SEARCH ENGINE RANKING PROFILE MAINTENANCE - A CASE STUDY

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Abstract

The primary objective of this research project was to determine whether a test webpage will be able to maintain its high ranking with search engines after the Search Engine Optimisation (SEO) elements, as identified in the Chambers model, were implemented. The secondary objective was to determine how many of the test website's competitors were optimised for the keywords they wanted their potential clients to use to find their website using search engines.

The methods employed in this project include a full literature review on SEO, as well as an evaluation of the Chambers model. Previous empirical research has shown that the implementation of the Chambers model had a positive effect on a website's ranking with search engines. Further empirical work has been done to determine whether or not a website will be able to maintain its high ranking with minimal changes to the website itself over a period of one year.

Furthermore, a questionnaire was sent to competitors of the test website. Results were used to do a comparison between the visibility of the test website and its competitor websites. An independent software application was used to evaluate these sites.

The primary conclusion reached is that after implementing the Chambers model, the test website maintained its high ranking with search engines over a period of one year with no further optimisation or submission to search engines. The secondary conclusion reached is that a low percentage of competitors in the same industry were optimised for their own sets of keywords. SEO elements need to be revised constantly in order to ensure that they could be used as valid optimisation components.

Keywords: SEO, search engine, ranking, website visibility

1. Introduction

The correct use of search engines could assist users in identifying and assessing relevant information in the shortest time possible. For this process to be successful, the search query must be formulated correctly. This involves the nomination of keywords, perceived by the user to be the most accurate in describing the information need. Secondly, the way in which the website has been designed plays an important role. It should contain most of the SEO relevant HyperText Markup Language (HTML) tags which are available. This is to not only ensure that the website is indexed by search engines, but also to ensure that the website is ranked highly during a search. The difficulty is that website designers do not know the detail of operation of search engine algorithms, or the searcher's choice of keywords. Therefore the designer needs to make effective use of programming tools to achieve the objective of creating visible websites.

2. The Internet

The Internet is a collection of interlinked computer networks, or a network of networks. The Internet provides global connectivity via a mesh of networks. It was reported more than ten years ago that the Internet connects over one million different computers and the rate of increase in use and new subscribers is growing on a month-by-month basis (Rowley 1996). Furthermore, the Internet has undergone a significant transformation in the 1990s with the development of search engines. Some authors claim that there are an estimated 1.3 billion sites on the web, each providing publicly accessible information - over 1 million new websites are being added annually (Zhang & Dimitroff, 2005). Considering the rate at which webpages are created and/or destroyed, it is almost impossible to know exactly where to find specific information. These search engines provide access to this overwhelmingly complex information resource.

3. Search Engines

According to Kritzinger & Weideman (2005) search engines provide the average Internet user with a (mostly) free, apparently easy way to find general information on the Internet. They are programs that offer interaction with the Internet through a front end, where the user can type in a search term, or make successive selections of relevant directories. The search engine software then compares the search term against an index file, which contains information about many websites. Matches found are returned to the user via the front end. The index is updated regularly either by human editors or by automated programs (called spiders, robots or crawlers) (Weideman, 2005).

Search engines are the primary searching tools used for information retrieval on the Internet (Spink & Xu, 2000). Thelwall (2001) estimates that around 80% of users utilise search engines to search for information on the Internet. This places emphasis on the underlying importance of webpage owners being listed with search engines. An important strategy for any website owner is planning how visitors could find their way to their particular site (Thelwall, 2001). Green (2000: 125) provides a very basic definition of a search engine which reads as follows: 'A database that contains massive amounts of data about websites.'

According to Sullivan (2006) the companies that generates the most searches on the Internet are Google, Yahoo!, MSN, AOL and Ask (refer to Figure 1).

Figure 1: Percentage of searches done
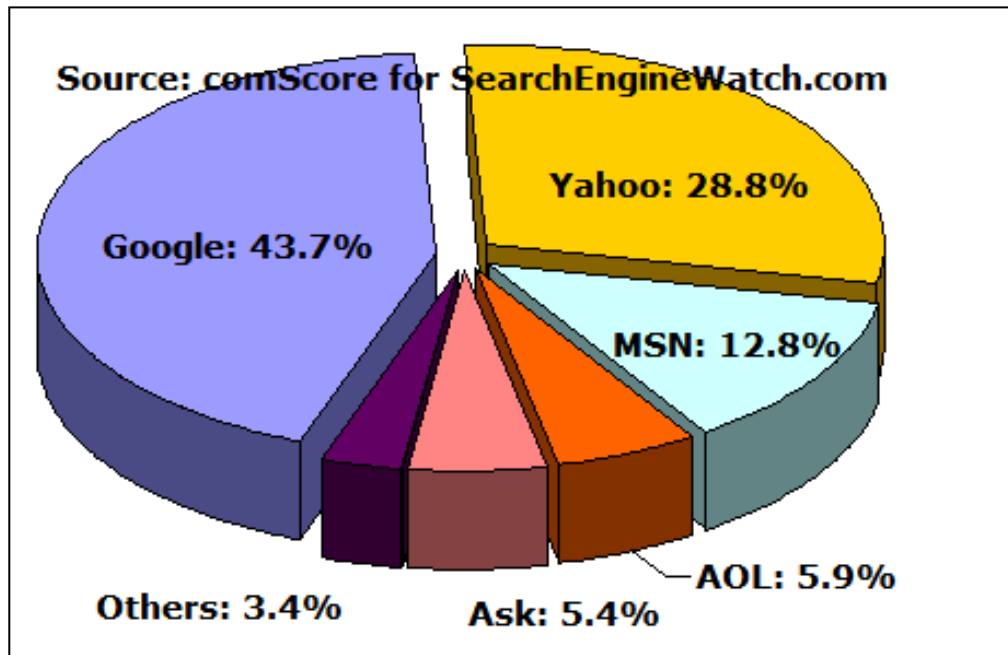
The data was taken from the comScore Media Metrix qSearch service which measures search-specific traffic on the Internet. qSearch data is gathered by monitoring the web activities of 1.5 million English speakers worldwide via proxy metering (Sullivan 2006). Each of the companies listed in Figure 1 consists of different sites whose results were combined into one overall figure for the company's entire network. For example:

- Google: Shows searches at any Google-owned website such as google.com or Google Image Search.
- Yahoo!:   Shows searches at any Yahoo!-owned website including those of AltaVista, AllTheWeb and Overture.
- MSN: Shows searches at any MSN-operated website such as MSN Search.
- AOL: Shows searches at any Time Warner-owned website, including AOL Search and Netscape Search.
- Ask: Shows searches at Ask and any site within the Ask-owned Excite Network, including Excite, iWon, MyWay.com and My Web Search.
- Other: Shows searches that occur at other search sites (Sullivan 2006).

4. Indexing & Ranking

Green (2000) states that the search engine database is compiled using a program known as a 'crawler', which visits sites and indexes them in a predetermined way. The index is updated regularly either by human editors or by crawlers. Both humans and crawlers simply collect information of new websites by visiting as many websites as possible, and then building them into the index (Weideman, 2005).

As the WWW expanded, it started to fall victim to criticism. Most users now are of the opinion that search engines tend to retrieve information that is irrelevant and contrary to what the user is looking for. Search engines have also been criticised for their tendency to retrieve duplicates (Green, 2000: 124-137). There are many different types of search engines, each using different ranking criteria to rank website surfaces. Most search engines have their own algorithms for this purpose - these algorithms are often trade

secrets, and only some superficial information about their operation is publicly available (Synder & Rosenbaum, 1999: 375-384).

5. Search Engine Optimisation (SEO)

The process of improving website visibility is referred to as SEO, which involves designing or modifying websites in order to improve Search Engine Results Page (SERP) ranking (George 2005:3). There are many techniques available to achieve this goal, and many of them resulted from the way search engine algorithms operate. The importance of ranking well in the SERP for queries on specific terms is undeniable according to Clay (2006a). Recent research on user behaviour shows that most users will ultimately click on a link within the first three pages. However, 62% of searchers only look at the first page of the search results. All this means that if a website are not in the top 10, few individuals will know it exist, and if the website is not in the top 30, it have almost no chance of being found (Clay 2006a).

This author further reports that organic search listings outperform Pay Per Click (PPC) listings three to one in click-through and are also known to achieve higher conversion rates (Clay 2006b). Search engine marketing (SEM) revenues increased from $4 billion to $5.75 billion in 2005 (US and Canada), a 44% increase over 2004 (SEMPO). It is predicted that search spending will increase to $11 billion by 2010 (Clay 2006b).

6. The Chambers Model

Chambers (2006) designed a model based on empirical experiments to improve the website visibility of a certain category of websites. This model highlighted a number of factors to consider when attempting to increase website visibility, by ranking them (lower figure = higher rank). See Table 1 for a summary of this model.

Table 1. The Chambers model for website visibility

Number	Leading Visibility Elements	Rank
1	Inclusion of meta-tags	1.5
2	Hypertext / Anchor text	2
3	No Flash or fewer than 50% of content	3
4	No Visible Link Spamming	4
5	Prominent Link Popularity	4.5
6	No Frames	5
7	Prominent Domain Names	7
8	Prominent Headings	7
9	No Banner Advertising	8
10	Prominent HTML Naming conventions	10

Another author (Visser, 2007) expanded this model to distinguish between visibility elements that must be included ("Essentials"), could be included ("Extras"), should be avoided ("Cautions") and must be avoided ("Dangers"). An adapted version of this model is given in Figure 2.

Figure 2. The (adapted) Visser model for website visibility.
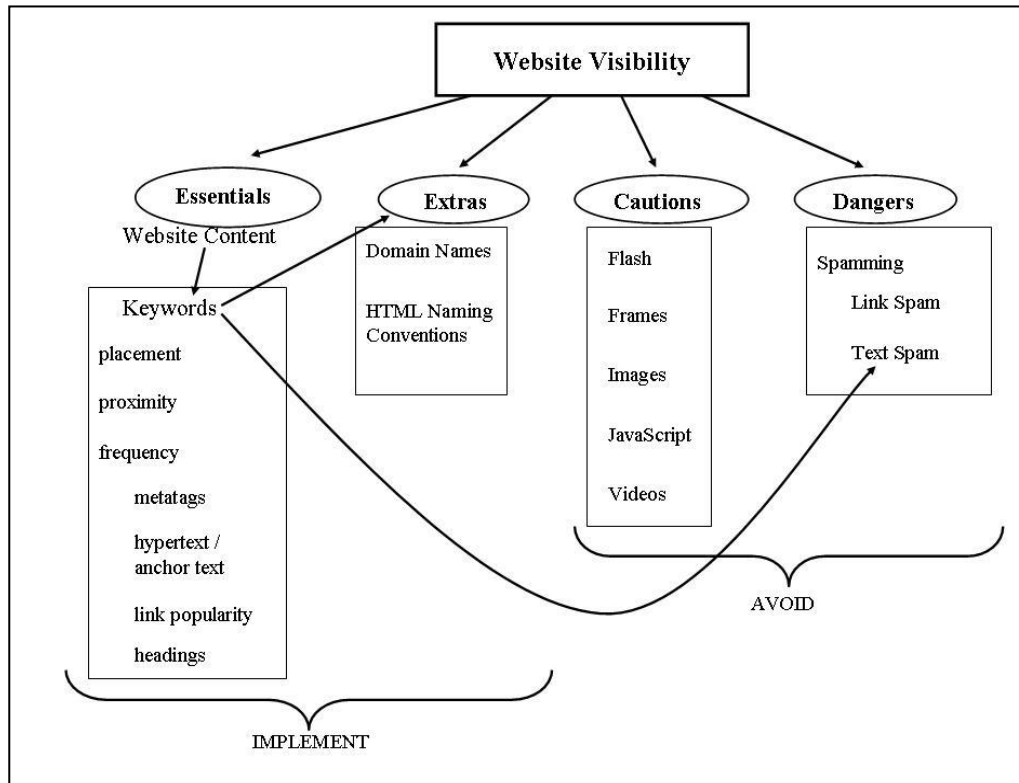
6.1 Meta-tags

Meta-tags are HTML meta-data that provides information about the content of the webpage (Thurow 2003:74; Weideman 2002:6). The original idea behind meta-tags was to provide information to the search engines about the website content along with keywords which are central to the theme of the webpage. Search engines relied on web developers' good faith when creating these meta-tags. According to Konia (2002:15-16), this system worked relatively well until the Internet became commercialised. The result was that search engines realised that they could not rely on good faith as web developers were including irrelevant keywords in meta-tags. This was done to manipulate search results without affecting viewable content of the webpage in the web browser (Thurow 2003:74).

The use of meta-tags can be summarised as follows: they should be included as secondary text in order to enhance website visibility for those search engines that do make use of meta-tags in some way or another (Thurow 2003:74-75).

Using keywords correctly throughout a website can be critical to search engine ranking (Clay 2006c). The first use of keywords is in the keywords meta-tag located in the header section of the page's HTML code. After carefully choosing the keywords that are relevant to the particular page, these should be placed in the keyword meta-tag (<meta name="keywords" content=" ">) in order from the longest to shortest phrase with the initial letter of each keyword capitalised. These keywords should also be placed strategically in the Title and Meta Description of the page. Search engines use the Title and Description (<meta name="description" content=" ">) as a summary of what the page is about, so placing keyword within those tags is always helpful (Clay 2006c).

6.2 Hypertext / Anchor text

Anchor text (often referred to as hypertext links or just links) typically consists of words underlined by the web browser, which provides access to another webpage location (Henzinger *et al.* 2002:5; Rowley 2001:356). Guenther (2004b:56) is of the opinion that visitors are often uncertain of where navigational links will lead them to. In order to solve this problem, web developers should create links that include targeted keywords which describe the destination (George 2005:57). This does not only take the guesswork out of navigation, but it also improves keyword density, which in turn improves website visibility (Thurow 2003:86). However, Thurow (2003:95) points out that too many links can interfere with keyword density, which in turn will not aid in webpage relevancy.

6.3 Flash

Macromedia Flash (or Flash for short) is a Scalable Vector Graphics (SVG) technology designed to allow a developer to animate graphics, text, sound, create interactive experiences, etc. Flash is currently the most widely used software tool to bring animation and interactive content to a website (Goh & Wang, 2004: 144). According to Chambers (2006) even though Flash improves the interaction between the user and the website, a developer should also study the visibility implications involved when making use of this technology.

Although a few of the major search engines can find some of the links embedded inside a webpage containing Flash, textual content is very difficult to extract (Thurow, 2003: 147). There are however ways to make use of Flash and still have a visible website. Thurow (2003: 151) recommends the coding of two separate websites, namely one that consists of Flash and a second one without it, and then providing an option for the user to choose which one to access. By giving the user this choice, the developer not only provides a Flash page with a high interactive design, but also a page with content rich keyword phrases.

6.4 Link Spamming

According to Chambers (2006) link spamming is relatively easy to identify on a website, as it usually comprises a collection of different links pointing to other sites with the sole purpose of raising its link popularity. Several authors (Notess, 1999: 86; Thurow, 2003: 225; Henzinger et al., 2002: 4; Van Steenderen, 2001) advise against the use of this kind of spam, since the majority of search engines have begun to implement safety measures which avoid and in some cases blacklist sites containing spam.

6.5 Link popularity

The link popularity of a webpage can be defined as the number and quality of links pointing to a specific webpage (Chambers 2006). According to Henzinger et al. (2002: 6), a search engine typically assumes that when a site provides a link to another site or page, it is because the author believes that the other site or page has relevant and information rich content. Domain spam (also called mirrored sites), is closely related to content duplication. It is the process where a developer purchases multiple domain names and then hosts websites with identical content under these different domain names. By using this technique, spammers anticipate multiple listings in search engine rankings through the boosting of the link popularity of the particular website, which could ultimately result in traffic increase (Thurow, 2003: 227). The use of this technique should be avoided at all times, as it could result in getting the site banned from a search engine's index. According

to Thurow (2003: 227), search engines have developed techniques to remove all mirror sites from their index.

6.6 Frames

The problem with frames is that the HTML code does not often consist of keyword-rich text (Thurow 2003:140). Furthermore, some crawlers may try to index frames but for the most part, encounter problems that have disastrous consequences, such as missing all the links on the website (Thelwall 2000:152). As a result, search engine crawlers often ignore frame-based websites completely or frame-based websites beyond the homepage (Thelwall 2000:152; Konia 2002:174-176; Ramos & Cota 2004:60). Thurow (2003:140) does make suggestions when insisting on the use of frame-based websites. According to Ramos and Cota (2004:60) and Thelwall (2000:152), however, it is recommended to not make use of frames at all.

6.7 Prominent Domain Names

In the online marketplace, Chambers (2006) is of the opinion that domains name play an ever increasing role in the visibility of websites. A well chosen domain name assigned to a website can have an influence on how users find and view the site. Furthermore, a well branded domain name can also have an effect on how staff, suppliers, business partners, the trade, regulators and providers of capital view a company (Chambers 2006).

Authors such as Callan (2004), Clark, Chou and Yen (2001: 225), Galon (1999: 46), Gorman (2000: 161) and Rowley (2004: 132) claim that website authors should try to keep domain names short and simple; meaningful, by making use of keywords; relating to the business; and easy to remember.

6.8 Prominent Headings

Search engines often rank keywords listed in headers higher than the keywords listed in the body text (Kritzinger & Weideman 2005; Nobles & O'Neil 2000: 43). This can be attributed to search engines often interpreting bold text as the beginning of a paragraph. The bold text is also more visible to the user and therefore could minimise the risk of indexing false keywords.

6.9 Banner Advertising

Banner advertising, which is more often than not also part of paid advertising, was believed to be the most used advertising medium on the Internet (Van Steenderen, 2001; Weideman & Haig-Smith, 2002: 285). This advertising medium involves bringing a URL to the attention of potential customers, thereby increasing the chance that they would visit the website being advertised. Banner ads according to Chambers (2006) often provide links, but seldom in the form of a hyperlink (URL). According to Szasz (2007) his website's ranking decreased after adding a 469 pixel banner ad at the top of every page for an affiliate. After Szasz (2007) removed the banner ad the website's ranking returned to normal.

6.10 Prominent HTML Naming Conventions

Prominent keywords should be used throughout a website. These keywords should be included in the HTML page names (URL). All page names, except the entrance page

name (index.html or homepage.html) should contain keywords in their naming conventions, not exceeding 30 characters and provide content rich information about the webpage (Galon, 1999: 56).

7. Methodology
7.1 Primary objective

The primary objective of this research project was to determine whether a webpage can maintain its high ranking with search engines after the SEO elements, as identified in the Chambers model (refer to Table 1) were implemented. Previous research done by Visser et al (2006) shows that after the implementation of the Chambers model the test website improved. In some cases, the ranking jumped from no ranking to number one position.

It was unknown at that stage what the long-term effects will be on a website's ranking after these SEO elements have been implemented. The authors waited for approximately one year, and in that time made no changes to the test website (www.louwcoet.co.za). The test website was then analised with WebPosition Gold 4, using the same keyword phrase used to do the original experiment in the published research of Visser et al (2006). Also, the website was tested using the same 25 search engines used in the original investigation of Visser et al (2006) (refer to Table 2). Results of this test are summarised in Figure 3.

7.2 Secondary objective

The secondary objective was to determine how many of the competitors websites were optimised for the keywords they wanted their potential clients to use to find their website using search engines. Similar websites were identified using a local online directory service (www.ananzi.co.za). The authors compiled a five question questionnaire which was sent to the competitors. The questionnaire included the following instructions:

- Write down your firm's website address.
- Write down a four-word keyword phrase which you want your potential clients to use to find your website using a search engine.
- Write down a three-word keyword phrase which you want your potential clients to use to find your website using a search engine.
- Write down a two-word keyword phrase which you want your potential clients to use to find your website using a search engine.
- Write down a one keyword which you want your potential clients to use to find your website using a search engine.

The authors then used the specified keywords to test the respondent's website using WebPosition Gold 4. The results are summarised in Figure 4, 5, 6 and 7.

8. Results & Interpretation

Figure 3 represents the summary of the Louw & Coetzee Attorneys (LC) website's performance after one year. Table 2 relates the numbers used on the x-axis of Figure 3 to the search engines. The x-axis (Search Engines) represents 25 search engines that yielded results within the top 30 and that were used in the previous research by Visser et al (2006). The y-axis (Ranking) represents the ranking result of the LC website across all search engines to the corresponding key phrase. A ranking of one implies that the URL appeared first on the screen of 30 results, which is the best result possible. Therefore, the

red line in Figure 3 reflects the perfect situation – an (imaginary) website which appears first on all 25 SERPS.

8.1 Primary results

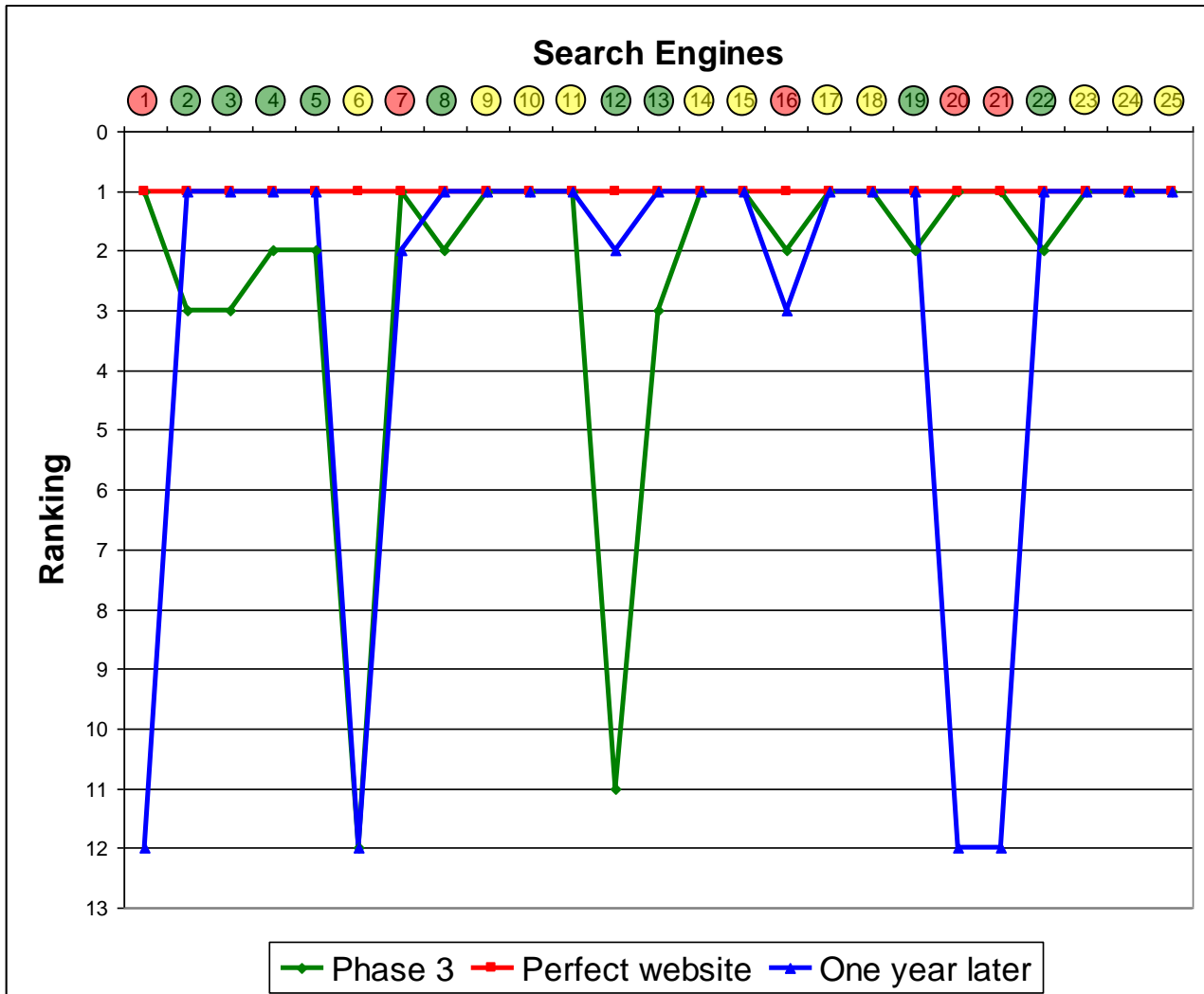**Figure 3: Louw & Coetzee Attorneys website's performance after one year**

Table 2. Search Engines used for tests

1	A9.com	6	ExactSeek	11	ICQSearch	16	Mamma	21	WiseNut
2	AllTheWeb	7	Excite	12	ISleuth	17	MSN	22	Yahoo! Web Results
3	AltaVista	8	Go	13	Ixquick	18	Netscape	23	Google.co.za
4	AOL Web Sites	9	Google	14	Jayde	19	Search.com	24	za.msn.com
5	Ask	10	HotBot	15	Lycos	20	Webcrawler	25	Mweb.co.za

It follows that the closer any line approaches the horizontal red one at point one, the better the website visibility is. On the other extreme, a value of 12 was chosen to represent "not indexed", which implies that the search engine either did not visit the website, or did, but found it unsuitable to index within the top 30.

Phase 3, which is indicated by the green line in Figure 3 represents the results of the LC Attorneys website from the Visser et al (2006) final test. The blue line in Figure 3 is the new test that was done approximately one year after the final test of the research by Visser et al (2006).

The green circles on the x-axis represent all the search engines where the LC website improved in ranking over the last one year. The yellow circles on the x-axis indicate all the search engines where the ranking remained the same. Lastly, the red circles show all the search engines where the ranking decreased.

From Figure 3 it can be seen that of the 25 search engines tested, nine of them showed improvement from Phase 3 to the situation a year later. Five of these nine search engines, however, are affiliated to three of the top five search engine companies (in terms of generating searches) namely Yahoo!, AOL and Ask. (Sullivan 2006). It can also be seen that of the 25 search engines, 11 showed no improvement or decrease in ranking. However, 10 of these 11 search engines show that the ranking remained unchanged on position one, which is the best position a website can achieve on a SERP. It should also be mentioned that five of these 10 are affiliated to four of the top five search engine companies (in terms of generating searches) namely Google, Yahoo!, MSN and AOL (Sullivan 2006). Therefore, the authors see this as a positive and not a neutral result as one would assume. Five of the search engines as seen on Figure 3 showed a decrease in ranking over a period of one year. Only one of these 5 is affiliated to one of the top five search engine companies (in terms of generating searches) namely Ask (Sullivan 2006).

8.2 Secondary results

Figure 4, 5, 6 and 7 shows the test results of the competitor websites. Table 2 relates the numbers used on the x-axis of Figure 4, 5, 6 and 7 to the search engines. The x-axis (Search Engines) represents 25 search engines that yielded results within the top 30 and that was used in the previous research by Visser et al (2006). The y-axis (Ranking) indicate the ranking result of the LC website and competitor websites across all search engines to the corresponding key phrase. A ranking of one implies that the URL appeared first on the screen of 30 results, which is the best result possible.

It follows that the closer any line approaches the horizontal line marked "1", the better the website visibility is. On the other extreme, a value of 21, 24, 26 and 22 (representing "just outside the 30 limit") was chosen to represent "not indexed" for Figure 4, 5, 6 and 7 respectively, which implies that the search engine either did not visit the website, or did and found it unsuitable to index within the top 30 search results.
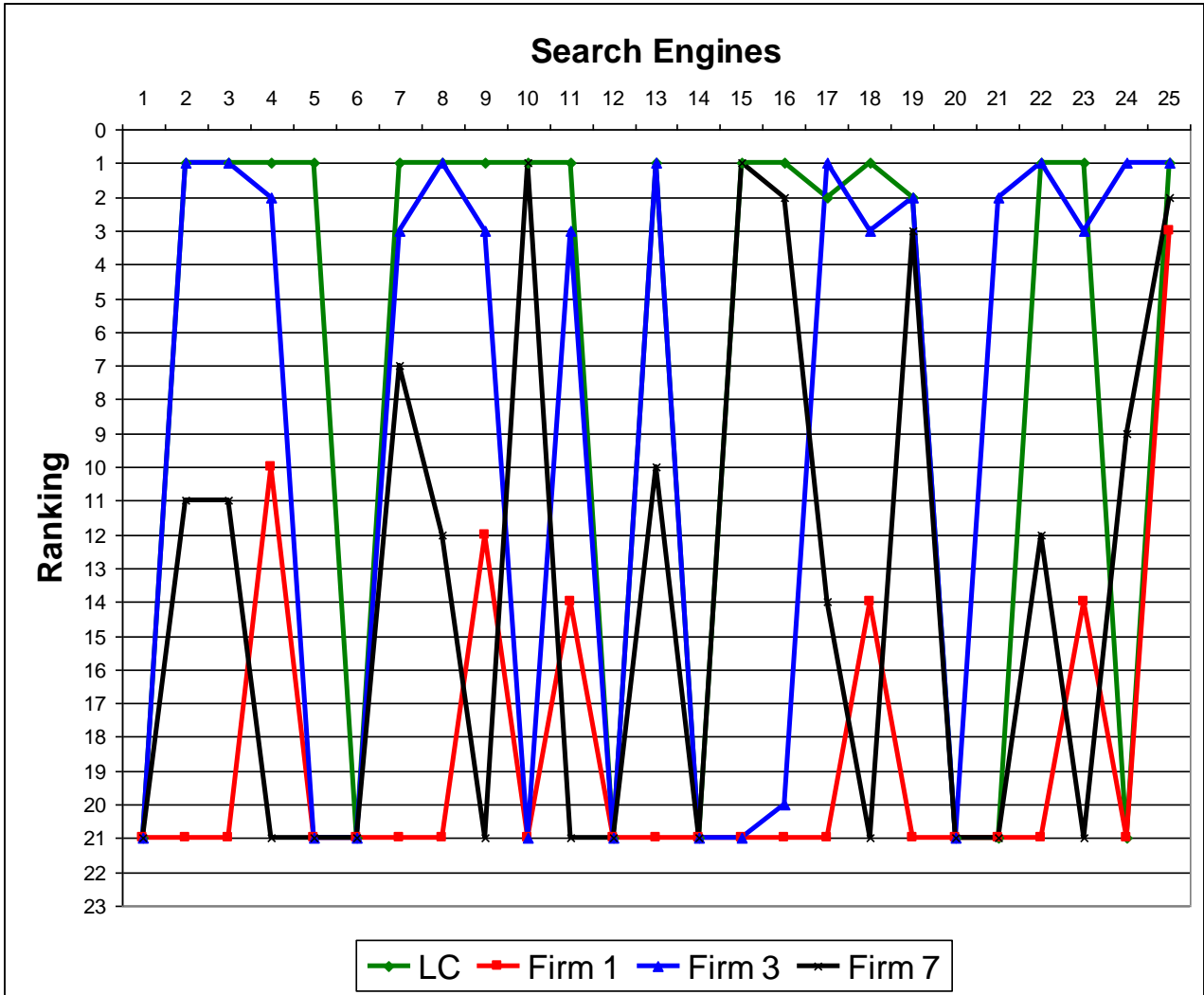
Figure 4: Four-Keyword phrase test results

Figure 4 represents the summary of the test results when a four-keyword phrase was used. The LC scored 15 first positions out of a possible 25 search engines. The closest competitor (Firm 3) scored eight out of 25 followed by Firm 7 with two out of 25. Firms 2, 4, 5 and 6 were omitted from this result summary because they had no results within the top 30 of any of the 25 search engines tested.

It is important to note that it is much easier to gain a number one position with search engines if the website was optimised for a four-keyword phrase. It becomes increasingly more difficult to obtain a number one position for a three-, two-, and one-keyword phrase.

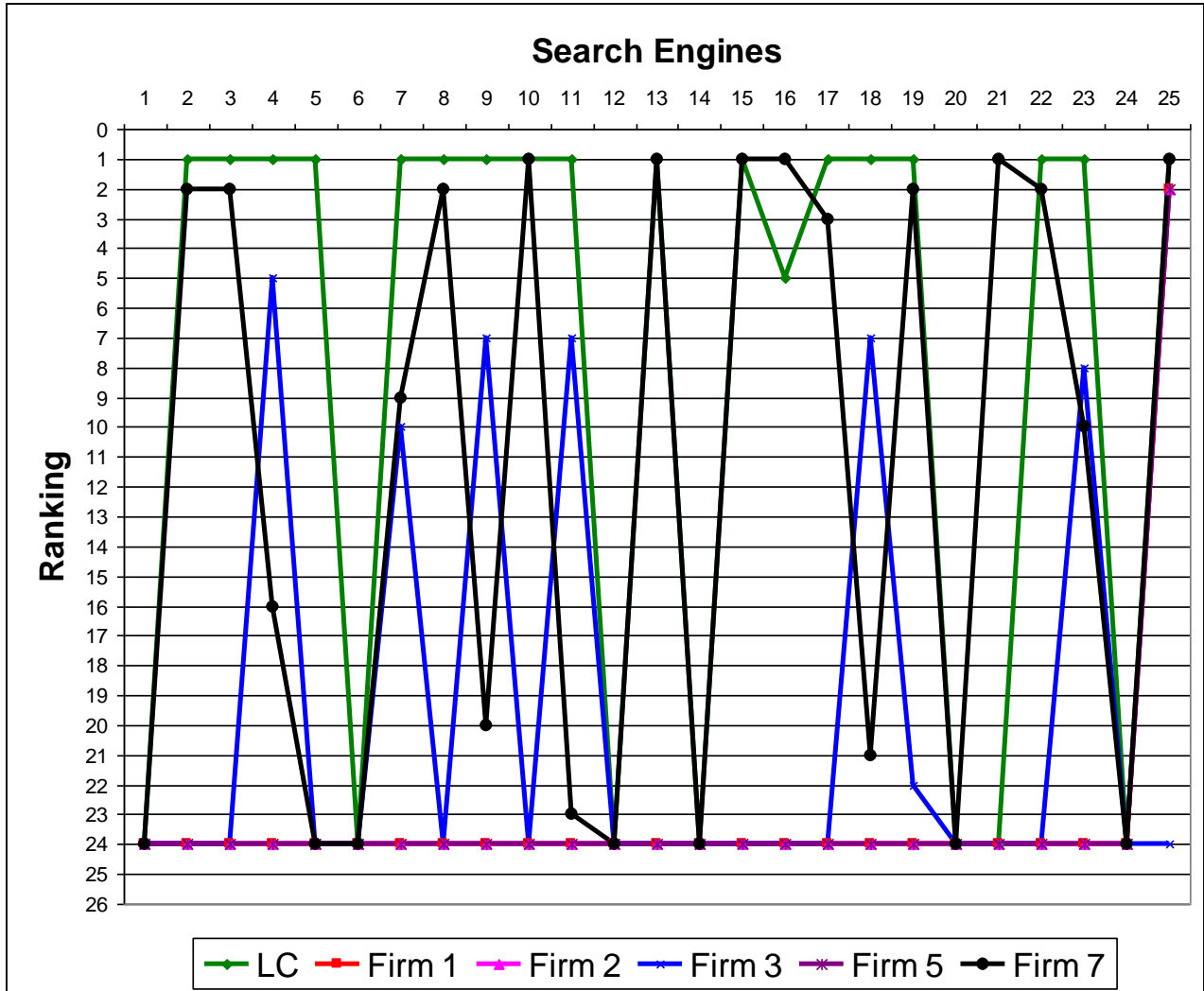**Figure 5: Three-Keyword phrase test results**

Figure 5 represents the summary of the test results when a three-keyword phrase was used. The LC scored 17 first positions out of a possible 25 search engines. The closest competitor which is Firm 7 scored six first positions. Firms 4 and 6 were omitted from this result summary because they had no results within the top 30 of any of the 25 search engines tested.
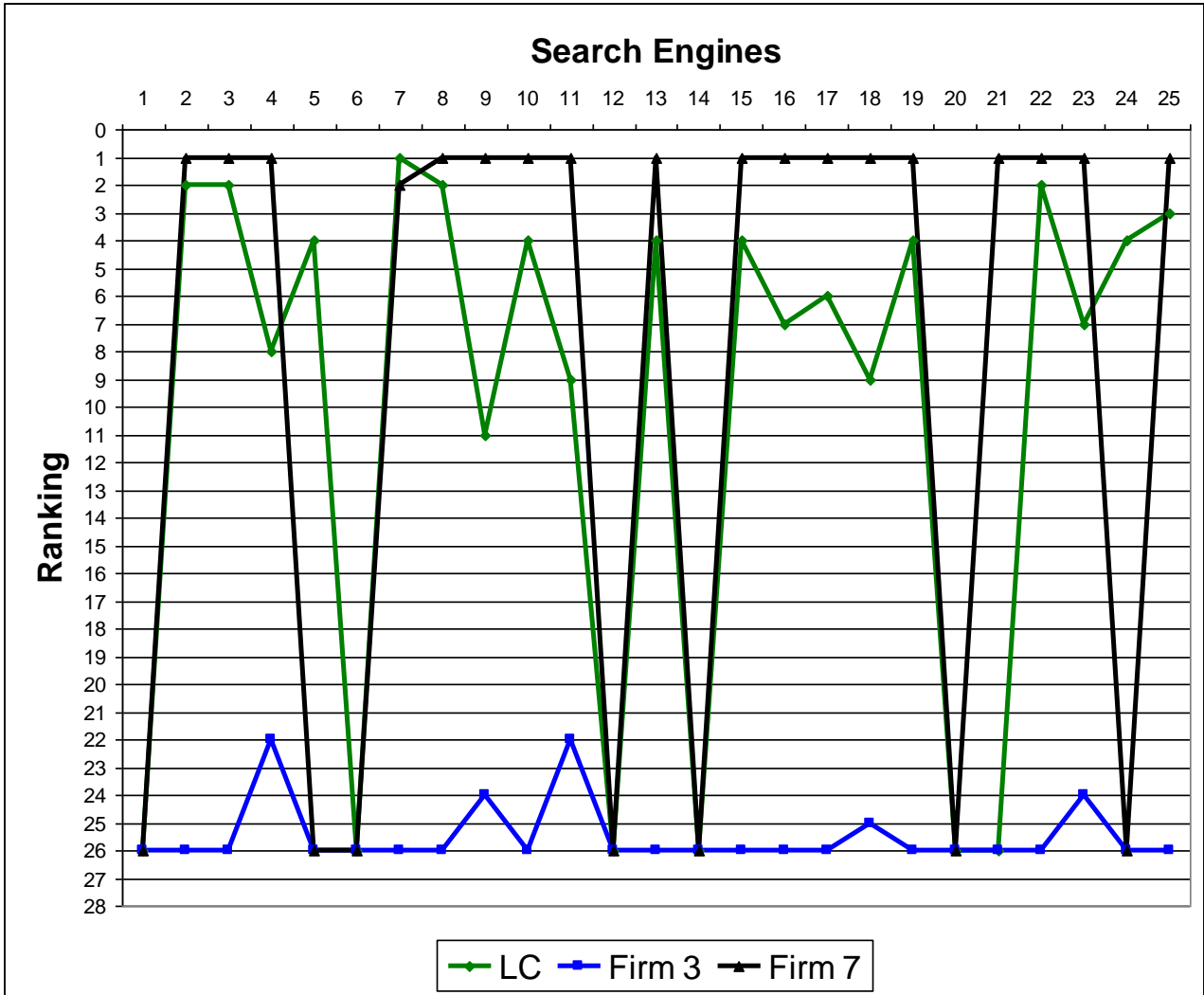
Figure 6: Two-Keyword phrase test results

Figure 6 represents the summary of the test results when a two-keyword phrase was used. Firm 7 was the clear leader in this test. Firm 7 scored 17 first positions out of a possible 25 search engine. Firm 7 is followed by LC with one first position and various scores between positions two and 11. Firms 1, 2, 4, 5 and 6 were omitted from this result summary because they had no results within the top 30 of any of the 25 search engines tested. It is important to note how many of the Firms have dropped out when a two-keyword phrase test was run. As mentioned before, it becomes ever increasingly more difficult for a web designer to optimise a website for two- or one-keyword phrase.
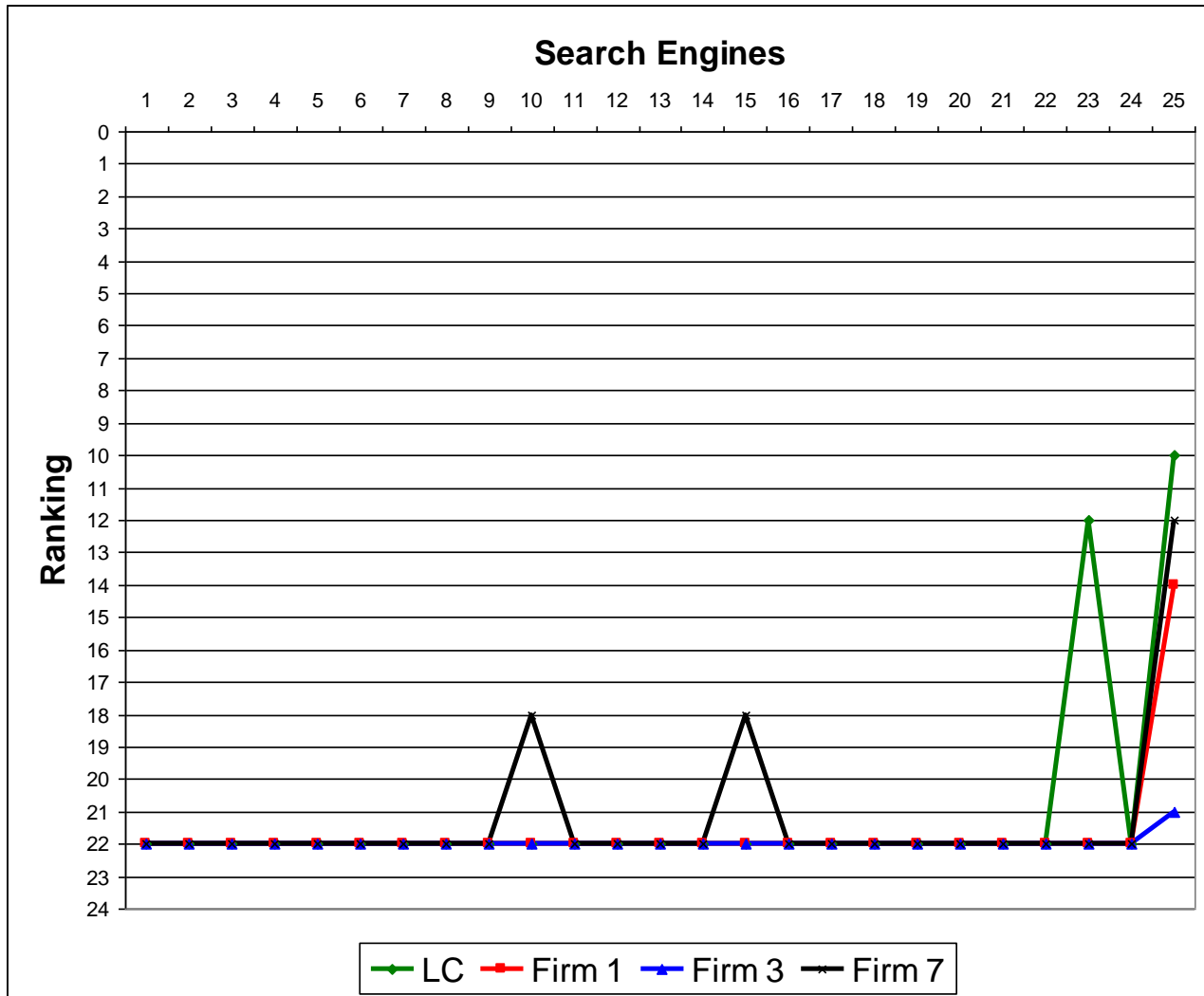
Figure 7: One-Keyword test results

Figure 7 represents the summary of the test results when one keyword was used. Figure 7 paints a clear picture on how difficult it can be for a website to be optimised for one keyword. The best ranking achieved was by LC, tenth position at one search engine. Firms 2, 4, 5 and 6 were omitted from this result summary because they had no results within the top 30 of any of the 25 search engines tested.

9. Conclusion

9.1 Primary Conclusion

An interpretation of Figure 3 shows an overall improvement in ranking since the previous year. It is important to note that since the final test (Phase 3: refer to Figure 3) there have been no modifications to the LC website in terms of SEO and content updates. It can be concluded that it is possible for a website to maintain its high ranking in the long-term after the SEO elements, as identified in the Chambers model (refer to Table 1) were implemented. However, this course of action is not advised. Web developers should take into account that search engine algorithms frequently change, which could impact SEO elements negatively (or positively) in terms of search engine rankings. As a result, SEO elements need to be revised all the time in order to ensure that they could be used as valid SEO components.

9.2 Secondary Conclusion

Table 3: Overall Results

	4 Key-words	3 Key-words	2 Key-words	1 Key-word	Overall total	Out of a possible	Percentage	Final Results	
LC	7	8	10	21	**46**	93	49%	51%	1st
Firm 1	19	23		22	**64**	67	96%	4%	4th
Firm 2		23			**23**	24	96%	4%	4th
Firm 3	9	20	25	22	**76**	93	82%	18%	3de
Firm 4					**0**	0		0%	Last
Firm 5		23			**23**	24	96%	4%	4th
Firm 6					**0**	0		0%	Last
Firm 7	14	11	8	21	**54**	93	58%	42%	2nd

Table 3 provides an overall result summary of the four tests. The authors calculated the average ranking a website has achieved across the 25 search engines tested. This was done for each firm across all four tests. However, if a firm had no results across all 25 search engines, it was omitted from the calculations. Each firm's results were then added to give an overall total. It should be noted at this point that because the tests is about ranking it means that the lower the score the better the result is. A percentage was then calculated for each firm using the overall total and the maximum a website could score. This percentage was then reversed (100 – value) in order to reveal the true result.

From Table 3 it can be seen that the LC website gained a score of 51% which earns it the first place in terms of visibility. Firm 7 achieved the second highest score of 42% followed by Firm 3 with 18%. Firms 1, 2 and 5 have a joined fourth place while Firms 4 and 6 share the last place.

Upon closer inspection of Firm 7's website it was discovered that Firm 7 makes use of a web design and marketing company, which would explain the good results from the author's tests.

The LC website has performed very well throughout the tests. These results prove once again that the Chambers model does in fact improve a website's ranking with major search engines. It is not necessary for companies to spend inordinate amounts on paid placement, or other schemes which claim to guarantee high rankings.

Finally, it is clear that there is a general trend of the graphs to "slide downwards" as one compares first four word, then three word searching down to one word searching. This trend confirms a similar one identified by other authors (Weideman & Strümpfer, 2004), and indicates better search results when using more keywords rather than fewer.

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