

Luyt, B., Goh, D. H. and Lee, C.S. (2009). Search locally: A comparison of Yehey! and Google. *Online Information Review*, 33(3), 499-510.

(OIR 2008-45) : OIR 33, 3.

Searching locally: a comparison of Yehey! and Google

Purpose: To evaluate the Filipino search engine, Yehey! against what has become the industry standard, Google.

Design/method: Fourteen queries were submitted to Yehey! and Google. The top ten sites returned were examined for dates created and modified, domain name, presence of dead or advertising links, overlapping links, and the quality of the site as indicated by statements of responsibility and purpose, as well as credentials.

Findings: Despite its promise of providing access to Filipino cyberspace, Yehey! falls short on most of the measures used to evaluate the two search engines.

Originality/value: To date little research has been conducted on local Asian search engines, despite the growth of Internet use in the region.

Keywords: Yehey!, Google, Philippines, Asia, search engines, evaluation, information retrieval.

Research paper.

1. Introduction

Search engines are arguably one of the most popular means of retrieving information from the Web, with Google currently being the leader in terms of market share. However, the explosive growth of information on the Web has resulted in information overload in search results listings, as queries may yield thousands of hits, with many of them possibly irrelevant. This problem may be addressed by specialized search engines that aim to cater to the unique information needs among diverse groups of users. Also known as vertical search engines (Chau & Chen, 2003), these focus on niche areas such as specific domains (e.g. health care, finance, shopping, etc.) or businesses within these domains.

In particular, Internet usage demographics have evolved to include a more international audience (Bar-Ilan & Gutman, 2005). For example, reports have suggested that approximately 39% of the population of Internet users come from Asia compared to 26% for Europe and 18% for North America (Internet World Statistics, 2008). This shift away from a US-centric Internet suggests a need to provide search services that cater to

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users in specific regions or countries for two reasons: (1) general or broad-based search engines such as Google may not comprehensively index Web sites of a particular country (Lawrence & Giles, 1999; Thelwall, 2002); and (2) even if comprehensive indexing were feasible, users may have to sift through many pages of irrelevant search results to obtain information relevant to the user's location of interest. For example, a search for "PIE" yields entries pertaining to mainly to recipes in Google when entries relating to the "Pan Island Expressway", a common acronym in Singapore may be more relevant for a driver wanting to find out about the exits along the expressway.

Recognizing this need, major search engines have launched their versions of what are known as "local search engines" – those that cater to a country or even region within a country (Padilla, 2007). Google's Search by Location service (<http://maps.google.com/maps>), which builds upon the Google Maps platform, users may enter queries restricted to a particular geographic area of interest (e.g. "restaurants near zoo"). Results are presented both as a list with addresses, and visually on a map. In addition, Google's AdWords targeted advertisement service supports country, region and city level targeting of advertisements. Likewise, Yahoo! provides a local search service (Yahoo! Local - <http://local.yahoo.com/>) that essentially functions as a business directory with the added functionalities of user ratings and reviews being supported. Searches are however currently restricted to cities and states in the US. Similarly, AOL Local allows users to search for businesses and other organizations. Here, users enter both a query and address information (city, state, zip code), and search results are presented as a list and on a map.

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Two common themes may be drawn from the local search engines discussed. First, the content offered by these local search engines are mainly focused on businesses (Plosker, 2004), which is understandable given that these search engines are for-profit organizations and part of their revenue stream comes from local advertisers. This means however, that users with other types of information needs may not be able to obtain relevant information via these search engines. Second, the major search engine players (e.g. Google and Yahoo!) offer US-centric local content. This observation is supported by a study of three major search engines which found that US sites were much better covered than sites in other countries (Vaughn & Thelwall, 2004). This bias in coverage is again understandable because the major search engines are based in the US, and the country is a large market, but this excludes a large percentage of non-US Web users who require non-US local content.

Given this gap, non-US local search engines have been established around the globe in an attempt to address the information needs of users who require information within a specific country. Also known as country-specific search engines, they support business-oriented search services similar to their US-based counterparts but also provide country-specific content similar to general search engines. Presumably, a user seeking for content in the latter category would have a better chance of obtaining relevant information using a country-specific search engine than a general one because of the more focused and comprehensive search indexes it maintains. A counter-argument however, is that a country-specific search engine may not have the same resources or expertise as an established major search engine (e.g. Google), and consequently may not be able to provide the same level of service in terms of breadth, depth and quality of

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content, speed of access, and service availability. For example, Smith (2003) compared three local New Zealand search engines against four major general search engines and three metasearch engines on New Zealand related topics, and found that local search engines do not offer a significant advantage over the general search engines. This suggests that users are no better off relying on a country-specific search engine than a general search engine such as Google.

The present study attempts to add to the body of knowledge in country-specific search engine effectiveness in meeting the information needs of users. To the best of our knowledge, there has been no work done for search engines in Asia, which contains a large and growing population of Internet users. Specifically, we investigate if a country-specific search engine produces better search results for queries requiring content focused on a particular country. One general search engine (Google) and a country-specific search engine (Yehey! from the Philippines) were used in our study. A range of queries from different domains were submitted to each of these services and the first 10 documents returned were retrieved and examined their relevance to the respective queries. These results then formed the basis for evaluating the effectiveness of the search engines.

2. Related Work

There have been several studies evaluating various aspects of search engine performance. For example, Leighton and Srivastava (1999) compared the performance of five search engines (AltaVista, Excite, Hotbot, Infoseek and Lycos) using actual questions asked by undergraduate students at a university library reference desk. The authors found varying levels of performance among search engines, although AltaVista, Excite and Infoseek generally produced better precision values than the other search engines. Next, Goh and

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Ang (2002) conducted a study comparing the retrieval effectiveness of general search engines and pay-for-performance search engines using Google and Overture. The test suite focused on the academic domain and consisted of 31 queries extracted from past examination questions administered to students from a Master's program in Information Studies. The study revealed that the mean precision for Google was significantly larger than Overture, and also indicated that Google outperformed Overture in the ranking of relevant documents, with more relevant documents in Google being placed higher in the search results listings than for Overture.

Apart from retrieval performance, studies have also been conducted on content coverage. A study by Thelwall (2000) on search engine coverage of 42 countries with five search engines (Yahoo!, HotBot, AltaVista, MSN, and InfoSeek) showed that large differences were evident among search engines. For example, Yahoo! only covered 17% of Japanese sites in their sample, but AltaVista performed much better at 74%. Another study by Vaughn and Thelwall (2004) investigated if three major search engines (Google, AltaVista and AllTheWeb) exhibited content coverage bias towards the US or other countries. Results suggest that US sites were much better covered than sites from the other countries used in the study: China, Taiwan and Singapore.

Related to coverage is the issue of language support since there are a growing number of users whose native language is not English, the predominant language used in the Internet. Bar-Illan and Gutman (2005) explored the capabilities of three search engines (Google, AltaVista, FAST) to handle four languages: Russian, French, Hungarian and Hebrew. Findings indicate that the search engines often do not handle the special characteristics of non-English languages well. This means that non-English speaking

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users of these search engines may miss out on important content if they do not realize the inherent limitations of these search services when searching for content in languages other than English.

Finally, focusing on New Zealand, Smith (2003) compared three of the country's local search engines (SearchNZ, SearchNow and NZExplorer) against four major search engines (Google, AllTheWeb, HotBot and AltaVista) and three metasearch engines (Excite, Vivisimo and SurfWax). A set of 10 queries relating to New Zealand topics were used in this study. Results showed that the local search engine did not offer a significant advantage over the major search engines. In fact, no search engine in the study achieved more than 42% recall, which was found by taking the total number of relevant pages obtained from the search engine divided by the total number of relevant pages.

3. Yehey!

Yehey! traces its roots back to a beta version launched by Festiva Corporation on February 17, 1997. Initially the company did not offer a search service, but a directory of 1600 sites online. From the beginning, the company was aware of the particular characteristics of the Philippines and willing to act on this knowledge. In a country where Internet penetration levels were not very high, it decided at the start of its operations to include a directory of organizations not online, an "offline directory" (Silva, 1997). A few years later, it designed and implemented technology that allowed users to pay for online purchases using ATM cards. Again local conditions provided the rationale: the Philippines has one third the number of credit cards as it does ATM cards (Lopez, 2002).

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The company was also not shy in playing the nationalist card to the press. A few years after its launch, for example, the president was asked for the secret of its success and replied “It’s because we’re Filipino. We always try to go back to that” (Cabungcal, 2000). And Yehey! is a success story. It succeeded in attracting investors (initially WS Computer Publishing of the Philippines and Catcha.com of Singapore) and survived the dotcom crash around the turn of century. Since then it has unfailingly leveraged its local knowledge to develop web services and compete in the market for online advertising. Yehey! has also been able to more tightly integrate its advertisers into its operations by offering Web design, marketing, and traffic analysis services. In mid-2006, it recorded 30 million page views per month and 300,000 registered users (Estavillo, 2006), while in 2007 it recorded a profit of P8.6 million (Rubio, 2008). It has also attracted attention from search engine giant Google, which has agreed to collaborate with the company in developing tie-ins to its own advertising system (Yin, 2007; Rubio 2008). The well established nature of Yehey! makes it eminently in need of an analysis of its performance.

Method

Consistent with prior work in this area (e.g. Goh & Ang, 2003; Leighton & Srivastava, 1999), we randomly chose queries from a range of topics from sports to history, representing a wide variety of popular and more academic subject areas (see Table 1). In our work, a total of fourteen queries were used. Over a period of one month, these queries were used in searches using Yehey! and Google. In order to provide a legitimate set of data for comparison, the term “philippine” was added to the search string so that, for

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example, the search string for history was “philippine history”. Data from the first ten hits was collected from each set of search results and evaluated qualitatively by two independent evaluators. The evaluation included examining http://opus.unibw-hamburg.de/opus/volltexte/2006/723/pdf/2002_111.pdf the URL, name of the site, and the domain name. If available, the dates the site was created and last modified were also collected. In order to give a measure of the quality of the site, further information was gathered on whether it had a statement of responsibility (either an individual or organization), their credentials (for example, belonging to a professional association or institution, or evidence of higher education awards), and a statement of purpose (what aims the site hoped to achieve) (Alexander & Tate 1999). Finally, it was also noted if the URL was a dead link or led to a notice that the domain name was available for sale.

Findings

Dates Created & Last Modified

The date the site was created and the date it was last modified was collected in order to provide some indication of how current the results of the searches were. However, we need to keep in mind the fact that not all sites provided dates of initial creation or last modification so the numbers which appear in Figures 1 and 2 do not correspond to the number of search results returned.. Looking at these figures makes it clear that the overall range of site dates for Google is greater than for Yehey!. Whereas Yehey!’s earliest site was 1997, that for Google was 1995. However, both search engines tend to favour recent sites with a total of 59.9% of Google’s and 58.9% of Yehey’s top ten sites dating from 2005 onwards. This suggests that both search engines are regularly updated. However, for very recent sites this is not the case as only 21% of Yehey’s results from sites dating

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2007 or later whereas the figure for Google is 33%. Possible reasons could be because Yehey may be slow in updating its indexes, or its ranking algorithm may not have used Web page freshness as part of its criteria.

Domains

The domain under which each site fell was analysed in two ways. The first was to determine the number of commercial sites (for example, .com or .com.ph) as compared to non-commercial sites (.edu, .org, .gov and so on). This was done in order to gauge the extent to which the information sources referred to by the search engines are subject to the imperatives of selling and, by extension, the drive for profitability (it being assumed that most .com sites are commercial in nature). It provides in other words, a rough measure of the commodification of information. Table 2 sets out the data.

A total of 62 or 44.3% of the sites returned by Google fell into the commercial category. For Yehey!, the numbers were much higher. Sixty-nine of the total 120 sites (less than the expected 140 because some of the queries returned less than ten hits) or 57.5% were commercial. Overall then, it would appear that the information provided by Yehey! is the most subject to commercial considerations.

Of course, for some subjects, a preponderance of commercial sites is likely to be acceptable. People looking for travel information, for example, probably are interested in looking at hotel, airline and other offerings of the commercial tourism industry.

Similarly, sports and entertainment subjects are also reasonably likely to contain a large proportion of commercial sites. On the other hand, information concerning health matters or education is, arguably, better left to non-profit organization or the government.

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If we look at the data at the individual subject level, we find the results of the following Yehey! queries overwhelmingly commercial: economy (6:1), media (2:0), sports (8:2), and travel (10:0). Sports and travel have already been accounted for, but the fact that results for queries about a subject as important as economy are predominantly commercial is cause for some concern as is the fact that none of the sites returned for the media query were non-commercial. Could it be that for these subject areas, the web as a whole contains more commercial sites? If that were the case, the results from Google would likely be similar, but in fact they are not. The ratios for Google's results are: economy (7:3) and media (4:6).

There are further problems regarding the commercialization of Yehey's results for if one compares the results for subject areas that are likely to be better served by non-commercial information sources, one finds that Yehey! tends to always have a higher number of commercial sites than Google. In health, for example, the Google ratio is 3:7 whereas it is 5:5 for Yehey. History stands at 1:9 for Google and 4:6 for Yehey! while for science the ratio for Google is 3:7 and Yehey! 5:5. The conclusion, at least from the limited number of topics examined, is clear: Yehey! tends to favour commercial sites (as measured by .com or .com.ph) in its rankings.

The second analysis of the site's domain looked at the number of .ph (the country code top level domain for the Philippines) and non-.ph sites in order to ascertain to what extent were locally registered sites privileged by each search engine. A search engine specializing in the web content associated with a particular country should likely assign greater importance to material produced by sites associated with that country's domain space, all other things being equal Table 3 presents the data.

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The Google search returned thirty sites (25% of the total) registered under .ph whereas Yehey! returned thirty-three (27.5% of the total). Given the discrepancies in the total number of web sites returned between each search engines, the percentages are a better indicator of the presence of Philippine content, but the difference is still rather small, perhaps reflecting the actual distribution of web sites on Philippine topics.

Looking at individual subject queries for Yehey! we find that the following areas have significantly fewer sites registered under the .ph domain: business (1:9), economy (1:6), entertainment (0:10), food (1:9), history (2:8), media (0:2), sports (2:8), and travel (0:10). The Google queries that generate very few .ph sites correspond to this list to some extent: economy (0:10), entertainment (1:9), food (0:10), history (1:9), and sports (3:7), suggesting that the actual number of .ph registered sites for these topics is small to begin with.

Discrepancies can be found in the queries for business (3:7), media (3:7), and travel (2:8) where Google returned more .ph sites than Yehey!. Conversely Yehey! appears to do a better job for: health (6:4), education (4:4), and government (5:5).

Dead and Advertising Links

Dead links are those which point to non-existent pages and thereby generate an error message. In addition, we also define advertising links as those which take the user to a page announcing that the domain name under consideration is for sale. High numbers of dead and advertising links are a sign of a non-optimal search engine that is not updating its database as often as it should. Yehey! had a much higher number of such links, as

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shown in Table 4. Here, Yehey! had approximately 7 times more dead links and nearly 5 times more advertising links than Google.

Overlapping Sites

Does Yehey! provide coverage of sites that Google doesn't? The answer is yes. There was very little overlap between the two search engines. The query on Philippine food generated the most number of overlapping sites (three). On the other hand, the following queries generated no overlaps at all: economy, education, entertainment, media, and sports. Table 5 provides the results for each subject query.

Quality

Web site quality is a difficult concept to measure over such a wide number of subjects. However, there are certain indicators available that help give a rough impression of the quality of a site (e.g. Katz, 2002 Tillotson, 2002; Xie, 2007). These include whether it has a statement of responsibility (the name of the individual or institution who produced or is otherwise in charge of the content), statement of purpose (an explanation of why the site exists or what its goals are), the credentials of the author(s) and the dates created and last modified (which provide an indicator of how current the site is likely to be and how much trouble the site owner takes to maintain it). All the sites returned from the search engines were examined for these characteristics. Each characteristic was awarded one point and the totals for each engine summed up. Yehey! received only 27% of the total possible points (480). Google did better with a score of 38%, but this still amounted to less than half the possible points (560). Table 5 provides the scores for each subject query. An

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independent t-test showed that the differences were significant ($p < .003$), indicating that Google had a better quality score than Yehey!.

Evaluation of Relevance

As discussed earlier, two independent evaluators were assigned to evaluate the search results returned by Google and Yehey!. To achieve a finer-grained analysis, the evaluators coded a search result item as “useful”, “somewhat useful” and “not useful”. Further, “a useful” evaluation was coded with a score of 3, a “somewhat useful” evaluation was coded with a score of 2, and a score of 1 would be coded for “not useful” evaluations. For these evaluations, we achieved an inter-coder reliability of 0.9 which is within the acceptable range.

Next, these two sets of scores were analyzed statistically by using a one-way ANOVA test to determine whether Google or Yehey! returned more relevant results to the queries. As shown in table 7, the mean relevance score for Google was 2.43 while that for Yehey! was 1.41. Here, the maximum obtainable score for each search engine was 3 and the minimum obtainable score was 1. In addition, the ANOVA test showed that the difference in mean relevance score was statistically significant ($p < 0.01$). Put differently, our results suggest that Google’s results were more relevant to the queries than the results returned by Yehey!.

Discussion

In line with previous studies on the performance of local search engines (e.g. Smith, 2003), it appears more work needs to be done before they become serious contenders in

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the search engine arena. Of course, given the constraints facing an organization working in a developing country this may be difficult for Yehey!. In most of the dimensions examined in this study, Google out-ranks Yehey! (the exception is the number of sites registered under the .ph domain). It would therefore be easy to dismiss Yehey! as a less than serious information provider if there was any great degree of overlap of hits between it and Google. This is not the case and it creates the possibility that a useful site might not be found if one relied on just a single major search engine such as Google.

However, it is clear that Yehey! suffers from a number of characteristics that make it less useful than it should be as a purveyor of Filipino web content. The first, and perhaps most important of these, is its emphasis on commercial sites. Depending on the nature of the search topic this emphasis has more or less serious implications for the user who needs to be able to exercise considerable skills of information quality judgment as a result. This focus on commercial sites is further aggravated by the general quality of sites measured in our study by the presence of a statement of responsibility and purpose, the credentials of the author(s), and the dates created and last modified. Google is not a paragon of virtue here either, but it does consistently out-rank Yehey! in this regard. Again, the onus is placed on the user to be able to differentiate good quality from bad. Also of concern are the number of dead or advertising links found in Yehey!. While not of the same level of importance as the other characteristics mentioned it likely does make the user's search more frustrating. It is also a sign of a badly maintained search engine. Nevertheless, although Yehey! tends to perform poorly compared to Google, it should not be dismissed. Local search engines will increasingly be needed as more people turn to the Internet as a source of information about conditions in their immediate locales. With

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more resources and expertise Yehey! could yet become a serious provider of Philippine information.

Future Work

This study represents a start in investigating regional or local search engines in the Asian context. As the web continues to diversify and spread around the world, and especially Asia, the importance of regional search engines will likely rise as people continue to need information that suits their own local conditions. Further studies of these information tools are therefore needed that go beyond the limitations of this study. For example, more search engines need to be compared against each other using a wider variety of queries. In addition, their performance in terms of relevance of search results could also be investigated. Research is also needed most urgently in non-English language search tools. As well as focusing on the tools themselves, it is also necessary to explore how the user interacts with them. How do users decide to employ one search engine over another? What meanings do they assign to local as opposed to global search tools? And how aware are they of the limitations of each? These are only a few of the many questions that remain to be explored.

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Figure 1:

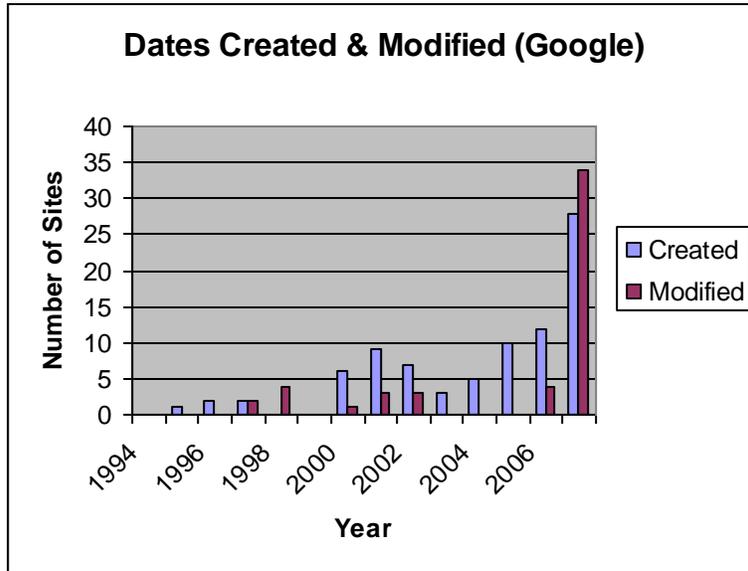
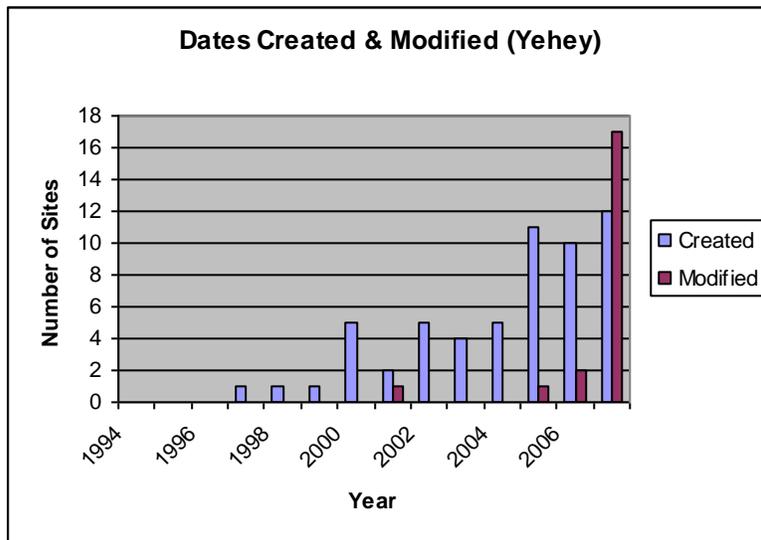


Figure 2:



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Table 1: List of Search Topics

Arts	Business	Economy	Education	Environment
Food	Government	Health	History	Media
Science	Sports	Travel		

Table 2: Commerical and non-commercial sites for Yehey! and Google

	Yehey	Google
Arts	5:5 *	5:5
Business	6:4	5:5
Economy	6:1	7:3
Education	1:6	2:8
Entertainment	9:1	8:2
Environment	0:4	2:8
Food	5:5	7:3
Government	3:7	4:6
Health	5:5	3:7
History	4:6	1:9
Media	2:0	4:6
Science	5:5	3:7
Sports	8:2	5:5
Travel	10:0	6:4
Total	69:51	62:78

* Commercial : Non-commercial sites

Table 3: .ph and non-.ph domain names for Yehey! and Google

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	Yehey .ph : not .ph		Google .ph : not .ph	
Arts	3:7		1:9	
Business	1:9		3:7	
Economy	1:6		0:10	
Education	Yehey	%	Google	%
Entertainment	12	0:9	30	14
Environment	13	4:0	33	16
Food	4	1:9	14	20
Government	5	5:5	18	10
Health	7	6:4	18	11
History	7	2:8	44	18
Media	16	0:2	40	16
Science	13	4:6	33	17
Sports	20	2:8	50	21
Travel	6	0:10	15	20
Total	2	33:87	25	12
				30:110
Science	11		28	15
Sports	3		7.5	7
Travel	12		30	16
Total	131		27	213
				38

Table 4: Quality scores and percents for Yehey! and Google

Note to Table 4: The Yehey! scores can be deceiving because for some queries less than ten results were returned. These include: economy, education, environment, and media. The percentage figures are more accurate as a result as they take the number of sites returned into account.

Table 5: Dead and Advertising Links for Yehey! and Google

	Yehey	Google
Dead Links	15	2
Advertising Links	14	3

Luyt, B., Goh, D. H. and Lee, C.S. (2009). Search locally: A comparison of Yehey! and Google. *Online Information Review*, 33(3), 499-510.

Table 6: Overlapping sites for Yehey and Google

	Number of Sites
Arts	2
Business	2
Economy	0
Education	0
Entertainment	0
Environment	1
Food	3
Government	1
Health	2
History	2
Media	0
Science	1
Sports	0
Travel	2

Table 7: ANOVA Results

Evaluation 1			Evaluation 2		
Google Mean (S.D.)	Yehey! Mean (S.D.)	F-value	Google Mean (S.D.)	Yehey! Mean (S.D.)	F-value
2.43 (0.78)	1.41 (0.72)	130.08	2.57 (0.74)	1.51 (0.75)	140.07