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Hyperlink Analyses of High School Library Website in China

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Abstract: Library website quality of high school can be evaluated by means of hyperlink analysis; the method is to search high school library website by google searching website; use advance search to get measure index and make analysis and comes out with the present taxis of website quality according to different taxis index and synthesizing index, along with preference taxis of every index.

Key words: High school library, website hyperlink analyses, quality evaluation

INTRODUCTION

Along with internet prevalence, more and more readers are accustomed to gain information via it. As regional literature information center, high school library is the most basic and important information source. High school library is qualified to present all kinds of web information services. Therefore, it has become an issue for many library website constructors to ponder how to construct high school library website, how to evaluate construction quality and how to present readers with satisfying web information service. This study is to analyze the hyperlink of high school library website in China.

RESEARCH SCHEME DESIGN

Research object selection: For convenience, we select libraries of famous high schools, excluding those in Taiwan, Hong Kong and Macao.

Research index selection: Webpage quantity: It generally refers to the searched quantity of web pages searched via a search engine.

Total hyperlink quantity: It generally refers to the total webpages connected with a certain website searched via a search engine

Inner hyperlink quantity: It generally refers to the total web pages, via a search engine, related with a certain website in the range of one website.

Outer hyperlink quantity: It generally refers to the total web pages, via a search engine, related with a certain website out of the range of one website.

Hyperlink measure deviance: theoretically, there exists an equation: Overall hyperlink quantity equals inner hyperlink quantity plus outer hyperlink quantity. But in fact, searching has deviance. Hyperlink measure deviance equals (overall hyperlink quantity minus inner hyperlink

quantity plus outer hyperlink quantity) divided by overall hyperlink quantity. But it has not evaluating and analyzing significance in this study, so it is not used.

Web-influence factor: Web-influence factor equals overall hyperlink quantity divided by webpage quantity; Outer web-influence factor equals outer hyperlink quantity divided by webpage quantity (Yangtao, 2003; Junping and Lu, 2003).

Research tools selection: Commercial research tools can be selected from some research engines with advanced searching function such as Google, alltheweb, etc, among which Google is more powerful and convenient. Besides the foregoing web information metrology index, Google can provide other concrete-valued data, such as similar webpage, which is used to search webpage relating to some webpage. The number of similar webpage can reflect character degree of website. Hyperlink is used to search webpage connecting with certain webpage (in this article it refers to webpage connecting with the home webpage of some website), the number of hyperlink can reflect other websites' the recognition toward it.

Data processing tools: according to need and convenience, we choose EXCEL.

DATA SOURCE AND SEARCHING METHODS

Data searching methods: Firstly, we search high school website via Google. After filling website address in

Table 1: Searching formula list

Searching item	Searching formula
Hyperlink number	link: www.lib.tsinghua.edu.cn
Similar webpage number	related www.lib.tsinghua.edu.cn
Inner hyperlink number	www.lib.tsinghua.edu.cn site: www.lib.tsinghua.edu.cn
Outer hyperlink number	www.lib.tsinghua.edu.cn-site: www.lib.tsinghua.edu.cn
Webpage number	site:www.lib.tsinghua.edu.cn
Total hyperlink number	www.lib.tsinghua.edu.cn

Table 2: Statistics of high school website hyperlink library

Library	Website	Total hyperlink number	Inner hyperlink number	Outer hyperlink number	Web page number	Web influence factor	Outer web influence factor	Similar web number	Hyperlink number
Tsinghua University	www.lib.tsinghua.edu.cn	5930	4260	1680	4260	1.392	0.394	28	867
Dalian University of technology	www.lib.dlut.edu.cn	1940	1640	121	1680	1.155	0.072	31	66
Beihang University	lib.buaa.edu.cn	3070	3250	104	3250	0.945	0.043	31	38
Beijing Institute of Technology	lib.bit.edu.cn	333	272	50	273	1.220	0.183	30	34
Hebei University	lib.hbu.edu.cn	9	7	2	7	0.992	0.022	00	00
Beijing Normal University	www.lib.bnu.edu.cn	43	19	24	19	2.263	1.263	31	38
Tianjin University	www.lib.tju.edu.cn	4550	3320	164	3370	1.350	0.049	31	29
Nankai University	www.lib.nankai.edu.cn	706	671	23	680	1.038	0.034	31	22
Peking University	www.lib.pku.edu.cn	9030	8790	325	8880	1.017	0.037	31	1350
Jilin University	lib.jlu.edu.cn	1700	1690	31	1740	1.017	0.019	29	14
Nanjing University	lib.nju.edu.cn	1080	889	105	907	1.191	0.116	31	180
Hebei Normal University	library.hebtu.edu.cn	31	26	5	26	1.192	0.192	00	7
Xidian University	www.lib.xidian.edu.cn	71	31	40	31	2.290	1.290	30	43
National University of Defense Technology	library.nudt.edu.cn	23	6	17	6	3.833	2.833	30	20
Tongji University	www.lib.tongji.edu.cn	1540	859	54	865	1.780	0.062	31	19
Shanghai Jiao Tong University	www.lib.sjtu.edu.cn	163	125	35	127	1.284	0.276	30	43
Sun Yat-Sen University	library.sysu.edu.cn	865	831	14	838	1.032	0.017	31	13
Fudan University	www.library.fudan.edu.cn	6490	8460	90	8690	0.747	0.010	29	52
Xi'an Jiaotong University	www.lib.xjtu.edu.cn	901	648	198	655	1.376	0.302	31	94
Xiamen University	library.xmu.edu.cn	175	113	24	113	1.549	0.212	30	90
Beijing Jiaotong University	lib.bjtu.edu.cn	327	322	5	335	0.976	0.015	0	13
Beijing University of Posts and Telecommunications	www.lib.bupt.edu.cn	400	347	53	347	1.153	0.153	31	48
Daqing Petroleum College	lib.dqpi.edu.cn	10	15	10	15			1	1
Hunan University	lib.hnu.cn	117	113	3	114	1.026	0.026	0	20
Northeast Normal University	www.library.nenu.edu.cn	566	481	54	485	1.167	0.111	31	51
South China University of Technology	www.lib.scnt.edu.cn	14	11	3	11	1.273	0.273	0	15

2006.3.6(19:00-21:00) data stastic of the webpage

advanced searching frame, press searching button and acquire the relevant data. Otherwise, we can search by searching formula in Table 1.

Website hyperlink data: Data acquired by the above method are listed in Table 2.

DATA ANALYSIS

Statement on website hyperlink data: In the above statistical table, total hyperlink number is webpage number containing some website URL searched by Google. In fact these web pages have connections with the website, which reflect the number of website hyperlink. Inner hyperlink number is webpage number from the website among all websites searched by Google. Including URL. It reflects the completeness of the inner structure of the website; outer hyperlink number is webpage number out side of the website among all websites searched by Google including URL. It better reflects the quality of the website; webpage number is webpage number of a certain website searched by Google. It reflects the size of the website in some way; web influence factor reflects the overall average level of the webpage is connected; outer web influence factor reflects the overall average level of the webpage connected by the

outer, which is regarded as reflecting the level of website better; similar hyperlink number is the webpage which is similar and relevant to some home webpage searched by Google. It reflects the individuality of the home webpage;

Hyperlink number is webpage number connected with certain website searched by Google. These can be sorted by different index, just as the following Table 3.

It can be seen from Table 3 that the results are quite different with different indexes and it is quite difficult to tell which index is better. So a synthetical index is needed for taxis. The following is relating taxis.

Hyperlink relevance taxis: For a website, the bigger the above indexes, the better they are, which is opposite to similar webpage. Therefore, a reference row can be inserted in Table 2, where the value corresponding to the column of similar webpage is the minimum among the column which is located in, while other values is the maximum. Then by the point relevance formula:

$$\begin{aligned}
 V(X_0(k), X_1(k)) &= \\
 &= \frac{\min_k |X_0(k) - X_1(k)| + \zeta \max_k |X_0(k) - X_1(k)|}{|\min_k |X_0(k) - X_1(k)| + \zeta \max_k |X_0(k) - X_1(k)|} \\
 &= \frac{4513.5}{|\min_k |X_0(k) - X_1(k)| + 4513.5}
 \end{aligned}$$

Table 3: The result taxis of different index

Overall hyperlink number	Inner hyperlink number	Outer hyperlink number	Web page number	Web influence factor	Outer web influence factor	Similar web number	Hyperlink number
Peking University Library	Peking University Library	Tsinghua University Library	Peking University Library	National University of Defense Technology Library	National University of Defense Technology Library	South China University of Technology Library	Peking University Library
Fudan University Library	Fudan University Library	Peking University Library	Fudan University Library	Xidian University Library	Xidian University Library	Hebei Normal University Library	Tsinghua University Library
Tsinghua University Library	Tsinghua University Library	Xi'an Jiaotong University Library	Tsinghua University Library	Beijing Normal University	Beijing Normal University	Hunan University Library	Nanjing University Library
Tianjin University Library	Tianjin University Library	Tianjin University Library	Tianjin University Library	Tongji University Library	Tsinghua University Library	Hebei University Library	Xi'an Jiaotong University Library
Beihang University Library	Beihang University Library	Dalian University of Technology Library	Beihang University Library	Xiamen University Library	Xi'an Jiaotong University Library	Beijing Jiaotong University Library	Xiamen University Library
Dalian University of Technology Library	Jilin University Library	Nanjing University Library	Jilin University Library	Tsinghua University Library	Shanghai Jiao Tong University Library	Daqing Petroleum College Library	Dalian University of Technology Library
Jilin University Library	Dalian University of Technology Library	Beihang University Library	Dalian University of Technology Library	Xi'an Jiaotong University Library	South China University of Technology Library	Tsinghua University Library	Fudan University Library
Tongji University Library	Nanjing University Library	Fudan University Library	Nanjing University Library	Tianjin University Library	Xiamen University Library	Jilin University Library	Northeast Normal University Library
Nanjing University Library	Tongji University Library	Tongji University Library	Tongji University Library	Shanghai Jiao Tong University Library	Hebei Normal University Library	Fudan University Library	Beijing University of Posts and Telecommunications Library
Xi'an Jiaotong University Library	Sun Yat-Sen University Library	Northeast Normal University Library	Sun Yat-Sen University Library	South China University of Technology Library	Beijing Institute of Technology Library	National University of Defense Technology Library	Xidian University Library
Sun Yat-Sen University Library	Nankai University Library	Beijing University of Posts and Telecommunications Library	Nankai University Library	Beijing Institute of Technology Library	Beijing University of Posts and Telecommunications Library	Xidian University Library	Shanghai Jiao Tong University Library
Nankai University Library	Xi'an Jiaotong University Library	Beijing Institute of Technology Library	Xi'an Jiaotong University Library	Hebei Normal University Library	Nanjing University Library	Shanghai Jiao Tong University Library	Beijing Normal University
Northeast Normal University Library	Northeast Normal University Library	Xidian University Library	Northeast Normal University Library	Nanjing University Library	Northeast Normal University Library	Xiamen University Library	Beihang University Library
Beijing University of Posts and Telecommunications Library	Beijing University of Posts and Telecommunications Library	Shanghai Jiao Tong University Library	Beijing University of Posts and Telecommunications Library	Northeast Normal University Library	Dalian University of technology Library	Beijing Institute of technology Library	Beijing Institute of Technology Library
Beijing Institute of Technology Library	Beijing Jiaotong University Library	Jilin University Library	Beijing Jiaotong University Library	Dalian University of technology Library	Tongji University Library	Beijing Normal University	Tianjin University Library
Beijing Jiaotong University Library	Beijing Institute of Technology Library	Xiamen University Library	Beijing Institute of Technology Library	Beijing University of Posts and Telecommunications Library	Tianjin University Library	Xi'an Jiaotong University Library	Nankai University Library
Xiamen University Library	Shanghai Jiao Tong University Library	Beijing Normal University	Shanghai Jiao Tong University Library	Nankai University Library	Beihang University Library	Beijing University of Posts and Telecommunications Library	Hunan University Library
Shanghai Jiao Tong University Library	Xiamen University Library	Nankai University Library	Hunan University Library	Sun Yat-Sen University Library	Peking University Library	Nanjing University Library	National University of Defense Technology Library
Hunan University Library	Hunan University Library	National University of Defense Technology Library	Xiamen University Library	Hunan University Library	Nankai University Library	Northeast Normal University Library	Tongji University Library
Xidian University Library	Xidian University Library	Sun Yat-Sen University Library	Xidian University Library	Peking University Library	Hunan University Library	Dalian University of technology Library	South China University of Technology Library
Beijing Normal University	Hebei Normal University Library	Beijing Jiaotong University Library	Hebei Normal University Library	Jilin University Library	Hebei University Library	Tongji University Library	Jilin University Library
Hebei Normal University Library	Beijing Normal University Library	Hebei Normal University Library	Beijing Normal University Library	Hebei University Library	Jilin University Library	Tianjin University Library	Beijing Jiaotong University Library
National University of Defense Technology Library	South China University of Technology Library	Hunan University Library	South China University of Technology Library	Beijing Jiaotong University Library	Sun Yat-Sen University Library	Beihang University Library	Sun Yat-Sen University Library
South China University of Technology Library	Hebei University Library	South China University of Technology Library	Hebei University Library	Hebei University Library	Beihang University Library	Beijing Jiaotong University Library	Peking University Library
University of Technology Library	National University of Defense Technology Library	Daqing Petroleum College Library	National University of Defense Technology Library	Beihang University Library	Beijing Jiaotong University Library	Peking University Library	Hebei Normal University Library
Hebei University Library	National University of Defense Technology Library	Daqing Petroleum College Library	National University of Defense Technology Library	Beihang University Library	Beijing Jiaotong University Library	Peking University Library	Hebei Normal University Library
Daqing Petroleum College Library	Daqing Petroleum College Library	Hebei University Library	Daqing Petroleum College Library	Daqing Petroleum College Library	Daqing Petroleum College Library	Sun Yat-Sen University Library	

Table 4: Hyperlink relating taxis of the web

Taxis	Library	Outer web influence factor	Overall web influence factor	Overall hyperlink number	Inner hyperlink number	Outer hyperlink number	web number	Similar web number	hyperlink number	Hyperlink relating
0	reference	2.833	3.883	9030	8790	1680	8880	0	1350	1.00
1	Peking University Library	0.037	1.017	9030	8790	325	8880	31	1350	0.97
2	Fudan University Library	0.010	0.747	6490	8460	90	8690	29	52	0.8801
3	Tsinghua University Library	0.394	1.392	5930	4260	1680	4260	28	867	0.8108
4	Tianjin University Library	0.049	1.350	4550	3320	164	3370	31	29	0.7398
5	Beihang University Library	0.043	0.945	3070	3250	104	3250	31	38	0.729
6	Dalian University of technology Library	0.072	1.155	1940	1640	121	1680	31	66	0.7093
7	Jilin University Library	0.019	1.017	1770	1690	31	1740	29	14	0.7069
8	Nanjing University Library	0.116	1.191	1080	889	105	907	31	180	0.7018
9	Tongji University Library	0.062	1.780	1540	859	54	865	31	19	0.6996
10	Xi'an Jiaotong University Library	0.302	1.376	901	648	198	655	31	94	0.6993
11	Sun Yat-Sen University Library	0.017	1.032	865	831	14	838	31	13	0.6964
12	Nankai University Library	0.034	1.038	706	671	23	680	31	22	0.695
13	Northeast Normal University Library	0.111	1.167	566	481	54	485	31	51	0.6941
14	Beijing University of Posts and Telecommunications Library	0.153	1.153	400	347	53	347	31	48	0.6924
15	Beijing Jiaotong University Library	0.015	0.976	327	322	5	335	0	13	0.6919
16	Beijing Institute of Technology Library	0.183	1.22	333	272	50	273	30	34	0.6915
17	Xiamen University Library	0.212	1.549	175	113	24	113	30	90	0.6906
18	Shanghai Jiao Tong University Library	0.276	1.284	163	125	35	127	30	43	0.69
19	Hunan University Library	0.026	1.026	117	113	3	114	0	20	0.6896
20	Xidian University Library	1.290	2.290	71	31	40	31	30	43	0.6888
21	Beijing Normal University Library	1.263	2.263	43	19	24	19	31	38	0.6888
22	South China University of Technology Library	0.273	1.273	14	11	3	11	0	15	0.6888
23	Hebei Normal University Library	0.192	1.192	31	26	5	26	0	7	0.6888
24	Hebei University Library	0.022	0.992	9	7	2	7	0	0	0.6886
25	National University of Defense Technology Library	2.833	3.833	23	6	17	6	30	20	0.6883
26	Daqing Petroleum College Library			3	0	3	0	0	0	0.5847

Table 5: Relating taxis of every index

Index	Relevancy	Outer web influence factor	Overall web influence factor	Similar web page number	Hyperlink number	Outer Hyperlink number	Inner hyperlink number	Webpage number	Overall Hyperlink
Index relevancy	1	0.99987	0.99984	0.99515	0.97798	0.9545	0.81491	0.81491	0.8052

Letting ≤ 0.5 and the above formula is

$$V_{0i} = V(X_0, X_1) = \frac{1}{n} \sum_{i=1}^n V(X_0(k), X_1(k))$$

By computing, the relevancy values are filled in the above table and sorted by relevance. The result is Table 4.

Just because of the integration of advantages and features, relevancy taxis is more objective and reliable.

For the data in Table 4, a reference column can be listed by relevancy data and also we can take advantage of relevance formula to compute relevancy which connected with other index data column (which is named index relevancy) in this way, which index is better can be show and sorted.

In Table 5, index relevancy shows the advantage and disadvantage of other web information counting index. It

shows the feasibility of evaluating websites by using outer web influence factor etc and the index reliability shows the quality of sorting different index. The results should have significance for the research of web information computation.

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