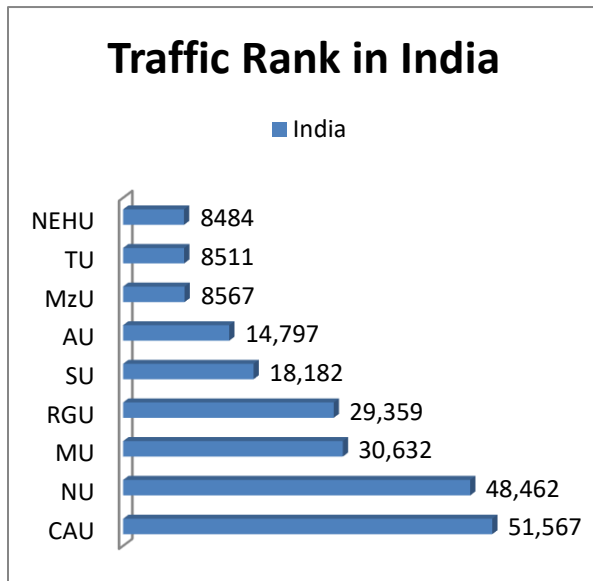

Figure 1 Traffic Rank in India
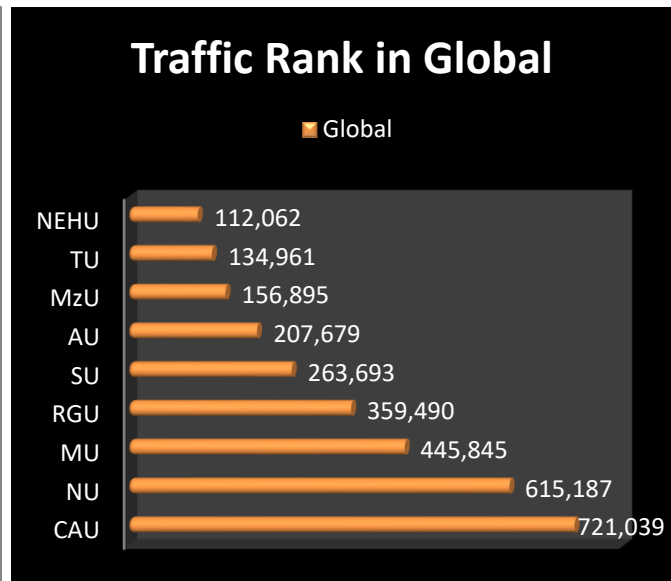
Figure 2. Traffic Rank in Global

The Alexa ranking is obtained by performing the geometric mean of reach and page views, averaged over a predefined period of time (three months). With regard to the attribute traffic rank in India, the best-ranked Central University of North East Region are NEHU and TU with traffic ranks of 8484 and 8,511 respectively. The Central University of NER like, CAU, NU, MU shows high traffic ranks, which reflects their weak performance on this account. Out of the nine Central Universities of NER, only three have a traffic rank of less than 10,000, which projects their good performance in this attribute while compared to others. In the case of Global traffic rank, NEHU with traffic rank with 112,062. No one Central university of NER has traffic rank less than 10000 from that all are shown very weak performance in this attribute. After NEHU, TU Traffic rank globally with 134,961.

Pages View

It is an estimated percentage of global page views. Page views measure the number of pages viewed by site visitors. Multiple page views of the same page made by the same user on the same day are counted only once. The page views per user numbers are the average numbers of unique pages viewed per user per day by the visitors to the site. The three-month change is determined by comparing a site's current page view numbers with those from pages viewed three months ago, which reflects the average number of pages viewed by users in a certain web site. Page views/user is the estimate of daily unique page views per user (Alexa Internet, 2016).
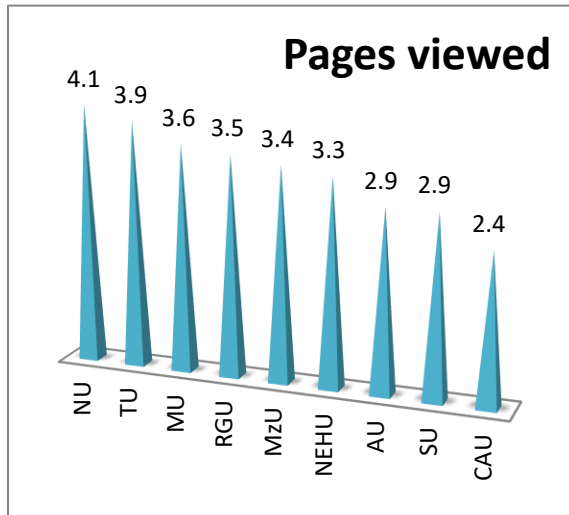
Figure 3. Pages Viewed per day
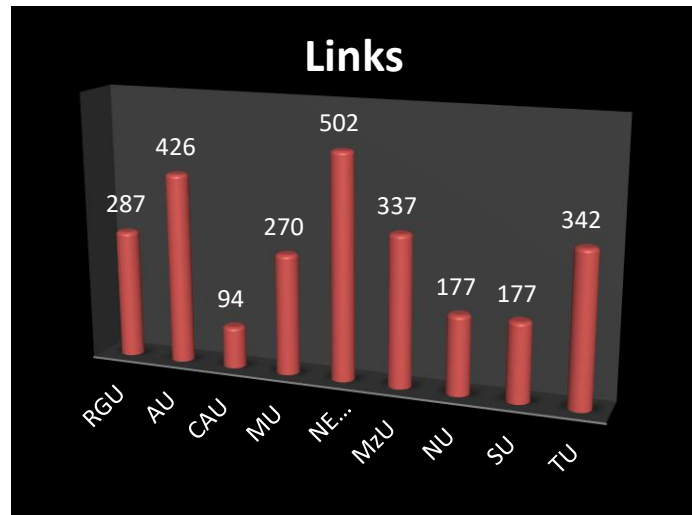
Figure 3. No. Links in the Website

Concerning to this attribute, Nagaland University (NU) has the highest number of average pages viewed by users per day (4.1), followed by Tripura University (3.9) and MU (3.6). The lowest number of average pages viewed is 2.4% for CAU (Table 2). Except the first three Central Universities in North Eastern Region (NU, TU& MU) all others have shown bad function in this attribute. NEHU got sixth position in this attitude with 3.3%.

Links

A measure of reputation, which includes a number of websites connected to a certain website which shows its popularity. Regarding the number of links that each Central Universities of North Eastern Region websites have received, North Eastern Hill University (NEHU) has received the highest number of links (502), which is considerably different from other Central Universities of North East Region. This university has covered a various range of web links like admission, result, library, recruitment, Tender, Campus, academics, research, Mail, library, Repository links which has probably made it much more popular than others. AU with 426 links occupied second place, followed by TU 342 links. CAU has only 94 links is the last in the queue. Majority of the Central Universities of North East Region websites has less than three hundred links shows their poor performance in this attribute.

Bounce percentage

The estimated percentage of visits that consist of a single page view called bounce rate. Central Agricultural University (CAU) has the lowest bounce percentage (25.60) followed by NU with (29.40) and MU (30.80). North Eastern Hill University (NEHU) and Sikkim University (SU) shows the higher rate of bounce percentage (42.50) shows its weak performance. The high bounce rate in most of the Central Universities of North Eastern Region websites indicates their weak performance in this attribute.
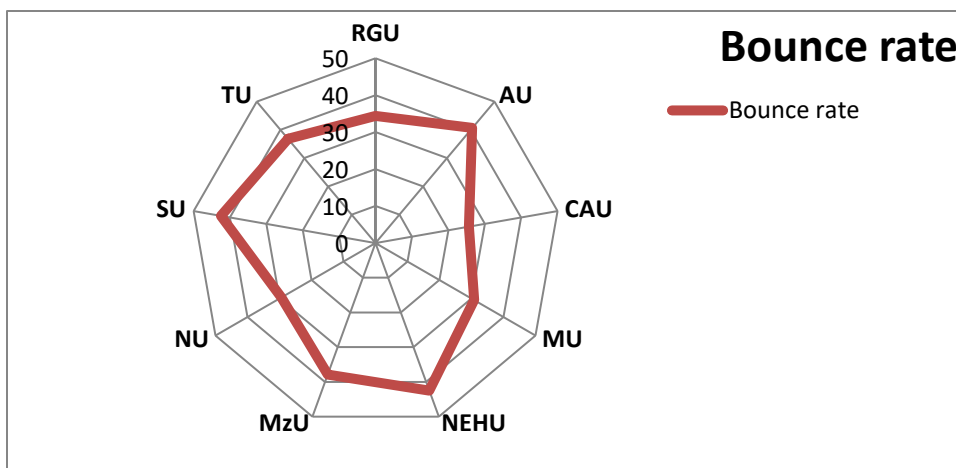
Figure 5. Bounce Rate of NER, India Central University Websites

Time on site

According to Alexa internet Estimated daily time on site (mm:ss) method. The estimated daily time spent on site by the visitors is highest for Tripura University (4:47), Nagaland University occupies second place with (4:16) followed by Mizoram University (3:58) and the lowest in this category is for Central Agricultural University (1:48). The time spent on the rest of the site is in the range of 1:48- 4:47.
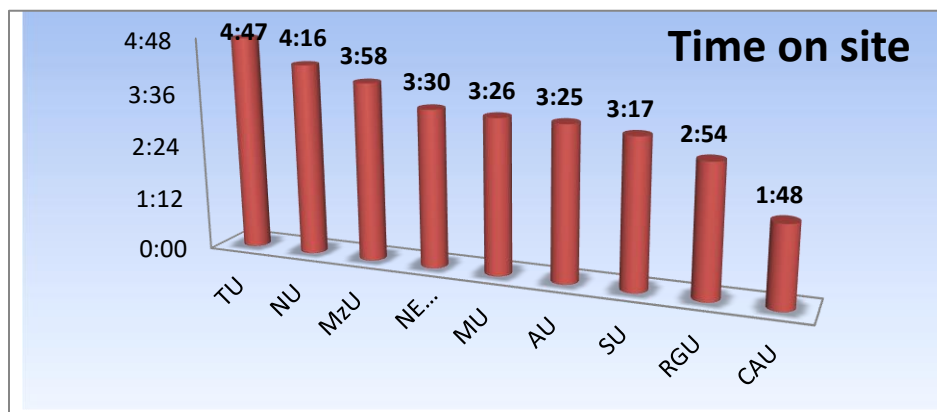
Figure 6 - Time on Site

Search Percentage

The percentage of traffic, both free and paid, that come to Alexa Internet from a search engine over the past 3 months, updated daily. The change number shows the difference versus the previous 3 month period. The estimated percentage of visits that came from a search engine. The highest percentage of visits that came from search engines is for Nagaland University (NU) with (55.90) and the lowest is (36.70) for Mizoram University (MzU) in Central University of North Eastern Region in India.
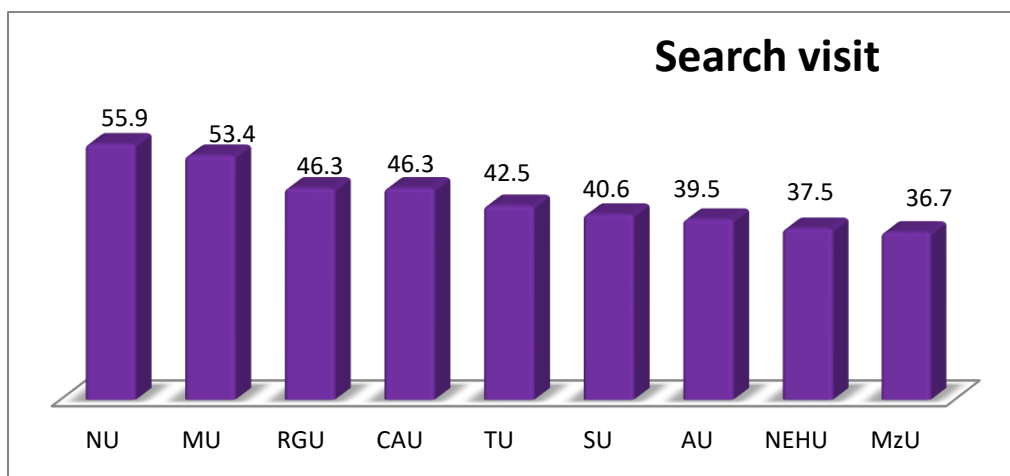
Figure 7- Revealed Search visit

Top Keywords from Search Engines

The table 3 shows the top keywords that sent traffic to this site from major search engines over the past 6 months. The list is updated monthly. Highest Number of audience (65.50%) searched using the keyword "central agricultural university" to view the CAU website, followed by 59.08 percentage visitors are searched in the search engine as "sikkim university" to view that Sikkim University website, 58.53% of audience searched to view the Nagaland University website as "nagaland university". Only 19.49 percentage of NEHU audience used as "nehu". Researcher clearly noted 100% of audience who are searching the central university of North East Region those all are using small alphabet while entered keyword to search.
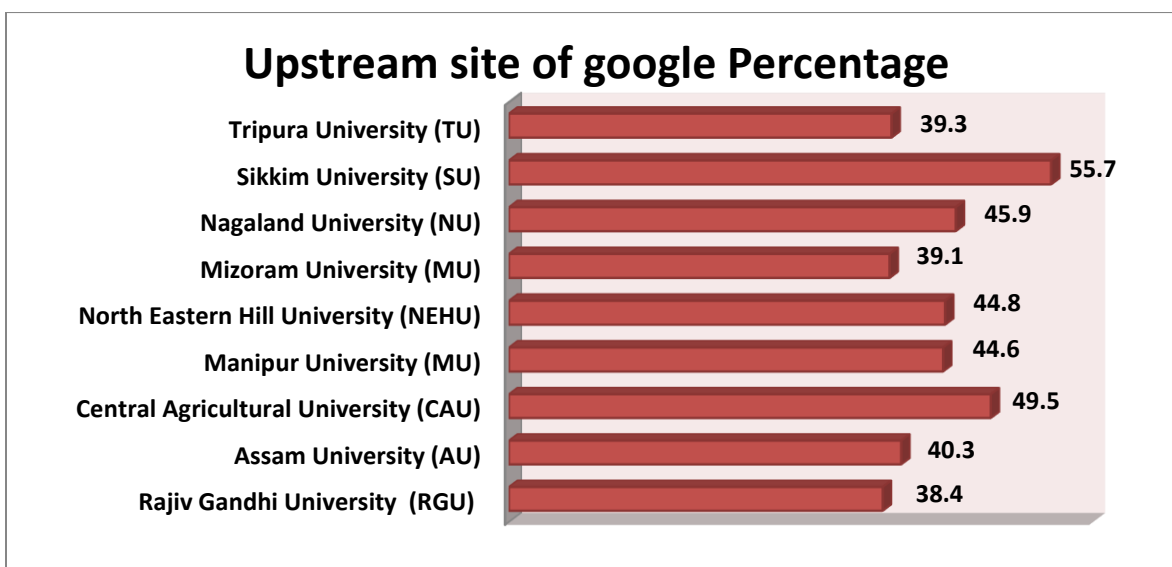
S.No	Name of Central University	Keyword	Percentage
1	Rajiv Gandhi University (RGU)	rajiv gandhi university	25.42
2	Assam University (AU)	assam university	36.88
3	Central Agricultural University (CAU)	central agricultural university	65.50
4	Manipur University (MU)	manipur university	48.32
5	North Eastern Hill University (NEHU)	nehu	19.49
6	Mizoram University (MzU)	mizoram university	43.99
7	Nagaland University (NU)	nagaland university	58.53
8	Sikkim University (SU)	sikkim university	59.08
9	Tripura University (TU)	tripura university	25.88

Table 3. Keyword search in the Search Engine (Highest Percentage for Each Site)

Upstream site about Google Percentage

Upstream sites are sites that people visited just before they visited the university site. This list is not the same as referrals from upstream sites. There is not necessarily a link between the upstream site and this site. Sikkim University has the highest (55.7%) upstream site about Google among other Central Universities of North East Region in India. Followed by Central

Agricultural University (49.5%), North Eastern Hill University (44.8%), and Manipur University (44.6%). Mizoram University (39.1) and Tripura University (39.3) are least percentage an upstream site about Google percentage.

Upstream site of google Percentage

University	Percentage
Tripura University (TU)	39.3
Sikkim University (SU)	55.7
Nagaland University (NU)	45.9
Mizoram University (MU)	39.1
North Eastern Hill University (NEHU)	44.8
Manipur University (MU)	44.6
Central Agricultural University (CAU)	49.5
Assam University (AU)	40.3
Rajiv Gandhi University (RGU)	38.4

Figure 8- **Upstream site about Google Percentage**

Sub domain percentage of visitors

The table shows the top sub domains for the websites of Central University of NER by the highest percentage of visitors that visited the sub domain over a month. Sometime the percentages can add up to more than 100% because a visitor can visit multiple sub domains during the month. Visitors used 100% of sub domain at "manipuruniv.ac.in" for Manipur University website and "cau.ac.in" for Central Agricultural University. Followed by 99.71% percentage of visitors used mzu.edu.in for Mizoram University, 99.30% audience used cus.ac.in for the Sikkim University, 99.07% visitors used the sub domain "aus.ac.in" for the Assam University. Only 75.52 percentage of the audience used "nehu.ac.in" for North Eastern Hill University (NEHU).

S.No	Name of Central University	Sub domain	Percentage
1	Rajiv Gandhi University (RGU)	rgu.ac.in	98.98
2	Assam University (AU)	aus.ac.in	99.07
3	Central Agricultural University (CAU)	cau.ac.in	100
4	Manipur University (MU)	manipuruniv.ac.in	100
5	North Eastern Hill University (NEHU)	nehu.ac.in	75.52
6	Mizoram University (MU)	mzu.edu.in	99.71
7	Nagaland University (NU)	nagalanduniversity.ac.in	81.86
8	Sikkim University (SU)	cus.ac.in	99.30
9	Tripura University (TU)	tripurauniv.in	94.15

Table 5. Highest Sub domain percentage by the visitors

Top three similar website by audience overlap (Link)

S.No	Name of Central University	No.1 Similar site	No.2 Similar site	No.3 Similar site
1	RGU	nagalanduniversity.ac.in	manipuruniv.ac.in	cus.ac.in
2	AU	ausadmission.in	ausexamination.ac.in	ausexamresults.in
3	CAU	chfcau.org.in	rlbcau.ac.in	cvsccauaizawl.edu.in
4	MU	rgu.ac.in	nagalanduniversity.ac.in	manipur.gov.in
5	NEHU	mzu.edu.in	rgu.ac.in	dibru.ac.in
6	MzU	nehu.ac.in	mizoram.gov.in	rgu.ac.in
7	NU	rgu.ac.in	manipuruniv.ac.in	aus.ac.in
8	SU	rgu.ac.in	spscskm.gov.in	nagalanduniversity.ac.in
9	TU	tripurauniv.ac.in	tpsc.gov.in	tpsconline.in

Table 6. Top three similar sites of NER Central Universities

The Table 6 is witnessed for top three similar sites of Central Universities of North East Region in India. For Rajiv Gandhi University, nagalanduniversity.ac.in is the no1 similar site, manipuruniv.ac.in is the second similar link and cus.ac.in is the third related similar site. Among nine central universities rgu.ac.in is the similar No.1 similar site for three universities (Manipur University, Nagaland University and Sikkim University. Manipuruniv.ac.in is the No 2 similar sites for two universities Rajiv Gandhi University and Nagaland University.

Audience geography percentage outside of India

SN	Name of Central University	Foreign Audience	Specific Country	Percentage	Traffic Rank
1	AU	1.7 %	Egipt	1.7 %	68,866
2	NEHU	5.1 %	UK	3.4 %	70,602

Table 7. Audience geography percentage outside of India

Above the table expressed the audience geography for two universities which have specific rank especially in foreign countries. Only Two Central University of North East Region websites is used by majority foreign users. Assam University has the rank in Egypt 68,866 the position and North Eastern Hill University have the specific rank in UK 70,362. Out of nine universities these two universities have wide audience Egypt and UK respectively. The table 1 shows the data on Indian and foreign users. It is inferred from these results that migrated Indians, Alumni of those universities, foreign scientists and academicians who are especially involving the academic activity news through the websites of these Two Universities.

Findings and Suggestions

Traffic rank in India, the best-ranked Central University of North East Region is North Eastern Hill University and Tripura University with traffic ranks of 8484 and 8,511 respectively.

The Central University of NER like, CAU, NU, MU shows high traffic ranks, which reflects their weak performance on this account. Nagaland University has the highest number of average pages viewed by users per day (4.1), followed by Tripura University (3.9) and Manipur University (3.6). The lowest number of average pages viewed is 2.4% of Central Agricultural University. Central Agricultural University has the lowest bounce percentage (25.60) followed by Nagaland University with (29.40) and Manipur University (30.80).

North Eastern Hill University (NEHU) and Sikkim University (SU) shows higher rate of bounce percentage (42.50) shows its weak performance. The estimated daily time spent on site by the visitors is highest for Tripura University (4:47), Nagaland University occupies second place with (4:16). Highest Number of audience (65.50%) searched using the keyword "central agricultural university" to view the CAU website, followed by 59.08 percentage visitors are searched in the search engine as "sikkim university" to view that Sikkim University website, 58.53% of audience searched to view the Nagaland University website as "nagaland university".

Sikkim University has the highest (55.7%) upstream site of Google among other Central Universities of North East Region in India. rgu.ac.in is the similar No.1 similar site for three universities (Manipur University, Nagaland University and Sikkim University. Manipuruniv.ac.in is the No 2 similar sites for two universities Rajiv Gandhi University and Nagaland University.

The outcomes of this study would contribute significantly to the benefit of the technological society in the area of web design and its performance evaluation. In addition, it would also contribute towards indicating the extent to which each Central University of North Eastern States has successfully represented itself on the internet and provides the basis for future research in web evaluation, usability and other related areas.

Conclusion

Search facilities of commercial search engines are constantly changing, being a main obstacle for Webometrics studies. The webometrics is useful for scientists to measure aspects of the web and explains how this can be achieved on both a small and large scale. The webometrics are intended for scientists with research topics that are wholly or partly online (e.g., social networks, news, political communication) and social scientists with offline research topics with an online reflection, even if this is not a core component (e.g., diaspora communities, consumer culture, linguistic change). The purpose of this website evaluation using Alexa Internet tool helps the webmaster and the respective Central Universities of North Eastern Region websites to improvise the usability of websites. The present study has been explored and there is possibility to future research in this area. The result of this study gives an overall preview of the Central University in North Eastern Region, India (NER) websites traffic and page ranks of local and foreign.

Reference.

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