WEBSITES OF SAINIK SCHOOLS IN INDIA: A WEBOMETRIC ANALYSIS

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Abstract: The paper throws light on web presence of websites of Sainik Schools in India by webometric analysis. Link analysis of websites was used to determine the no of web pages, in link pages and self link pages thereby ranking the websites based on Web Impact Factor (WIF) and Revised Web Impact Factor (R-WIF). Spearman's Rank Correlational coefficient was also used to determine the closeness or association of both type of rankings. It is clear from the analyses that the rankings based on WIF and R-WIF have much closeness or association with each other.

Keywords: Webometrics, Sainik Schools, Link Analysis, Spearman's Rank Correlation Coefficient

1.0 Introduction

In the changing world, 'world wide web' or simply 'web' is a commonly used term. Web is a hypermedia system that allows users to view and retrieve information from documents containing links. Webometrics is a study that involves measurements of various aspects of information contained in the World Wide Web. Bjoneborn and Ingverson[1] defined webometrics as "the study of the quantitative aspects of the construction and use of information resources, structures, and technologies on the web, drawing on bibliometric and informetric approaches."

There are different areas in webometrics such as link analysis, content analysis, usage analysis, error analysis etc. The present study involves link analysis to find out Web Impact Factor (WIF) and Revised Web Impact Factor (R-WIF) of websites of Sainik Schools in India, thereby ranking the websites and establishing the relationship between WIF and R-WIF using Spearman's Rank correlation co-efficient.

2.0 Sainik Schools in India

The concept of the Sainik Schools originated in 1961, in the visionary mind of late V.K. Krishna Menon, who was the then Defence Minister of India. The main objective of establishing Sainik schools is to rectify the regional and class imbalance amongst the officer cadre of the Indian Military, and to prepare students for entry into the National Defence Academy (NDA), Khadakwasla, Pune, India Naval Academy (INA), Ezhimala and Air Force Academy, Dundigul. From the first Sainik school, formed in 1961, now there are 26 Sainik schools in India. Out of 26 Sainik schools, 17 were formed within 10 years of first inception (Table 1). The last formed, Sainik School Chhingchip in Mizoram, is not having a website. So the study is confined only to the websites of 25 Sainik Schools.

Table 1: Year of Establishment of Sainik Schools in India

Year of Establishment	No of Sainik Schools	Percentage
Before 1960	0	0
Between 1961 and 1970	16	61.54
Between 1971 and 1980	2	7.7
Between 1981 and 1990	0	0
Between 1991 and 2000	0	0
Between 2001 and 2010	7	26.92
After 2010	1	3.85
Total	**26**	**100**

Sainik schools spread all over India in almost all the states. Certain states are having more than one Sainik school. Table 2 shows state wise distribution of Sainik schools in India.

Table 2: State Wise Distribution of Sainik Schools in India

State	No of Sainik Schools	Percentage
Andhra Pradesh	2	7.69

Assam	1	3.85
Bihar	2	7.69
Chhatishgarh	1	3.85
Gujarat	1	3.85
Haryana	2	7.69
Jammu & Kashmir	1	3.85
Himachal Pradesh	1	3.85
Jharkhand	1	3.85
Karnataka	2	7.69
Kerala	1	3.85
Madhya Pradesh	1	3.85
Maharashtra	1	3.85
Manipur	1	3.85
Mizoram	1	3.85
Nagaland	1	3.85
Orissa	1	3.85
Punjab	1	3.85
Rajasthan	1	3.85
Tamil Nadu	1	3.85
Uttarakhand	1	3.85
West Bengal	1	3.85
Total	**26**	**100**

Coming to the domain extension, most of the websites (10 nos.) are having domain extension .org. Domain extensions such as .com and .nic.in are being used by 5 and 4 websites respectively. Rest of the schools are using other extension such as .in, .org.in, .edu.in, .ac.in

Table 3: Domain-Wise Categorisation of Websites

Sl. No.	Domain	Number of websites	Percentage
1	.org	10	40.00
2	.com	5	20.00
3	.in	2	8.00
4	.org.in	1	4.00
5	.nic.in	4	16.00
6	.edu.in	3	8.00
7	.ac.in	1	4.00
Total		**25**	**100**

3.0 Review of Related Literature

R. Chakrawarthy and S. Wasan[2] studied library websites of Higher Education institutions of India using Google search engine. In the study, they used Spearman's co-efficient to establish the relationship between WIF and R-WIF. Ranking of websites of Central Universities in India was done by R. Babu, R. Jeyshankar and P. N. Rao[3] as part of their study involving link analysis of these websites where as S. K. Jalal, S. C. Biswas and P. Mukhopadhyay[4] compared the results of link analysis of Central University websites using various search engines.

R.K. Maharana, K.C. Panda and J. Sahoo[5] studied the websites of Indian Institutes of Technology and analyse different kinds of web impact factors using Alta Vista Search Engine. B. Ratha, L. Joshi and G.H.S Naidu[6] conducted a detailed study on websites of IITs by practically analysing each websites without using any search engine commands. Traffic and page ranks of Research Councils of India websites had been enumerated by Krishna Kumar and Nirmala[7] using Alexa Traffic Rank and the Global Rank where as links between African and World Universities had been studied and stated in his book by Janet Adekannbi.[8]

Link analysis of University websites in Sri Lanka were done by M. Vijayakumar[9] and ranked the websites based on WIF and concluded that website of University of Colombo comes first in ranking.
S. Thanuskodi and S Naseehath[10] conducted webometric analysis of medical tourism websites in Kerala and investigated the retrieval efficiency of different search engine on these websites.

4.0 Objectives of the study

The main objectives of the present study are:

   i)   To analyse the presence of Sainik Schools in World Wide Web.
   ii)   To find the number of web pages, in link pages and self link pages of websites of Sainik Schools in India.
   iii)   To rank the websites based on WIF and R-WIF.
   iv)   To establish the correlation between WIF and R-WIF of websites of Sainik Schools in India using Spearman's Rank Correlation.

5.0 Methodology

The main aim of the study is to find out the number of web pages, in link pages and self link pages. For that, Google search engine was selected to retrieve necessary results. Certain commands using Boolean operators were used to collect information. For examples:

- 'Site : www.sainikschooltvm.nic.in' was used to retrieve total number of web pages.
- 'Site : www.sainikschooltvm.nic.in NOT
- link domain : www.sainikschooltvm.nic.in' was used to retrieve total number of in link pages.
- 'Site : www.sainikschooltvm.nic. in AND link domain : www.sainikschooltvm.nic.in' was used to retrieve total number of self-link pages.

After extracting these results, WIF and R-WIF can be calculated using these formulae:

$$WIF = (IL + SL)/WP$$
$$R\text{-}WIF = IL/WP$$

Spearman's Rank correlation can be calculated using the following equation:

$$\text{Rank Correlation coefficient } (r) = \frac{N\sum XY - (\sum X) + (\sum Y)}{\text{Sqrt }([N\sum X^2 - (\sum X)^2][N\sum Y^2 - (\sum Y)^2])}$$

Where; X = R-WIF and Y = WIF

6.0 Analysis

The results were extracted on 24th August 2017. From the analysis of results, it is clear that rankings based on Web Impact Factor (WIF) (Table 4) and Revised Web Impact Factor (R-WIF) (table 5) are almost similar. Websites which come in first seven ranks are same and also 11 out of 25 websites are having same rank. Website of Sainik School Korukonda comes first in both the rankings. Websites of Sainik School Kapurthala and Sainik School Kalikiri come respectively in second and third position. The websites of Sainik School Satara, Sainik School Imphal, Sainik School Rewa and Sainik School Bhubaneswar comes in 4th, 5th, 6th and 7th positions respectively. Website of Sainik School Purulia , which comes in 8th position based on WIF Ranking, interchanged its position with the website of Sainik School Kunjupura in R-WIF based Ranking and comes down in 9th position, where as the website of Sainik School Tilaiya which is in rank 13 based on WIF ranking moves up to 12th Rank in R-WIF based ranking.

The website of Sainik School Nagrota comes in rank 11 based of WIF ranking but moves down to 14th in R-WIF based ranking. A major difference in Rank is shown only by the website of Sainik School Bijapur. In WIF based ranking, the position of website of SS Bijapur is 17 while in the case of R-WIF based ranking the position of SS Bijapur comes down to 22. Webiste of Sainik School Rewari comes in 24th rank in WIF based rank and becomes last in the ranking based on R-WIF. Website of Sainik School Ambikapur which comes last in WIF based ranking moves up to 24th rank in R-WIF based ranking.

Table 4: Ranking of Sainik Schools Websites Based on WIF

Name of Sainik School	URLs	WP	IL	SL	WIF	Rank
SS, Korukonda	www.sainikschoolkorukonda.org	6640	6970	7610	2.1958	1
SS, Kapurthala	www.sskapurthala.com	495	286	501	1.5899	2
SS, Kalikiri	www.kalikirisainikschool.com	1190	605	965	1.3193	3
SS, Satara	www.sainiksatara.org	602	292	411	1.1678	4

SS, Imphal	www.ssimphal.nic.in	325	138	69	0.6369	5
SS, Rewa	www.sainikschoolrewa.ac.in	6390	2710	1230	0.61666	6
SS, Bhubaneswar	www.sainikschoolbhubaneswar.org	9760	2650	2830	0.5615	7
SS, Purulia	www.sainikschoolpurulia.com	3720	758	1140	0.5102	8
SS, Kunjpura	www.sskunjpura.org	6830	1560	1820	0.4949	9
SS,Gopal Ganj	www.ssgopalganj.in	2070	410	527	0.4527	10
SS, Nagrota	www.sainikschoolnagrota.com	18600	2330	4290	0.3559	11
SS, Amaravathi Nagar	www.sainikschoolamaravathinagar.edu.in	20300	3210	3620	0.3365	12
SS, Tilaiya	www.sainikschooltilaiya.org	7370	961	1200	0.2932	13
SS, Ghorakal	www.ssghorakhal.org	3540	401	564	0.2726	14
SS, Goalpara	www.sainikschoolgoalpara.org	3050	390	438	0.2715	15
SS, Kazhakootam	www.sainikschooltvm.nic.in	11500	1050	1820	0.2496	16
SS, Bijapur	www.ssbj.in	157000	2060	27200	0.1864	17
SS, Balachadi	www.ssbalachadi.org	6120	708	271	0.16	18
SS, Kodagu	www.sainikschoolkodagu.edu.in	5760	319	479	0.1385	19
SS, Sujanpur Tira	www.sainikschoolsujanpurtira.org	3080	192	232	0.1377	20
SS, Punglwa	www.sainikschoolpunglwa.nic.in	1230	38	91	0.1049	21
SS, Chittorgarh	www.sschittorgarh.com	4800	259	150	0.0852	22
SS, Nalanda	www.sainikschoolnalanda.bih.nic.in	10500	110	765	0.0833	23
SS, Rewari	www.ssrw.org	157000	170	7360	0.048	24
SS, Ambikapur	www.sainikschoolambikapur.org.in	13400	65	113	0.0133	25

Table 5: Ranking of Sainik Schools Websites Based on R-WIF

Name of Sainik School	URLs	WP	IL	SL	R-WIF(X)	Rank
SS, Korukonda	www.sainikschoolkorukonda.org	6640	6970	7610	1.0497	1
SS, Kapurthal	www.sskapurthala.com	495	286	501	0.5778	2
SS, Kalikiri	www.kalikirisainikschool.com	1190	605	965	0.5084	3
SS, Satara	www.sainiksatara.org	602	292	411	0.485	4
SS, Imphal	www.ssimphal.nic.in	325	138	69	0.4246	5

SS, Rewa	www.sainikschoolrewa.ac.in	6390	2710	1230	0.4241	6
SS, Bhubaneswar	www.sainikschoolbhubaneswar.org	9760	2650	2830	0.2715	7
SS, Kunjpura	www.sskunjpura.org	6830	1560	1820	0.2284	8
SS, Purulia	www.sainikschoolpurulia.com	3720	758	1140	0.2038	9
SS,Gopal Ganj	www.ssgopalganj.in	2070	410	527	0.1981	10
SS, Amaravathi Nagar	www.sainikschoolamaravathinagar.edu.in	20300	3210	3620	0.1581	11
SS, Tilaiya	www.sainikschooltilaiya.org	7370	961	1200	0.1304	12
SS, Goalpara	www.sainikschoolgoalpara.org	3050	390	438	0.1279	13
SS, Nagrota	www.sainikschoolnagrota.com	18600	2330	4290	0.1253	14
SS, Balachadi	www.ssbalachadi.org	6120	708	271	0.1157	15
SS, Ghorakal	www.ssghorakhal.org	3540	401	564	0.1133	16
SS, Kazhakootam	www.sainikschooltvm.nic.in	11500	1050	1820	0.0913	17
SS, Sujanpur Tira	www.sainikschoolsujanpurtira.org	3080	192	232	0.0623	18
SS, Kodagu	www.sainikschoolkodagu.edu.in	5760	319	479	0.0554	19
SS, Chittorgarh	www.sschittorgarh.com	4800	259	150	0.054	20
SS, Punglwa	www.sainikschoolpunglwa.nic.in	1230	38	91	0.0309	21
SS, Bijapur	www.ssbj.in	157000	2060	27200	0.0131	22
SS, Nalanda	www.sainikschoolnalanda.bih.nic.in	10500	110	765	0.0105	23
SS, Ambikapur	www.sainikschoolambikapur.org.in	13400	65	113	0.0049	24
SS, Rewari	www.ssrw.org	157000	170	7360	0.0011	25

Table 6: Spearman's Rank Correlational Coefficient

Sl. No	URLs	R-WIF (X)	WIF (Y)	X^2	Y^2	XY
1	www.sainikschoolkorukonda.org	1.0497	2.1958	1.10187	4.821538	2.304931
2	www.kalikirisainikschool.com	0.5084	1.3193	0.258471	1.740552	0.670732
3	www.sainikschoolgoalpara.org	0.1279	0.2715	0.016358	0.073712	0.034725
4	www.ssgopalganj.in	0.1981	0.4527	0.039244	0.204937	0.08968
5	www.sainikschoolnalanda.bih.nic.in	0.0105	0.0833	0.00011	0.006939	0.000875
6	www.sainikschoolambikapur.org.in	0.0049	0.0133	0.000024	0.000177	0.000065
7	www.ssbalachadi.org	0.1157	0.16	0.013386	0.0256	0.018512

8	www.sskunjpura.org	0.2284	0.4949	0.052167	0.244926	0.113035
9	www.ssrw.org	0.0011	0.048	0.000001	0.002304	0.000053
10	www.sainikschoolnagrota.com	0.1253	0.3559	0.0157	0.126665	0.044594
11	www.sainikschoolsujanpurtira.org	0.0623	0.1377	0.003881	0.018961	0.008579
12	www.sainikschooltilaiya.org	0.1304	0.2932	0.017004	0.085966	0.038233
13	www.ssbj.in	0.0131	0.1864	0.000172	0.034745	0.002442
14	www.sainikschoolkodagu.edu.in	0.0554	0.1385	0.003069	0.019182	0.007673
15	www.sainikschooltvm.nic.in	0.0913	0.2496	0.008336	0.0623	0.022788
16	www.sainikschoolrewa.ac.in	0.4241	0.6166	0.179861	0.380196	0.2615
17	www.sainiksatara.org	0.485	1.1678	0.235225	1.363757	0.566383
18	www.ssimphal.nic.in	0.4246	0.6369	0.180285	0.405642	0.270428
19	www.sainikschoolpunglwa.nic.in	0.0309	0.1049	0.000955	0.011004	0.003241
20	www.sainikschoolbhubaneswar.org	0.2715	0.5615	0.073712	0.315282	0.152447
21	www.sskapurthala.com	0.5778	1.5899	0.333853	2.527782	0.918644
22	www.sschittorgarh.com	0.054	0.0852	0.002916	0.007259	0.004601
23	www.sainikschoolamaravathinagar.edu.in	0.1581	0.3365	0.024996	0.113232	0.053201
24	www.ssghorakhal.org	0.1133	0.2726	0.012837	0.0743111	0.030886
25	www.sainikschoolpurulia.com	0.2038	0.5102	0.041534	0.260304	0.103979
Total ∑		5.4656	12.2822	2.615967	12.927273	5.722227

7.0 Spearman's Rank Correlational Co-efficient

Spearman's Rank correlational co-efficient (r) is used to establish the association or closeness in ranking based on WIF and R-WIF. The co-efficient can be calculated using the following formula.

$$(r) = \frac{N\sum XY-(\sum X) + (\sum Y)}{Sqrt\ ([N\sum X^2-(\sum X)^2][N\sum Y^2 - (\sum Y)^2])}$$

Here, N = 25, $\sum XY$ = 5.72, $\sum X$ = 5.47, $\sum Y$ = 12.28, $\sum X^2$ = 2.62, $\sum Y^2$ = 19.93,

$(\sum X)^2$ = 29.92 and $(\sum Y)^2$ = 150.8

$$Therefore,\ r = \frac{(25 \times 5.72) - (5.47 \times 12.28)}{Sqrt\ ([25 \times 2.62-29.92] [25 \times 12.93-150.8)}$$

$$= \frac{143 - 67.17}{Sqrt.\ (35.58 \times 172.45)}$$
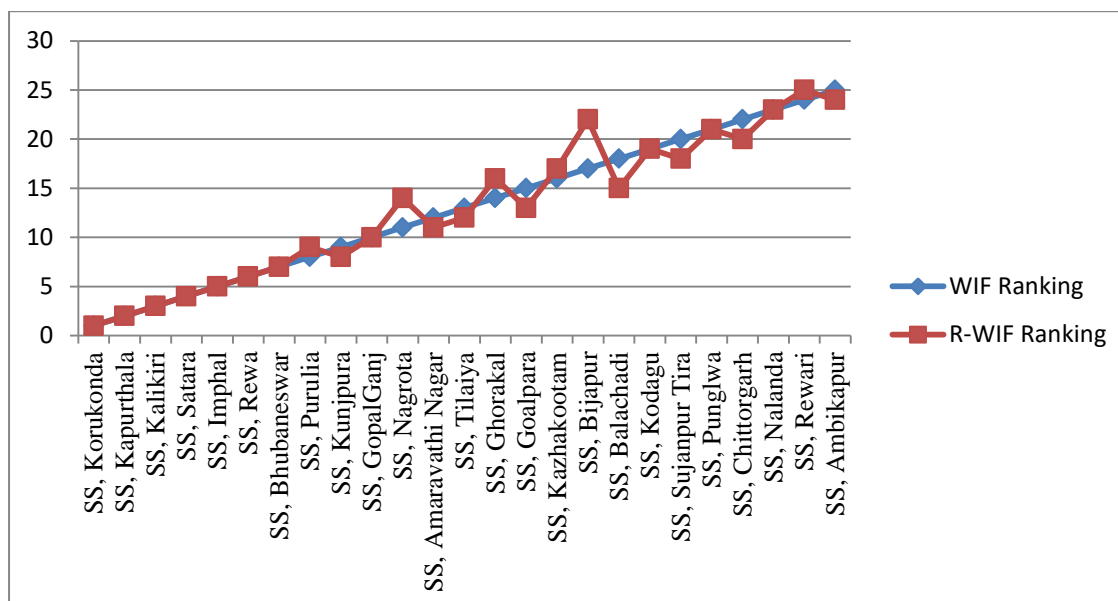
$$= \frac{75.83}{78.331}$$

$$= 0.968$$

$$= = =$$

Figure 1: Comparison of Ranking of Sainik School Websites Based on WIF and R-WIF

8.0 Conclusion

Link analysis is an area in webometrics, which can be used to analyse web presences of websites by extracting different kinds of link information. The present study throws light on web presence of Sainik Schools in India. The link analysis of websites of Sainik Schools in India shows that the ranking based on WIF and R-WIF are having similarity with each other. Also Spearman's Rank Correlational Coefficient is positive which shows that, there exists much association or closeness between rankings based on WIF and R-WIF.

9.0 References

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