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Full Length Research

Websites of Engineering colleges: a Webometric Analysis

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Webometrics is concerned with measuring aspects of the web, web pages, parts of web pages. This study examines 21 engineering colleges affiliated to Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. It Investigates the domain systems of the websites, analysis the number of web pages and link pages and calculates the simple web impact factor, self link web impact factor, external link web impact factor and revised web impact factor and ranks the websites as per the Web Impact factor.

Keywords: Engineering Colleges, webometrics, link analysis, web impact factor.

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INTRODUCTION

The globalization has made a remarkable impact on the academic education system and the internet is the constant source of energy for the institute to make its facilities and opportunity available globally. The easiest and effective way to achieve a goal, there is need to have website of each academic institute to perform well and stay in the competition.

A website is the collection of related web pages, images, videos that are addressed relative to a common Uniform Resource Locator (URL). People visit the website to get information. Therefore the primary goal of the institute's websites is to prove information to its user. Prospective student may use college website for choice their admission, to find out a particular course offered. Some students may download the application form and prospectus. Some teachers may search for job vacancy. Thus college website may be used for a wide variety of purposes.

Since teachers, students and general public are interested to know the ranking of the colleges an attempt has been taken in this study to rank all the engineering colleges under Dr. Babasaheb Ambedkar Marathwada University with the help of appropriate webometric indicators.

Concept of webometrics

The term webometrics is derived from two words "web" and "metrics". The word is a short form of www. The dictionary of science defines web as a hypermedia system that allows users to view and retrieve information from documents containing links. Webster's comprehensive Dictionary of English Language defines metrics as, "the mathematical theory of measurement".

Table 1: Classification of Engineering colleges under Dr. BAMU by year of their establishment

Year of establishment	No of Engineering Colleges	Percentage
Between 1951 and 1960	1	4.76
Between 1961 and 1970	0	0.00
Between 1971 and 1980	0	0.00
Between 1981 and 1990	4	19.05
Between 1991 and 2000	3	14.29
Between 2001 and 2010	13	61.90
Total	21	100.00

Webometrics is a quantitative study of web-related phenomena. The webometric study could be applied to web with commercial search engines providing the raw data.

Engineering Colleges

Technical education in India contributes a major share to the overall education system and plays a vital role in the social and economical development of our nation.

All India Council for Technical education (AICTE) was set up in November 1945 as a national level apex Advisory Body to conduct the survey on the technical education. Engineering colleges are set up by an act as per AICTE.

Directorate of Technical Education is responsible for post graduate, graduate and diploma level institutions in engineering and technology, Architecture, pharmacy and management in the state.

Currently there are 21 engineering colleges affiliated to Dr. Babasaheb Ambedkar Marathwada University. It can be hoped that there would be more engineering colleges in future.

Table 1. Depicts the year of establishment of 21 engineering colleges affiliated to Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. There was a phenomenal growth during 2001-2010; nearly 13 (61.90per cent) engineering colleges were established during this period. Government College of Engineering was the first engineering college established in 1960. In the last 21 years about 16 engineering colleges have been established which reflects the growth of higher education in Aurangabad.

LITERATURE REVIEW

Jeyeshankar, Ramesh Babu, and Nageswara (2010) examines the 40 central universities website in India. Investigates domain system of the websites, analysed the number of the web pages and link pages and calculated the simple web impact factor, self link web impact factor, external link web impact factor and revised web impact factor for Central Universities in India and ranks the websites as per the Web Impact Factor. Boell, Wilson and Cole (2008), analyzed Australian Universities. They describe how search engines works for efficient data gathering for Webometric study using predictable URLs.

Owen and Willett(2009), describe a Webometric analysis of the linkages (situations) to websites associated with departments of librarianship and information science.

Jalal, Biswas and Mukhopadhyay(2009), studied the webometric analysis of central universities in India. They used Yahoo and Google search engines using special query syntax. Result revealed that University of Delhi becomes top rank and Sikkim University occupied the last.

Jeyeshankar, Ramesh Babu and Gopalkrishnan (2009), examined websites of 45 universities in Tamil Nadu comprising 27 state universities and 18 private universities.

Jalal , Biswas and Mukhopadhyay(2010), tried to explore the possibilities of research in the field of webometrics in the educational institutions in India using Web Impact Factor(WIF). They investigate the effectiveness and relevance of web impact factors (WIFs) for Indian Universities websites. Reviews web impact factor as to how this link-based metrics is developed and is applied.

Liwen Vaughan and justin You (2010), proposed a new Webometrics concept that is based on words rather than in links on webpages. Webpages were collected from Google and Google Blog.

Thelwall and Sud(2012), describe Bing search API 2.0 the only major international web search engine data source available automatic offline processing for

webometric research.

OBJECTIVE OF THE STUDY

The objectives of the studies are:

1) To identify and classify the domain of engineering colleges websites in Aurangabad.
2) To find the number of webpages, number of link pages, number of self link pages and external link pages of engineering colleges websites in Aurangabad.
3) To measure the simple WIF, self link WIF, external WIF and revised WIF of engineering colleges websites in Aurangabad and rank them as per the WIF.

Hypotheses

The following are the hypotheses framed for this study:

1) A majority of Engineering Colleges in Aurangabad Hosted websites on the internet.
2) The domain structures of websites of these colleges are heterogeneous.
3) Higher the number of webpages, smaller the link pages; and the greather the WIF, smaller the number of webpages.

SCOPE

This study makes the analysis of engineering colleges affiliated to Dr. Babasaheb Ambedkar Marathwada University Aurangabad. There are 21 engineering colleges. One Shri Sai College of Engineering which do not have website. One Naganathappa Halge Engineering college which have website but it's not working. Therefore the present study examined the websites of 19 engineering colleges under Dr. Babasaheb Ambedkar Marathawada University.The study aimed at to establish a kind of academic ranking of these websites by measuring their WIF. The study of the ranking will help the reader to compare and identify engineering college's website by their WIF.

METHODOLOGY

1) The study used Google search engine for collection data. For collecting the information about engineering colleges http://www.dte.org.in this website was use. This website is belongs to Directorate of Technical Education, Maharashtra State which gives all the information about the list of the engineering colleges in Maharashtra with their websites. It also gives the information about Admission, Eligibility, Scholarship scheme and technical degree and diploma courses being offered at the colleges in the State.

2) To find out the number of webpages of the particular website there is website on the google i.e. http://www.xml-sitemaps.com. This website creates a sitemaps, those sitemaps were use to count the number of webpages of the given website. For that we have to type the URL in the textbox and click on "START". It will count the total number of webpages of that URL.

3) For counting the internal and external links http://rapid.searchmetrics.com/en/seo-tools/link-tools/outbound-links,50.html,result#r,result#r this website is used. It gives the total number of internal as well as external links of given website.

4) For counting Backlinks-the webpages that links to your website, the following website was use. http://www.freetools.submitplus.org/tools/link-popularity-checker It counts the total number of webpages that link to your website.

Web Impact Factor

Web Impact Factor is a part of the methodology in webometric studies. It is a form of measurement used to determine the relative standing of websites of particular fields. The higher the WIF, the greater the reputation of the website. The idea of applying revised WIF techniques of the web was proposed by Noruzi. According to them, WIF is defined as the ratio of links made to a website to the number of pages at the website. The WIF provides quantitative tools for ranking, evaluating, categorizing and comparing websites.

Four types of links and WIF formulated in the following way:-

1) The simple WIF: The ratio of all links to the number of pages.
2) The self link WIF: The ratio of self links within the site to the number of pages.
3) The external WIF: the ratio of links made from external sites to the target site.
4) The revised WIF: the ratio of links made incoming from other sites.

Table 2 reveals that seven types of 'domain extension' are observed in this study. Most of the colleges have '.org' (42.11per cent) extension, followed by '.ac.in' (21.05per cent). '.asia', '.com' and '.org.in' extensions (10.53 per cent) each. Only one college used '.net' (5.26 per cent) extension.

Table 2 :- Classification of Engineering colleges website's by the domain extension

Domain	No of Engineering Colleges	Percentage
.ac.in	4	21.05
.asia	2	10.53
.com	2	10.53
.net	1	5.26
.org	8	42.11
.org.in	2	10.53
Total	19	100.00

Table 3:- Simple web impact factor for Engineering colleges affiliated to Dr. BAMU

Name Of Engineering College	**No of webpages (NWP) (A)**	**No of Linked webPages (LWP) (B)**	**Simple Web impact factor (SWIF) (B/A)**	**Ranked by SWIF**
Shreeyash College of Engineering	24	46	1.92	1
Aurangabad College Of Engineering, Naygaon Savangi	15	28	1.87	2
L.E.C.T.Savitribai Phule Women's Engineering College	11	11	1.00	3
Veermata Jijau Women's Engineering College	11	11	1.00	4
P.E.S.'s College of Engineering	49	43	0.88	5
Shree Tuljabhavani College of Engineering	69	43	0.62	6
Marathwada Shikshan Prasarak Mandal's Group Of institution	127	55	0.43	7
University Departmental of Chemical Technology	500	176	0.35	8
Aditya Engineering College	18	6	0.33	9
B.G.P.S.Hi-Tech Institute of Technology	66	21	0.32	10
Matsyodari Shikshan Sansath's College of Engineering & Technology	95	30	0.32	11
Terna Public Charitable Trust's College of Engineering	55	14	0.25	12
K.T. Patil College Of Engineering & Technology	58	14	0.24	13
G.S.Mandal's Maharashtra Institute of Technology	212	47	0.22	14
Marathwada Institute of Technology	212	47	0.22	15
Government College of Engineering	348	53	0.15	16
M.B.E.Society's College of Engineering	67	9	0.13	17
M.G.M.Jawaharlal Nehru Engineering College	285	32	0.11	18
Everest Education Society, Group Of Institutions	197	16	0.08	19

Table 3. illustrate the rank distribution of engineering colleges under Dr. Babasaheb Ambedkar Marathwada University according to their simple web factor (SWIF) Dividing the number of link pages (B) by the number of wepages (A), the SWIF of each college has been calculated. Shreeyash college of Engineering occupied the first place with 46 link and 24 webpages with 1.92 SWIF. The second and third place goes to Aurangabad college of Engineering and L.E.C.T. Savitribai Phule Women's Engineering College respectively. University Department of Chemical Technology (500) and Government college of Engineering (348) have more

Table 4:- Self-Link web impact factor for Engineering colleges affiliated to Dr. BAMU

Name Of Engineering College	No of webpages (A)	No of self Link webPg. (C)	Self-link Web impact factor (SLWIF) (C/A)	Ranked by SLWIF
Aurangabad College Of Engineering, Naygaon Savangi	15	27	1.80	1
Shreeyash College of Engineering	24	29	1.21	2
L.E.C.T.Savitribai Phule Women's Engineering College	11	11	1.00	3
Veermata Jijau Women's Engineering College	11	9	0.82	4
P.E.S.'s College of Engineering	49	38	0.78	5
Shree Tuljabhavani College of Engineering	69	42	0.61	6
Marathwada Shikshan Prasarak Mandal's Group Of institution	127	55	0.43	7
Aditya Engineering College	18	6	0.33	8
University Department of Chemical Technology	500	162	0.32	9
Matsyodari Shikshan Sansath's College of Engineering & Technology	95	29	0.31	10
B.G.P.S.Hi-Tech Institute of Technology	66	20	0.30	11
K.T. Patil College Of Engineering & Technology	58	13	0.22	12
Terna Public Charitable Trust's College of Engineering	55	11	0.20	13
G.S.Mandal's Maharashtra Institute of Technology	212	40	0.19	14
Marathwada Institute of Technology	212	40	0.19	15
Government College of Engineering	348	50	0.14	16
M.B.E.Society's College of Engineering	67	8	0.12	17
M.G.M.Jawaharlal Nehru Engineering College	285	23	0.08	18
Everest Education Society, Group Of Institutions	197	15	0.08	18

numbers of webpages than the above three colleges, but they are ranked 8th and 16th position respectively based on their SWIF.

The ranking of engineering colleges under Dr. Babasaheb Ambedkar Marathwada University is based on their self link Web Impact Factor as shown in the Table 4. Aurangabad College of Engineering occupies the first place with 27 self link pages and 15 web pages with 1.80 SLWIF. Shreeyash College of Engineering and L.E.C.T. Savitribai women's Engineering College are ranked at 2nd and 3rd places with SLWIF of 1.21 and 1.00 respectively. Matsyodari Shikshan Sansath's College of Engineering and Technology ranked 10th place with 29 self link pages and 95 web pages with 0.31 SLWIF.

Though University Department of Chemical Technology has more number of webpages than all the other colleges it occupies the 9th position because the number of self link pages is very less as compared to its webpages and its SLWIF is 0.32. Further Jawaharlal Nehru Engineering College and Everest Education Society share the 18th position with SLWIF as 0.08.

Table 5. shows the rank distribution of Engineering colleges under Dr. Babasaheb Ambedkar Marathwada University according to their external link WIF (ELWIF). Shreeyash College of Engineering occupies the first place with 24 webpages,17 link pages and with ELWIF 0.71. Veermata Jijau Women's Engineering College is in the 2nd position with ELWIF 0.18. P.E.S.College of Engineering is ranked 3rd position with ELWIF 0.10. Aurangabad College of Engineering are positioned at the

Table 5 :- External Link web impact factor for Engineering colleges affiliated to Dr. BAMU

Name Of Engineering College	No of webpages (A)	No of external Link webPg. (D)	External link Web impact factor (ELWIF) (D/A)	Ranked by ELWIF
Shreeyash College of Engineering	24	17	0.71	1
Veermata Jijau Women's Engineering College	11	2	0.18	2
P.E.S.'s College of Engineering	49	5	0.10	3
Aurangabad College Of Engineering, Naygaon Savangi	15	1	0.07	4
Terna Public Charitable Trust's College of Engineering	55	3	0.05	5
G.S.Mandal's Maharashtra Institute of Technology	212	7	0.03	6
Marathwada Institute of Technology	212	7	0.03	7
M.G.M.Jawaharlal Nehru Engineering College	285	9	0.03	8
University Department of Chemical Technology	500	14	0.03	9
K.T. Patil College Of Engineering & Technology	58	1	0.02	10
B.G.P.S.Hi-Tech Institute of Technology	66	1	0.02	11
M.B.E.Society's College of Engineering	67	1	0.01	12
Shree Tuljabhavani College of Engineering	69	1	0.01	13
Matsyodari Shikshan Sansath's College of Engineering & Technology	95	1	0.01	14
Government College of Engineering	348	3	0.01	15
Everest Education Society, Group Of Institutions	197	1	0.01	16
Marathwada Shikshan Prasarak Mandal's Group Of institution	127	0	0.00	17
Aditya Engineering College	18	0	0.00	18
L.E.C.T.Savitribai Phule Women's Engineering College	11	0	0.00	19

4th place with the ELWIF 0.07.Everest Education Society , Group of Institute ranked 16th position with 197 web pages but only 1 link page with ELWIF 0.01.

Marathwada Shikshan Prasarak Mandal's Aditya Engineering College and L.E.C.T. Savitribai Phule women's Engineering College do not have external link pages ,so they occupied last place.

The data in table 6 exhibits the rank distribution of Engineering Colleges of Dr. Babasaheb Ambedkar Marathwada University according to their revised Web Impact Factor(RWIF).P.E.S. College of Engineering ranked first with 49 webpages,8inlinks pages and RWIF16.33.Terna Public Charitable Trust's College of Engineering occupied 2nd with 55 web pages, 4 in links pages and RWIF 7.27. B.G.P.S.Hi-tech Institute of Technology occupied 3rd positions with 66 web pages, 4 in links pages and RWIF 6.06 M.G.M .Jawaharlal Nehru Engineering College ranked 9th place with 197 web pages, 2 in links pages and RWIF o.70.Last 10 colleges do not have revised link so they occupied last positioned.

CONCLUSION

This study gives the fair idea about the information provided by websites of 21 engineering colleges in Aurangabad .Engineering colleges have a good web presence in general. All this colleges were having total of 2419 web pages. It means that each college's average number of webpages is 115. Therefore it seems that

Table 6:- Revised Link web impact factor for Engineering colleges affiliated to Dr. BAMU

Name Of Engineering College	No of webpages (A)	No of Links incoming from other websites (E)	Revised link Web impact factor (RWIF) (E/A)	Ranked by RWIF
P.E.S.'s College of Engineering	49	8	16.33	1
Terna Public Charitable Trust's College of Engineering	55	4	7.27	2
B.G.P.S.Hi-Tech Institute of Technology	66	4	6.06	3
University Departmet of Chemical Technology	500	23	4.60	4
Matsyodari Shikshan Sansath's College of Engineering & Technology	95	4	4.21	5
Government College of Engineering	348	8	2.30	6
G.S.Mandal's Maharashtra Institute of Technology	212	3	1.42	7
Marathwada Institute of Technology	212	3	1.42	8
M.G.M.Jawaharlal Nehru Engineering College	285	2	0.70	9
Everest Education Society, Group Of Institutions	197	0	0.00	10
Shreeyash College of Engineering	24	0	0.00	11
Marathwada Shikshan Prasarak Mandal's Group Of institution	127	0	0.00	12
Shree Tuljabhavani College of Engineering	69	0	0.00	13
M.B.E.Society's College of Engineering	67	0	0.00	14
Aditya Engineering College	18	0	0.00	15
L.E.C.T.Savitribai Phule Women's Engineering College	11	0	0.00	16
Veermata Jijau Women's Engineering College	11	0	0.00	17
K.T. Patil College Of Engineering & Technology	58	0	0.00	18
Aurangabad College Of Engineering, Naygaon Savangi	15	0	0.00	19

Engineering colleges of Dr. Babasaheb Ambedkar Marathwada University have made remarkable progress in developing their website. These finding open the door to further studies of other new area of web.

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