
Web Presence of Selected Asian Countries: A Webometric Study

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The paper focuses on the Web presence and visibility of websites of Asian countries. The paper tries to highlight the Web presence using some webometric indicators like Internet access, webpages, number of Internet users, and link counts. The study analyzes the web presence using popular search engines like Altavista, Google, Yahoo and MSN. An attempt has also been made to find out the Web Impact Factor (WIF) for selected Asian countries. The result shows that China (43.7%), Japan (16.2%) and India (10.4%) occupy highest web presence amongst Asian countries based on the total number of effective Internet users. China being the second highest number of Internet users having 11.8% after USA (19.7%) followed by India with 4.9% of world Internet Users and Japan is having the highest number of webpages followed by China and South Korea.

Keywords: Web Presence, Visibility, Web Impact Factor, Asian Countries, Domain Structure, Link Analysis, Webometric Study

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1. Introduction

The Web is a reflection of human culture, a massive socio-cultural network of Web resources authored by millions of people and organization around the world. The present study focuses on the studies of Web presence of Asian countries with respect to various Webometric indicators like number of Internet users, number of external links, number of webpages, number of domain names, etc. The present study concentrates on the Web presence and calculation of the Web Impact Factor (WIF) for top-level domain (TLD) and sub-level domain (SLD) for academic and educational institutions in these countries. It also studies the external links for the calculation of revised WIF using AltaVista search engine.

Noruzi [1] investigates the Web presence of country code top-level domains (ccTLDs) of European and Middle-Eastern countries. He attempted to count the web pages from European and Middle-Eastern countries collected from the output of the Yahoo search' engine. This study showed that European and Middle-Eastern countries with a higher number of Internet users have a higher web presence. The results show that the European countries, especially Germany, the United Kingdom and Italy, have the highest web presence, while the Middle-Eastern countries, apart from Turkey, Israel and Iran, have the lowest web presence. Specific features of countries may affect a country's web presence, for example linguistic reasons. Nandasara [2]

showed that Kazakhstan and Azerbaijan respectively have the highest webpage size per 1000 population among Central Asian countries. Park & Thelwall [3] made a study on Web science communication in the age of globalization showing links among universities websites in Asia and Europe.

Since mid 1990s, there has been lot of efforts to study the structure and characteristics of the Web by itself, web contents; links and web search engines using new informetric methodologies. Several studies show that web sites can be compared and ranked in different domains based on their impact factors. In 1998, Ingwersen [4] calculated the web impact factor for some Danish domains and websites. He used AltaVista for his study because he believed this search engine covers broad area of the web and provides sufficient information for webometric studies.

The easiest way of measuring Web presence of countries is with the help of large-scale search engines such as Yahoo, Google, AltaVista with its power of advanced search facilities in webometric research. The web presence of Asian countries is a helpful tool to judge the 'digital divide' between the rich and the poor countries in terms of the utilization of Information and Communication Technologies (ICTs) of the countries.

2. Literature Review

It is true that millions of people and organizations around the world depend on the Web for their daily life and for information exchange. The WWW has gained popularity largely because of its ease of use and multimedia capabilities, as well as its convenient access to other types of Internet services. The Web is the fastest medium for transferring information and has universal reach crossing geographical and time boundaries. It is also easy to access information from millions of Web sites using search engines. The number of domains from 16,300 in July 1992 increased to 30,000,000 in July 2001 (Gromov [5]).

Thelwall and Wilkinson [6] attempted to find out similar academic websites using links, bibliometric couplings and co-links. They did an experiment with a random sample of 500 pairs of domains from the UK academic domains to find out the similar academic websites. The result showed that using a combination of all three (links, colinks and couplings) gave surprisingly marginal improvement over links alone of identifying similar academic websites.

Aguillo, *et al.*, [7] have shown the analysis of Web presence of the universities by means of cybermetric indicators. The developing countries in Latin America are making a great effort for publishing electronically their academic and scientific result. The authors have studied the Brazilian universities regarding web presence, web visibility and domain size. It showed that there is a tremendous increase in the commitment of the Brazilian universities to the web. The paper described the co-link maps of 167 Brazilian academic institutions.

Mukhopadhyay [8] had tried to explore the possibility of research in the field of Webometrics in the educational institutions in India using Web Impact Factor (WIF). He ranked the Indian Institute of Technology (IITs) and Indian Institute of Management (IIMs) systems based on the calculation of WIF.

Mukhopadhyay [9] in his study showed the results of Webometric investigation at different levels of domain name system. His study is based on the hyperlink analysis. He calculated Web Impact Factors for cc TLDs of SAARC countries; Sub Level Domains (SLD) related to academic and research institutes registered under Indian ccTLD and hosts under IIT and IIM educational system in India.

Since Web had been flourished first in developed countries and its influence came gradually in developing countries. Therefore, there is a huge gap in Web presence among American, European and Asian Countries. Web presence and Web Impact Factor for middle-east countries (Noruzi [10]) reflects that Turkey, Israel and Iran occupy the highest Web presence amongst middle-east countries. Mukhopadhyay had shown the ranking of SAARC countries using external- WIF.

3. Objectives of the Study

- (1) To know the volume of webpages of Asian countries indexed by AltaVista search engine.
- (2) To compare the web presence of Asian countries and rank them on the basis of appropriate webometric indicators.

- (3) To calculate revised Web Impact Factor (WIF) for ccTLD of select Asian countries in order to rank them.
- (4) To find out the variation of webpage growth among selected Asian countries on the Web Space.

4. Domain Structure

A domain name is a unique name assigned for a website. All websites are identified by their names called Domain Name. For example, google.com, yahoo.com, bitmesra.ac.in etc. are few of them. The domain names are of the syntax - name followed by a dot (.) followed by the extension. In October 1984, seven generic top-level domains (gTLDs, including .com, .net, .org and .gov) have been established to provide domain space for corporations, non-profits, schools, networks, US government offices and the US military. Network Solution Inc. (NSI) and National Science Foundation (NSF) sign Cooperative Agreement granting NSI authority to manage Domain Name System (DNS) registration and database. The Domain Name System (DNS) translates the language address (i.e. www.buruniv.ac.in) into a corresponding IP address (144.16.192.17). From right hand side, the domain name structure has following hierarchy: (a) Top level domain, (b) Second level domain; (c) Host level domain.

- **Top Level Domain (TLD):** For example, **.in** represents for India; **.jp** for Japan etc. There are three categories of TLD such as: (i) Generic Top Level Domain (gTLD), (ii) Country Code Top Level Domain (ccTLD) and (iii) International Top Level Domain (iTLD). The gTLDs are **.com**, **.net**, **.org** under Open Category and **.gov**, **.edu**, **.mil** under restricted category. The ccTLD relates to different countries and their names abbreviations defined by the International Standard Organization (ISO)-3166 standard. Example of ccTLD for India is **.in**. The iTLD **.int** implied for International Organization like ILO (International Labor Organization), WHO (World Health Organization etc. Following table shows some new gTLDs introduced in Nov 2000 by Internet Corporation for Assigned Names and Numbers (ICANN).
- **Second Level Domain (SLD):** Generally, SLDs refer to the organization that registered the domain name with the registrar. Some domain name registries introduce a second-level hierarchy to a TLD that indicates the type of organization intended to register an SLD under it. For example, in the **.in** namespace a college or other academic institutions would register under the **.ac.in**, while companies would register under **.co.in**.
- **Host-level domain:** For example, University of Delhi is represented as www.du.ac.in domain name.

Table 1
History of TLDs and their descriptions

Type	TLDs	Description
Historic gTLD	.arpa	relates to machines from the original network;
Historic gTLD	.com	related to companies with a commercial purpose
Historic gTLD	.gov	relates to governmental organisations
Historic gTLD	.int	relates to international organisations
Historic gTLD	.edu	relates to military organisations
Historic gTLD	.net	related to organisations dealing with the networks
Historic gTLD	.org	relate to not for profit organisations
New gTLD	.aero	relates to the aeronautical industry
New gTLD	.biz	relating to commercial companies
New gTLD	.museum	relating to museums
New gTLD	.name	relating to the name of people or imaginary people
New gTLD	.info	organisations dealing with information
New gTLD	.coop	relating to cooperatives
New gTLD	.pro	relating to liberal professions
Special TLD	.arpa	relates to the network management infrastructures

Source: http://en.wikipedia.org/wiki/List_of_Internet_top-level_domains

5. Methodology

5.1. Selection of countries

Initially, all the 45 countries [11] in Asian continent had been taken into consideration and then each country's webpages has been calculated using AltaVista search engines with the command `site:cn`, where `.cn` stands for TLD of China. All countries have been ranked based on total number of webpages and then only top 20 countries have been selected for our present studies.

5.2. Selection of Search Engines

AltaVista, Google and Yahoo! are potential search engines for data collection. Data such as web pages and link data are collected during the specified period as mentioned in the respective table source. As Google has bigger index size so it would be quite reasonable to use Google for retrieving the volume of web pages (i.e. size). It is to be noted that Google is not suitable for collecting link data as because it doesn't support the *linkdomain* command, or it doesn't give proper result. As we know that AltaVista is being acquired by Yahoo! so it would be wiser to use Yahoo! as data collection tool because of its wide spectrum of data source. In the case of Scholar value and Rich File, the Google Scholar and Google in general are used to retrieve the data for the selected set of countries under study.

5.3. Choice of Indicators

Web activity is multi-dimensional and is reflected through its web presence. So, the best way to build the ranking is combining a group of indicators that measure these different aspects. Almind & Ingwersen [12] proposed the first Web indicator, Web Impact Factor (WIF), based on link analysis that combines the number of external inlinks and the number of pages of the website, a ratio of 1:1 between visibility and size. This ratio was used for the ranking but adding two new indicators to the size component: (a) Number of documents, measured from the number of rich files in a web domain, and (b) number of publications being collected by Google Scholar database. Therefore, four indicators suggested by WISER [13] are as follows:

- **Size (S).** Number of pages recovered from four engines: Google, Yahoo, Live Search and Exalead. For each engine, results are log-normalised to 1 for the highest value. Then for each domain, maximum and minimum results are excluded and every institution is assigned a rank according to the combined sum.
- **Visibility (V).** The total number of unique external links received (inlinks) by a site can be only confidently obtained from Yahoo Search, Live Search and Exalead. For each engine, results are log-normalised to 1 for the highest value and then combined to generate the rank.
- **Rich Files (R).** After evaluation of their relevance to academic and publication activities and considering the volume of the different file formats, the following were selected: Adobe Acrobat (*.pdf*), Adobe PostScript (*.ps*), Microsoft Word (*.doc*) and Microsoft Power point (*.ppt*). These data were extracted using Google and merging the results for each file type after log-normalising in the same way as described before.
- **Scholar (Sc).** Google Scholar provides the number of papers and citations for each academic domain. These results from the Scholar database represent papers, reports and other academic items.

The four ranks were combined according to a formula [13] where each one has a different weight and the combined rank is: $\text{Webometrics Rank (position)} = 4 * \text{RankV} + 2 * \text{RankS} + 1 * \text{RankR} + 1 * \text{RankSc}$

5.4. Data Collection and Data Analysis

AltaVista, Yahoo and Google have been chosen to collect the data for the study. Data collection was performed during Feb 10-12, 2008 & Feb 18-19, 2009. All the domain names of Asian countries were searched to check their validity using Yahoo! Google and AltaVista database. For each of these countries, a search was carried out to determine the total number of links, total webpages, selflinks and inlinks using the following commands:

Table 2
Top 20 Asian countries based on web pages

SI No	Countries	TLD	No of Webpages (Feb 2008)	No of Webpage (Feb 2009)	% Growth	Inlinks	Selflinks	Total Links	Inlinks per 1000 webpages
1	Japan	.jp	383000000	535000000	39.69	276000000	487000000	766000000	51.59
2	China	.cn	161000000	236000000	46.58	253000000	219000000	486000000	107.2
3	South Korea	.kr	471000000	220000000	367.1	123000000	199000000	322000000	55.91
4	Taiwan	.tw	455000000	124000000	172.5	589000000	120000000	178000000	47.5
5	Vietnam	.vn	79600000	280000000	251.8	11400000	26800000	38200000	40.71
6	India	.in	36700000	124000000	237.9	32700000	10900000	43300000	263.7
7	Israel	.il	79600000	116000000	45.73	8600000	10700000	19300000	74.14
8	Turkey	.tr	78400000	112000000	42.86	18900000	10300000	29000000	168.8
9	Malyasia	.my	44800000	95000000	112.1	8390000	10300000	17200000	88.32
10	Singapore	.sg	39700000	83600000	110.6	11800000	7300000	19200000	141.1
11	Indonesia	.id	22500000	55800000	148	5300000	5080000	10500000	94.98
12	Philippines	.ph	27700000	40200000	45.13	5830000	3630000	9500000	145
13	Iran	.ir	22200000	30000000	35.14	2830000	2710000	5530000	94.33
14	Saudi Arabia	.sa	6200000	11500000	85.48	2670000	1040000	3730000	232.2
15	Kazakhstan	.kz	9480000	10700000	12.87	2240000	1010000	3250000	209.3
16	Pakistan	.pk	6980000	10400000	49	1390000	997000	2390000	133.7
17	UAE	.ae	4760000	9020000	89.5	2850000	829000	3670000	316
18	Armenia	.am	5860000	7720000	31.74	1720000	709000	2440000	222.8
19	Azerbaijan	.az	3790000	4440000	17.15	459000	412000	868000	103.4
20	Uzbekistan	.uz	3850000	3960000	2.857	339000	380000	722000	85.61

Source: AltaVista, Feb 10-12, 2008 & Feb 18-19, 2009

- The total number of webpages to ccTLD, China (for example), domain:cn
- The number of total links at the ccTLD, China (for example), linkdomain:cn
- The number of inlinks can be calculated using the command, linkdomain:cn –domain:cn
- The number of self-links can be measured using the formula, linkdomain:cn domain:cn

The above table shows that Japan is having top webpages followed by China and South Korea among Asian countries. South Korea also witnessed highest webpage growth i.e. 367 times within one year. India is having highest inlink (263.7) per 1000 webpages.

5.5. Top Level Link Analysis

Link analysis is the process of building up networks of interconnected objects through various relationships in order to discover pattern and trends. An attempt has been made to detect the structural and functional analysis of network connectivity using link analysis for top Asian countries. Network analysis usually used to understand organizational structure and function (Wasserman, *et al.*, [14]). Table 2 reflects that India is having highest number of inlinks per 1000 webpages therefore, it would be an interesting study to know how many links comes to India and goes from India to other Asian countries. The detailed is explained in the following table.

Table 3 reflects that Japan is giving maximum links to India and simultaneously getting highest links. Another remarkable finding is the success of South Korea and Taiwan web presence with respect to producing links to India and also received links from India. It has also been studied while taking into whole 45 Asian countries (detailed result is not shown here) that more than 17 countries have incoming and outgoing links is either zero (0) or less than 100.

Table 3
Countries that linked to and linked from Indian Domain

SI No	Countries	cc TLD	# Links to Indian domain	Search Command	Country	# links from Indian domain	Search Command
1	Japan	.jp	297000	linkdomain:in AND domain:jp	Japan	327000	Linkdomain:jp AND domain:in
2	China	.cn	30300	linkdomain:in AND domain:cn	China	104000	Linkdomain:cn AND domain:in
3	South Korea	.kr	72800	linkdomain:in AND domain:kr	South Korea	28200	Linkdomain:kr AND domain:in
4	Taiwan	.tw	43700	linkdomain:in AND domain:tw	Taiwan	31700	Linkdomain:tw AND domain:in
5	Israel	.il	7540	linkdomain:in AND domain:il	Israel	9170	Linkdomain:il AND domain:in
6	Vietnam	.vn	34400	linkdomain:in AND domain:vn	Vietnam	61900	Linkdomain:vn AND domain:in
7	Turkey	.tr	5330	linkdomain:in AND domain:tr	Turkey	29900	Linkdomain:tr AND domain:in
8	Malyasia	.my	40100	linkdomain:in AND domain:my	Malyasia	49700	Linkdomain:my AND domain:in
9	Singapore	.sg	78800	linkdomain:in AND domain:sg	Singapore	316000	Linkdomain:sg AND domain:in
10	India	.in	7100000	linkdomain:in AND domain:in	India	7100000	Linkdomain:in AND domain:in
11	Phillipines	.ph	32900	linkdomain:in AND domain:ph	Phillipines	45500	Linkdomain:ph AND domain:in
12	Indonesia	.id	14800	linkdomain:in AND domain:id	Indonesia	6720	Linkdomain:id AND domain:in
13	Iran	.ir	1680	linkdomain:in AND domain:ir	Iran	1460	Linkdomain:ir AND domain:in
14	Kazakhstan	.kz	594	linkdomain:in AND domain:kz	Kazakhstan	2940	Linkdomain:kz AND domain:in
15	Pakistan	.pk	3200	linkdomain:in AND domain:pk	Pakistan	4490	Linkdomain:pk AND domain:in
16	Soudi Arabia	.sa	497	linkdomain:in AND domain:sa	Soudi Arabia	252	Linkdomain:sa AND domain:in
17	Armenia	.am	1200	linkdomain:in AND domain:am	Armenia	1770	Linkdomain:am AND domain:in
18	UAE	.ae	2330	linkdomain:in AND domain:ae	UAE	269000	Linkdomain:ae AND domain:in
19	Uzbekistan	.uz	112	linkdomain:in AND domain:uz	Uzbekistan	351	Linkdomain:uz AND domain:in
20	Azerbaijan	.az	723	linkdomain:in AND domain:az	Azerbaijan	119	Linkdomain:az AND domain:in

Source: Yahoo! dated 28th March 2009

The above table explains generic top-level domain that links to and links from **.in** domain during February 2009.

The following table explains that out of 6 generic TLDs, **.com** domain is getting maximum links from Japan followed by China, South Korea and India. Also Japan is producing highest number of links to the **.com** domain.

Table 4
Generic TLD that links to and from .com domain [Dec, 2009]

SI No	Countries	TLD	Search Command	# links to .com domain	Search Command	# links from .com domain
1.	Japan	.jp	linkdomain:com AND domain:jp	36900000	linkdomain:jp AND domain:com	81500000
2.	China	.cn	linkdomain:com AND domain:cn	6450000	linkdomain:cn AND domain:com	37900000
3.	South Korea	.kr	linkdomain:com AND domain:kr	7990000	linkdomain:kr AND domain:com	23900000
4.	India	.in	linkdomain:com AND domain:in	5470000	linkdomain:in AND domain:com	21700000
5.	Taiwan	.tw	linkdomain:com AND domain:tw	3930000	linkdomain:tw AND domain:com	9160000
6.	Singapore	.sg	linkdomain:com AND domain:sg	3090000	linkdomain:sg AND domain:com	7320000
7.	Turkey	.tr	linkdomain:com AND domain:tr	634000	linkdomain:tr AND domain:com	4850000
8.	Malaysia	.my	linkdomain:com AND domain:my	4340000	linkdomain:my AND domain:com	4710000
9.	Israel	.il	linkdomain:com AND domain:il	1110000	linkdomain:il AND domain:com	4380000
10.	Philippines	.ph	linkdomain:com AND domain:ph	1270000	linkdomain:ph AND domain:com	3000000
11.	Vietnam	.vn	linkdomain:com AND domain:vn	4210000	linkdomain:vn AND domain:com	2600000
12.	Indonesia	.id	linkdomain:com AND domain:id	1280000	linkdomain:id AND domain:com	2320000
13.	UAE	.ae	linkdomain:com AND domain:ae	365000	linkdomain:ae AND domain:com	1060000
14.	Pakistan	.pk	linkdomain:com AND domain:pk	701000	linkdomain:pk AND domain:com	1050000
15.	Iran	.ir	linkdomain:com AND domain:ir	471000	linkdomain:ir AND domain:com	860000
16.	Saudi Arabia	.sa	linkdomain:com AND domain:sa	152000	linkdomain:sa AND domain:com	581000
17.	Armenia	.am	linkdomain:com AND domain:am	236000	linkdomain:am AND domain:com	509000
18.	Kazakhstan	.kz	linkdomain:com AND domain:kz	72200	linkdomain:kz AND domain:com	296000
19.	Azerbaijan	.az	linkdomain:com AND domain:az	78200	linkdomain:az AND domain:com	138000
20.	Uzbekistan	.uz	linkdomain:com AND domain:uz	39900	linkdomain:uz AND domain:com	69800

Source: Yahoo! dated 12-13 Dec, 2009

Following table shows that population and Internet users for Asian countries. It has been mentioned in table-8 that total number of Internet users (578538257) of Asia is 39.5% of World Internet users. Based on this, individual countries percentage of Internet users have been calculated and shown only in selected countries of Asia.

The following table reflects that Uzbekistan witnessed highest growth (23166.7 %) of Internet users during 2000 to 2008 followed by Pakistan with 12967%.

Table 5
Asia's Internet Usage and Population in 2008

SI No	ASIA	Population	Internet Users	Internet Users	(%) Users	User Growth
		(2008 Est.)	(Year 2000)	2008	in Asia	(2000-2008)
1	China	1330044605	22500000	253000000	43.70%	1024.40%
2	Japan	127288419	47080000	94000000	16.20%	99.70%
3	India	1147995898	5000000	60000000	10.40%	1100.00%
4	Korea, South	49232844	19040000	34820000	6.00%	82.90%
5	Indonesia	237512355	2000000	25000000	4.30%	1150.00%
6	Vietnam	86116559	200000	20159615	3.50%	9979.80%
7	Pakistan	167762040	133900	17500000	3.00%	12969.50%
8	Turkey	71892808	5600000	16000000	2.76%	185.71%
9	Taiwan	22920946	6260000	15400000	2.70%	146.00%
10	Malaysia	25274133	3700000	14904000	2.60%	302.80%
11	Philippines	92681453	2000000	14000000	2.40%	600.00%
12	Israel	7337000	2000000	5263146	0.44%	163.16%
13	Singapore	4608167	1200000	2700000	0.50%	125.00%
14	Uzbekistan	28268440	7500	1745000	0.30%	23166.70%
15	Kazakhstan	15340533	70000	1400000	0.20%	1900.00%
16	Azerbaijan	8177717	12000	1035600	0.20%	8530.00%
17	Sri Lanka	21128773	121500	771700	0.10%	535.10%
18	Kyrgyzstan	5356869	51600	750000	0.10%	1353.50%
19	Armenia	2968586	30000	172800	0.03%	476.00%
20	Turkmenistan	5179571	2000	70000	0.00%	3400.00%

Source: <http://www.internetworldstats.com>

5.6. Calculation of WIF

Web Impact Factor (WIF) is the web versions of Impact Factor. There are three types of WIFs: WIF-simple, WIF-revived and WIF-overall. The Web Impact Factor (WIF) provides quantitative tools for ranking, evaluating, categorizing and comparing websites, top-level domains and sub-level domains. Links to a site can be made from within the website or outside the website. The Impact Factor is a measure of frequency with which average article in a journal had been cited in a particular year or period. The WIF introduced by Ingwersen [4] is the ratio of the number of backlinks to a site, divided by the number of webpages at the site. The data for academic webpage of these selected Asian countries at sub-level domain can be calculated using the following formula.

Let,

A = Number of external backlinks to a given site

B = Number of Self-links to a given site

C = Total number of links to a site

D = Total number of Webpages to a particular site

Therefore, $WIF_R = A/D$. and $WIF_O = C/D$

Academic web sites in many countries are large multifaceted scientific instruments and communication device. The academic webpages are widely used to announce the existence and promotion of new projects, achievements of scholars, researchers, departments and institutions. Following table demonstrates the academic webpages of select Asian countries.

Table 6
Web Presence of Academic Web of Selected Asian Countries based on WIF-Rev.

SI No	Countries	Domain	WIFO (Overall)	No of Webpage (D)	Inlinks (A)	Selflinks (B)	Total Links (C)	WIFR (Revised)
1	Armenia	edu.am	3.13	1730	4320	1140	5410	2.5
2	China	ac.cn	2.25	2380000	4520000	1520000	5360000	1.9
3	Vietnam	ac.vn	2.45	31900	51600	22200	78200	1.62
4	Azerbaijan	edu.az	1.57	8670	11100	7340	13600	1.28
5	Saudi Arabia	edu.sa	0.8	879000	539000	464000	707000	0.61
6	Malaysia	edu.my	1.22	1130000	653000	700000	1380000	0.58
7	Indonesia	ac.id	1.09	1280000	587000	742000	1390000	0.46
8	Uzbekistan	edu.uz	0.59	8250	3320	5970	4870	0.4
9	Singapore	edu.sg	1.04	1670000	644000	892000	1730000	0.39
10	UAE	ac.ae	0.8	104000	40900	75100	83300	0.39
11	Israel	ac.il	0.66	2870000	1090000	1560000	1900000	0.38
12	Kazakhstan	edu.kz	0.59	6510	2410	3220	3810	0.37
13	Philippines	edu.ph	0.94	559000	204000	335000	528000	0.36
14	Pakistan	edu.pk	0.71	223000	53300	136000	159000	0.24
15	Turkey	edu.tr	0.66	2870000	637000	1670000	1880000	0.22
16	India	ac.in	0.57	1980000	413000	1030000	1130000	0.21
17	South Korea	ac.kr	0.86	25200000	4830000	11300000	21600000	0.19
18	Japan	ac.jp	0.92	30300000	5380000	22700000	27900000	0.18
19	Taiwan	edu.tw	0.64	45500000	6,880000	32800000	28900000	0.15
20	Iran	ac.ir	0.41	1210000	184000	609000	493000	0.15

Source: AltaVista, dated 25 Feb 2009

Many scholars in the field mentioned the reliability problem of ranking through WIF values. This is due to the fact that result of WIF is biased towards the small number of web pages as well as number of hyperlinks. In the case of our study, it is revealed from above table 5 that having only 1,730 web pages Armenia occupied the top position followed by China based on revised web impact factor. Besides, Azerbaijan also got the 4th position due the low-webpage (i.e. 8670). Taiwan is not having any webpage under the sub level domain ac.tw whereas under edu.tw reported 45,500,000 numbers of pages. Turkey is having zero webpages under the sub-level domain: ac.tr. The result is obviously biased due to the defect of the WIF calculation as it depends on total number of webpages and total number of links. If the number of webpages is comparatively low then the value of WIF will be more and it will influence the ranking, which may not be actually true. Therefore, to get an unbiased result, we should search for alternative ranking. Here, we have followed WISER method that may yield more suitable and reliable result.

5.7. Ranking of Selected Asian Countries based on WISER

An attempt has been taken to rank the selected Asian countries using appropriate webometric indicators. The detail of the indicators is already explained in the choice of indicator section 5.3. Following table shows the webpage, visibility, rich file, Google scholar value and assigning appropriate weighted, we have calculated the index value, and based on the index value webometric rank has been assigned to these countries.

The above calculation is done based on webometric data and using WISER formula [13]. Data have been collected during the period: 18-19 February with the help of AltaVista and using Google & Google Scholar dated March 18-19, 2009. It is revealed from the above table that Japan being the highest webpage occupied the top ranked country followed by China and South Korea.

Table 7
Ranking of Selected Countries in Asia based on WISER

SI No	Countries	TLD	Size (S)	Visibility (V)	Rich Files (R)	Google Scholar (Sc)	WISER Value	WISER
1	Japan	.jp	1	1	1	1	8	1
2	China	.cn	2	2	2	2	16	2
3	Taiwan	.tw	4	4	8	5	37	3
4	India	.in	6	5	5	3	40	4
5	South Korea	.kr	3	3	15	13	46	5
6	Turkey	.tr	8	6	7	6	53	6
7	Singapore	.sg	10	7	4	7	59	7
8	Israel	.il	7	9	6	4	60	8
9	Vietnam	.vn	5	8	9	10	61	9
10	Indonesia	.id	11	12	3	8	81	10
11	Malaysia	.my	9	10	10	14	82	11
12	Philippines	.ph	12	11	11	11	90	12
13	Iran	.ir	13	14	13	9	104	13
14	Saudi Arabia	.sa	14	15	14	15	117	14
15	UAE	.ae	17	13	20	16	122	15
16	Pakistan	.pk	16	18	12	12	128	16
17	Kazakhstan	.kz	15	16	17	18	129	17
18	Armenia	.am	18	17	16	17	137	18
19	Azerbaijan	.az	19	19	19	20	153	19
20	Uzbekistan	.uz	20	20	18	19	157	20

6. Internet Users and Population Statistics for Asia

There are so many parameters of assessing the web presence of a country. One way may be by judging the proportional Internet users and its growth. We can remark that if higher the percentage of Internet users, the higher will be the countries web presence. The Internet users and population statistics [14] is shown below:

The following table shows that there is a significant percentage (39.5) of Internet usage in the world. With respect to population percentage (56.6), Internet users are little less compared to rest of the world. The reason may be most of the countries in Asia are economically in developing nature. The Internet growth can be calculated with the using this formula, $\text{User Growth} = (Y_{2008} - Y_{2000}) / Y_{2000}$. In the above table, user growth is calculated as $\{885094104 - 246681745\} / 246681745 \times 100 = 258.8$

Table 8
Internet Users and Population Statistics for Asia

Areas	Population (2008 Est.)	% Population	Internet Users (2000)	Internet Users (2008)	% Usage of World	User Growth (2000-2008)
Asia	3776181949	56.60%	114304000	578538257	39.50%	406.14%
Rest of the World	2899938339	43.40%	246681745	885094104	60.50%	258.80%
World Total	6676120288	100.00%	360985745	1463632,61	100.00%	305.50%

Source: www.internetworldstats.com

7. Findings of the Study

There are 45 Asian Countries having their web presence in Web space but top 20 selected countries based on their webpages have been taken for this study. Japan is having highest number of webpages among Asian countries, followed by China and South Korea; India got sixth position based on number of webpages. South Korea is able to achieve remarkable increase (i.e. 367 times) in terms of web pages during 2008-2009. Turkmenistan also witnessed highest inlink counts 554.3 per thousand webpages but the country has not been shown in the table due its low webpages and also it has witnessed negative growth (54.15%) from Feb 2008 to Feb 2009. The credit of achieving highest overall WIF and revised WIF goes to Armenia, whose webpage is only 1,730. Therefore, volume of webpage is an important indicator for influencing WIF of any country or institutions. The growth of highest Internet users' growth is Uzbekistan. Taiwan attained highest number of academic webpage (68, 80,000) beating China (45, 20,000) and even Japan (53, 80,000). India becomes highest growth of Internet users during last one year i.e. April 2007 to April 2008. It has also been reflected that Japan is producing highest number of links to and from .com domain [Table 4].

8. Conclusion

It is a fact that nearly, one billion people around the world are Online. Seven Asia-Pacific countries are in the top 20 countries for number of Internet users among them three are China, Japan, and India in the top five. Internet Penetration in Asia is 17.4% whereas world average is 23.8% [15] on March 2009. Asia is having 41.2% [13] Internet users in the world. The latest internetworldstats.com statistics show that worldwide Internet penetration has increased to 16.0%, due to increased contribution from Asian countries. India has more than 39 million [16] Internet users i.e. 13% of the World's Web population. Japan is the world's third largest Internet market with an estimated 68 million subscribers. China being the second highest number [16] of Internet users having 11.8% after USA (19.7%) followed by India with 4.9% of world Internet Users. Therefore, there is a huge importance of web presence study in the Asian countries. Besides hyperlink analysis are also required to know the interconnection of one country to another with the power of search engines. The present study of webometric analysis of selected Asian countries is an attempt to bring out the importance of webometric research and tried to throw some lights on few aspects specifically hyperlink studies so as to reflect the present status of Asian countries and their relative position among themselves.

Further studies can be made on the language aspects of Asian countries under the purview of webometric study. From different studies [2], it has been identified several language families on the Asian continent: Austroasiatic, Austronesian, Dravidian, Indo-Iranian, Mongolian, Semitic, Sino-Tibetan, Thai-Kadai, Turkic and Tungus. Some of the language families are not firmly established. There are some isolated languages around the Asian continent, e.g Korean, Japanese. Japanese has the largest number of speakers with about 125 million and Korean follows with about 75 million. Therefore, it would be quite an interesting study to specifically focus on language aspects.

In the case of our study, it is revealed from above table that having only 1,730 web pages Armenia occupied the top position followed by China based on revised web impact factor. Besides, Azerbaijan got the 4th position due the low- webpage (i.e. 8670). It has also been reflected that Japan is producing highest number of links to and from .com domain

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Annex 1

Webometric Data collected from AltaVista, Feb 18-19, 2009 & Google March 20-21, 2009

Countries	TLD	Webpage (A)	Inlinks (B)	Rich Files [R]					Google Scholar (Sc)
				pdf	ps	doc	ppt	Total	
Japan	.jp	535000000	276000000	25100000	41600	845000	141000	26127600	13900000
China	.cn	236000000	253000000	21300000	15100	1300000	181000	22796100	13500000
South Korea	.kr	220000000	123000000	2620000	1100	54800	12500	2688400	1070000
Taiwan	.tw	124000000	58900000	12100000	6870	255000	42500	12404370	1910000
India	.in	124000000	32700000	16400000	12500	895000	116000	17423500	6290000
Turkey	.tr	112000000	18900000	13900000	6470	362000	37100	14305570	1750000
Vietnam	.vn	280000000	11400000	12000000	1340	288000	30800	12320140	1170000
Singapore	.sg	83600000	11800000	17300000	16700	252000	41600	17610300	1740000
Israel	.il	116000000	8600000	14600000	28000	562000	49000	15239000	3380000
Malaysia	.my	95000000	8390000	12000000	930	223000	29500	12253430	1020000
Indonesia	.id	55800000	5300000	20000000	1770	267000	36800	20305570	1290000
Philippines	.ph	40200000	5830000	11300000	735	178000	25400	11504135	1080000
Iran	.ir	30000000	2830000	8290000	1600	210000	82300	8583900	1190000
Saudi Arabia	.sa	11500000	2670000	3550000	597	73400	11600	3635597	391000
Pakistan	.pk	10400000	1390000	9570000	743	212000	22200	9804943	1070000
Kazakhstan	.kz	10700000	2240000	2320000	636	49000	7360	2376996	192000
UAE	.ae	9020000	2850000	1140000	307	41200	6940	1188447	198000
Armenia	.am	7720000	1720000	2560000	948	61000	6410	2628358	194000
Azerbaijan	.az	4440000	459000	1930000	216	39400	5110	1974726	122000
Uzbekistan	.uz	3960000	339000	2020000	351	35000	4610	2059961	133000