

Information on the Rankings Web, including the Webometrics Ranking of Universities

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General description of the ranking and its history

The **Cybermetrics Lab** is a research group belonging to the largest public scientific body in Spain, the National Research Council (Consejo Superior de Investigaciones Científicas, **CSIC**) that is amongst the top 20 most important research centers of the world.

The Lab starts to work on metrics for evaluation of science and technology about 20 years ago, moving from bibliometrics to webometrics in mid-nineties when Internet became an important tool for scholarly communication. In these two decades the Lab members have published about two hundred papers in peer reviewed journals, participating in about 100 international scientific conferences, attending and organizing academic events, being members or chairing committees of experts and developing international projects including several key ones funded by the European Commission.

The Lab have had a relevant role in the developing of the discipline known as cybermetrics or webometrics, including the edition of the electronic journal **Cybermetrics**, first published in 1997, devoted entirely to this scientific field.

About the first years of 2000 decade the Lab developed several collection tools for automatic data extraction from the Web and tested the reliability and usefulness of individual web indicators. The publication in 2003 of the so-called Shanghai Ranking inspired our group to adopt two relevant innovations of that initiative: To develop a composite indicator combining different web variables and to build an independent ranking of universities using that composite indicator. The first edition was published in **2004**, the second global ranking of the current generation.

But the main aim of the Ranking was not to rank the higher education institutions, but to promote the **Open Access initiatives**, so the methodological design of the main indicator was strongly influenced by this policy-related objective.

The Lab was ever interested in the analysis of developing countries, especially those in Latin-America, so one of the first objectives of the ranking was to increase the coverage beyond the Top 500th mark in order to describe the full academic systems of all the countries.

The development of the Ranking Web is part of a research agenda. Our group makes theoretical and empirical analysis of the use of metrics for evaluation purposes, including improving the design of indicators, testing the reliability of the sources and checking the overall quality of the system. That means that stability is not a key issue for the Ranking as both the sources used and the methodology applied evolve with the obtained results. This makes

senseless the inter-year comparison and it is the reason for making publicly available only the last updated edition.

Philosophy of the Ranking

In an open academic environment the web presence reflects the higher education institutions as a whole. Not only the organization, structure, history or values are included, but the Web is key for all the missions of the university, as it supports learning, communicates the research outputs, it is the platform for technological and knowledge transfer, helps in the internationalization of the institution and connects with the internal and external community.

From that point of view, such web presence is a good proxy for describing the performance and impact of the university missions in a holistic way, hampered only by bad practices or failed web policies. As almost all universities have their own web domain it is possible to apply webometrics tools for obtaining a true reliable representative picture of this institutions without relying in dozens of strongly correlated biased subjective indicators. As shown in Table 1, a single indicator like the volume of web contents is able to describe a large series of the activities linked to specific university missions in a very inclusive way.

Table 1. Non-exhaustive list of missions and activities as reflected in the University websites

MISSIONS		WEBCONTENTS
GOVERNANCE	Long-term Strategy	Policies, priorities, resources mentioned in the Web
	Internal Organization	Reflected in the web hierarchy & structure (subdomains/directories) CMS responsibilities and rules
	Quality Assurance & Transparency	Open public reporting
	Attraction of Talent	Web showcase: Info for future students & candidate faculty members
	End-user oriented policies	General info: Mission, Vision, History, Community, Facts & Statistics News, Highlights, Publications, Emergency info
EDUCATION	Schools & Academics	Departments & Disciplines: Degrees, People, Courses, Programs, Labs, Requirements, Calendars, Events Supporting material: Learning Guides; Multimedia
	Library	Repository of teaching objects Digital library
	Distance/Online Education	Interactive Resources: Learning platforms
	Social Media	Web 2.0 networks & tools
	RESEARCH	Basic & Applied Research
Library		Repository of academic papers/thesis & dissertations Other repositories
THIRD MISSION		Community Engagement
	Technology transfer	Networks, Consortia, Resources, Technological Parks, Spin-offs
	Knowledge transfer	Consulting services, foundations
	Internationalization	Strategies & business model, Global networking, other activities

As previously stated one of the objectives of the Ranking is to include the all institutions from every country, including the developing ones. As research is not only a university mission, the Lab developed in 2008 other related rankings including Research Centers, Hospitals, Business Schools (discontinued) and Repositories. The Table 2 shows a comparative summary of the coverage of the main global rankings, including when available information about other institutions (2014 data).

Table 2. Main global rankings: Coverage and criteria

Ranking	Editor	Sector	Universities	Others	Main Criteria
ARWU	Consulting	Private	500		Research excellence
THE	Magazine	Private	400		Bibliometrics/Survey
QS	Consulting	Private	800		Bibliometrics/Survey
URAP	University	Public	2,000		Bibliometrics
LEIDEN	University	Public	750		Bibliometrics
SCIMAGO	Research	Public	3500	15,000	Bibliometrics
NTU-HEEACT	University	Public	500		Bibliometrics
U-MULTIRANK	University	Public	800		Customisable
WEBOMETRICS	Research	Public	22,000	25,000	Biblio/Webometrics

Model and methodology

Webometrics theoretical and practical aspects are strongly rooted in those from bibliometrics, where major tool is citation analysis. Similarly, link analysis is a powerful tool for designing a composite indicator that can describe overall performance of the institution.

The model is built on a **ratio 1:1** between activity, the volume of information provided by the institution in its websites, and visibility or impact, a virtual referendum among third-party webmasters about the quality, interest or usefulness of the university web contents.

For descriptive purposes this ratio 1.1 is expressed as weighting percentages of **50%:50%** in the composite indicator building (Figure 1).

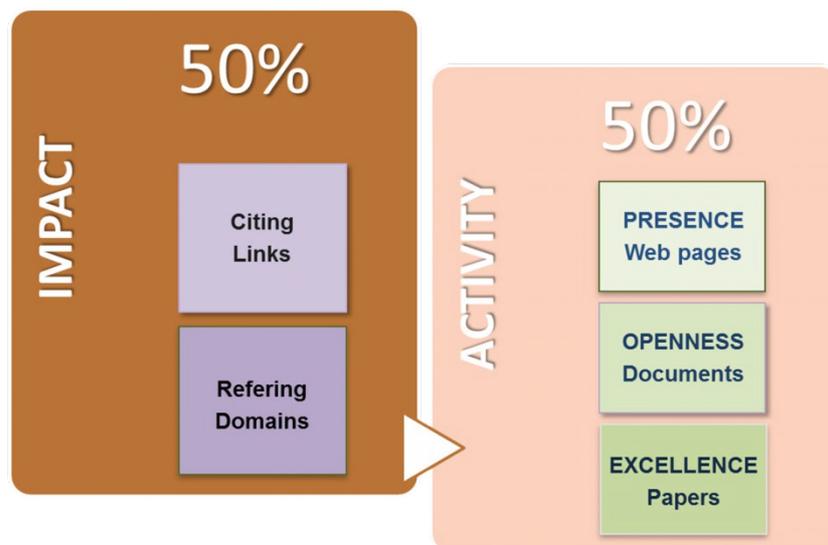


Figure 1. Composite Indicator Model of the Ranking Web

Regarding activity, counting webpages is insufficient for reflecting the diverse nature of the contents, as the different missions should not have the same relative importance. Clearly, the research mission is playing a central role in the definition of World-class university status, but an indicator is needed that includes not only research intensive institutions. This was solved using two different levels of research evaluation: One taking into account the amount of scientific output that was openly available (valid for about 90% of the institutions) and other recognizing only research excellence (with values larger than zero for about 25% of the population).

The current composition (July 2014) of the activity section (50%) consists of three indicators whose sources, calculation methods and weighting is described below:

Presence. The total number of webpages hosted in the main webdomain (including all the subdomains and directories) of the university as indexed by the largest commercial search engine ([Google](#)). It counts every webpage, but excludes the rich files (filetypes like pdf, doc, docx, ppt, pptx, ps or eps) for not overlapping with Openness indicator. It is not possible to have a strong presence without the contribution of everybody in the organization as the top contenders are already able to publish millions of webpages. Having additional domains (old or discontinued) or alternative central ones for foreign languages or marketing purposes penalizes in this indicator as we never combines data from them in the sense it is a bad practice as it is very confusing for external users. The weighting is 1/3 corrected to **15%**.

Openness. The global effort to set up institutional research repositories is explicitly recognized in this indicator that takes into account the number of files in **Google Scholar**, the largest academic search engine (over unique 160 million records). There are two components, the total number and the recent publications, those published between 2009 and 2013 in order to increase the deposit rate. The weighting is 1/3 corrected to **15%**.

Excellence. The academic papers published in high impact international journals are playing a very important role in the ranking of Universities. Using simply the total number of papers can be misleading, so we are restricting the indicator to only those excellent publications, i.e. the university scientific output being part of the **10% most cited papers** in their respective scientific fields. Although this is a measure of high quality output of research institutions, the data provider, the [Scimago group](#), supplied non-zero values for more than 5500 universities (period 2008-2012). The weighting is 1/3 corrected to **20%**.

The Impact variable (**50%**) is based on link visibility, considering that if a third party links to the main institutional or a specific webpage is recognizing the qualities of the organization or the contents provided. Link visibility (number of links) is a far more powerful indicator that popularity (number of visits) that apart being strongly correlated with size cannot be derived from an informed decision. Counting links coming from huge audiences allow a "virtual referendum", where the institutional prestige, the academic performance, the value of the information, and the usefulness of the services are satisfying the criteria of millions of web editors from all over the world.

Visibility. The link visibility data is collected from the two most important providers of this information: Majestic SEO and ahrefs. Both use their own crawlers, generating different databases that should be used jointly for filling coverage gaps or correcting mistakes. The procedure involves extracting both total number of external inlinks (also called backlinks) and the number of webdomains that are the origin of these links (referring domains) from each source. For avoiding strong interlinking from local sources (pseudo-external domains for/from

sports, clubs, blogs, city...) or gaming the system contracting link farms, the 10 top linking domains and their corresponding backlinks are excluded. The final indicator is obtained from the product of square root of the number of backlinks and the number of domains originating those backlinks (favoring link diversity). This is a light version of the Google PageRank algorithm. The maximum of the two sources for each university is finally chosen.

All the variables are lognormalized for avoiding problems linked to power-law distributions, common to other rankings (Figure 2).

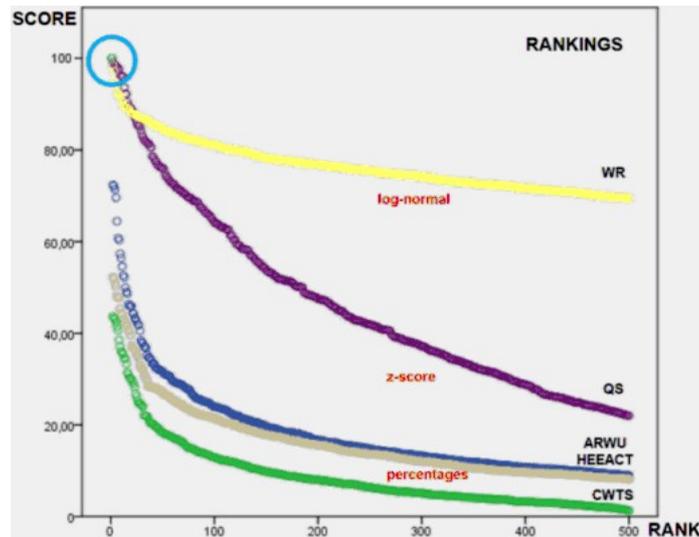


Figure 2. Power law distribution and different normalization systems

Other information.

The Ranking is published two times per year, with data starting to collect the first days of **January** and **July** and publication following at the end of both months. Only the current edition is publicly available, with rank information (lower values are better), not the raw numbers used in the calculations that are not openly shared.

The Ranking provides an overall overview of the whole university but no specific mission (except perhaps research) is linked to any of the indicators.

If the web performance of an institution is below the expected position according to their academic excellence, university authorities should reconsider their web policy, promoting substantial increases of the volume and quality of their electronic publications. Bad practices like using of several webdomains or maintaining the old domain after changing it, strongly penalizes the university rank.

The ranking information is useful for a wide range of audiences, although we strongly recommend checking non-academic info (fees, living expenses, campus facilities, safety, ..) to students searching for a university.

We internally have a black list of fake or diploma-mills institutions and the Ranking explicitly states those online-only universities. In the past editions about 10 universities from 4 different countries have been excluded due to manipulations of their websites.

Annex 1

Geographical distribution of the Top Universities by Region, BRICS countries, Eastern European countries and former USSR countries (Ranking Web, July 2014)

REGION / COUNTRY	DOMAINS	UNIVERSITIES IN THE TOP					TOTAL
		100	500	1001	5002	10003	
NORTH AMERICA		64	167	276	1210	2678	3622
EUROPE		21	207	401	1481	2859	5848
<i>Russian Federation</i>	<i>ru</i>		3	9	184	464	
Estonia	ee		1	2	5	12	
Lithuania	lt			2	11	23	
Ukraine	ua			1	43	133	
Belarus	by			1	14	37	
Latvia	lv			1	6	19	
Georgia	ge				2	6	
Moldova	md				2	5	
Armenia	am				1	6	
Azerbaijan	az					4	
Czech Republic	cz	1	4	10	22	48	
Poland	pl		4	12	77	188	
Hungary	hu		2	6	19	40	
Slovenia	si		1	1	4	8	
Romania	ro			2	30	60	
Slovakia	sk			2	17	24	
Serbia	rs			2	6	11	
Croatia	hr			1	5	14	
Bulgaria	bg			1	14	32	
Bosnia and Herzegovina	ba				5	11	
Macedonia FYR	mk				3	4	
Montenegro	me				1	1	
ASIA		10	85	227	1644	3111	6864
<i>China PRC</i>	<i>cn,hk,mo</i>	5	43	106	725	1106	
<i>India</i>	<i>in</i>			4	108	315	
Kazakhstan	kz				10	38	
Kyrgyzstan	kg				1	4	
Uzbekistan	uz					6	
Tajikistan	tj						
Turkmenistan	tm						
OCEANIA		3	19	36	50	91	212
LATIN AMERICA		2	17	46	459	932	3750
<i>Brazil</i>	<i>br</i>	1	11	25	184	358	
AFRICA			3	8	61	115	695
<i>South Africa</i>	<i>za</i>		3	7	18	24	
ARAB WORLD			2	7	97	216	981
OTHER						1	1
WORLD							21973

Annex 2

Ranking Web (July 2014) of the Top 50 Russian universities & Project 5to100 Universities

RUSSIA	WORLD	ENGLISH NAME / RUSSIAN NAME	PRES	VISIB	OPEN	EXC
1	122	Lomonosov Moscow State University / Московский государственный университет М В Ломоносова	139	116	133	341
2	486	Novosibirsk State University / Новосибирский государственный университет	833	226	973	1211
3	492	St Petersburg State University / Санкт-Петербургский государственный университет	465	636	351	876
4	641	National Nuclear Research University (Moscow State Engineering Physics Institute) / Национальный исследовательский ядерный университет МИФИ	1370	842	405	1015
5	781	National Research University Higher School of Economics / Национальный исследовательский университет Высшая школа экономики	189	564	8	3711
6	810	Southern Federal University (Rostov State University) / Южный федеральный университет	1280	560	322	2365
7	836	Moscow Institute of Physics and Technology / Московский физико-технический институт государственный университет	56	1057	1367	1689
8	985	St Petersburg State Institute of Fine Mechanics and Optics / Санкт-Петербургский национальный исследовательский университет информационных технологий, механики	1197	1147	265	2384
8	985	Saratov State University / Саратовский государственный университет	1835	1250	434	1857
10	1030	Tomsk State University / Томский государственный университет	564	1427	587	2214
11	1069	Ural Federal University / Уральский федеральный университет	1452	1881	410	1636
12	1092	St Petersburg State Polytechnic University / Санкт-Петербургский государственный Политехнический университет	1808	1497	608	1829
13	1099	Siberian Federal University / Сибирский федеральный университет	235	1972	220	2501
14	1303	Nizhny Novgorod State University / Нижегородский государственный университет Н И Лобачевского	394	1954	726	2638
15	1314	Tomsk Polytechnic University / Национальный исследовательский Томский Политехнический Университет	1038	2209	186	2638
16	1394	Bauman Moscow State Technical University / Московский государственный технический университет Н Э Баумана	1273	903	1256	3515
17	1484	Kazan (Volga Region) Federal University / Казанский (приволжский) Федеральный Университет	666	4084	324	2068
18	1615	Voronezh State University / Воронежского государственного университета	2017	2872	212	2900
19	1658	Belgorod State University / Белгородский государственный национальный исследовательский университет	1705	2082	1258	2900
20	1689	Novosibirsk State Technical University / Новосибирский государственный технический университет	536	1455	3064	3368
21	1692	(1) Peoples' Friendship University of Russia / Российский университет дружбы народов	2087	1842	2058	2742
22	1720	Chelyabinsk State University / Челябинский государственный университет	3752	1751	287	3711
23	1739	Udmurt State University / Удмуртский государственный университет	2655	1824	469	3711
24	1755	Kemerovo State University of Culture and the Arts / Кемеровского государственного университета культуры и искусств	2503	382	1642	5442
25	1855	Irkutsk State University / Иркутский государственный университет	352	3823	1588	2706
26	1879	Saratov State Technical University / Саратовский государственный технический университет	311	2922	1212	3611
27	1953	Moscow State Institute of International Relations / Московский государственный институт международных отношений (университет)	1611	974	933	5442
28	2081	Gubkin Russian State University of Oil and Gas / Российский государственный университет нефти и газа ИМ Губкина	2447	2476	1978	3144
29	2211	Southern Ural State University / Южно-Уральский государственный университет	1605	2746	875	4175
30	2227	Kemerovo State University / Кемеровский государственный университет	528	2492	1099	4831
31	2238	St Petersburg State Electrotechnical University / Санкт-Петербургский государственный электротехнический университет	247	4872	1314	3368
32	2283	Northern (Arctic) Federal University (Arkhangelsk State Technical University) / Северный (Арктический) федеральный университет М В Ломоносова	502	1786	1590	5442
33	2285	Perm State University / Пермский государственный национальный исследовательский университет	2598	3178	446	4175
34	2343	Tambov State Technical University / Тамбовский государственный технический университет	1612	3591	658	4175
35	2362	Ural State Economical University / Уральского Государственного Экономического университета	320	3777	1125	4442
36	2385	National University of Science and Technology MISIS (Moscow Institute of Steel and Alloys) / Национальный исследовательский технологический университет	1057	4346	4020	2445
37	2403	Karelian State Pedagogical University / Карельская Государственная Педагогическая Академия	767	1204	3521	5442
38	2439	Tomsk State University of Control Systems and Radioelectronics / Томский государственный университет систем управления и радиоэлектроники	1949	2998	1067	4442
39	2463	Ulyanovsk State Technical University / Ульяновский государственный технический университет	3431	2532	659	4831
40	2482	Financial University under the Government of the Russian Federation / Финансовый Университет при Правительстве РФ	3283	1779	927	5442
41	2497	Altai State University / Алтайский государственный университет	1821	2722	422	5442
42	2518	Samara State Aerospace University / Самарский государственный аэрокосмический университет С П Королёва	1301	3704	1664	3996
43	2522	Siberian State Automobile and Road Academy / Сибирская государственная автомобильно-дорожная академия	264	2853	1358	5442
44	2526	Moscow Aviation Institute University of Aerospace Technology / Московский авиационный институт (национальный исследовательский университет)	3519	2846	929	4442
45	2535	Moscow State Institute of Radio Engineering Electronics and Automation / Московский государственный технический университет радиотехники, электроники и автомат	3883	3099	2360	3439
46	2565	Vladivostok State University of Economics / Владивостокский государственный университет экономики и сервиса	2627	2015	1009	5442
47	2580	Ufa State Aviation Technical University / Уфимский государственный авиационный технический университет	6185	5244	1051	2549
48	2602	Byisk State Pedagogical University VM Shukshin / Алтайская государственная академия образования В М Шукшина	1587	1918	1884	5442
49	2611	Moscow State University of Civil Engineering / Московский Государственный Строительный Университет	213	3498	2963	4442
50	2704	Moscow Power Engineering Institute / Национальный исследовательский университет МЭИ	1493	4190	3610	3213
67	3045	Far Eastern Federal University / Дальневосточный федеральный университет	2090	3313	1482	5442

Pres=Presence Rank

Visib=Visibility Rank

Open=Openness Rank

Excel=Excellence Rank

Annex 3

Questions?

1. Do you think the size of the institution is a key factor?
2. What do understand by size?
3. Do you know what criteria are relevant for the World class university status?
4. Has your university an Open Access policy, an institutional repository and a mandate for depositing?
5. What are the best internationalization strategies?
6. Do you know the ratio of your faculty members that publish regularly in international journals? And the ratio of papers in first quartile?
7. Who is in charge of your websites? How any people are involved in web publication?
8. Are you considering community engagement? Socioeconomic issues, technology transfer, local culture, public health, environmental topics, tourism, ...

Annex 4

External info

Ranking Web of Universities	http://www.webometrics.info/
Ranking Web of Research Centers	http://research.webometrics.info/
Ranking Web of Hospitals	http://hospitals.webometrics.info/
Ranking Web of Business Schools (July 2013)	http://business-schools.webometrics.info/
Ranking Web of Repositories	http://repositories.webometrics.info/
Papers by Cybermetrics Lab Head	http://scholar.google.com/citations?user=SaCSbeoAAAAJ