

Expanding Your Web Presence

Overview

Most Search Engine Optimization (SEO) companies understand the concept and implications of Google PageRank. However, many website designs are not constructed with PageRank considerations.

The equation for PageRank is:

$$PR(A) = (1-d) + d(PR(t1)/C(t1) + \dots + PR(tn)/C(tn))$$

Where:

- 't1 - tn' are pages linking to 'A'
- 'C' is the number of outbound links on that page
- 'd' is a damping factor, typically set to 0.85.

In order to run the equation, you must know all the pages linking to 'A' and the PageRank of each of these linking pages. The only way to perform this calculation is to iterate: run the equation many times, typically 20-40 times. In order to determine the true PageRank of any page in Google's index, you must be Google: have an index of how all website pages are connected to each other.

In laymen's terms, PageRank is a measure of the interconnection or popularity of any one website page as measured by links from other website pages. It is commonly thought of as 'votes'. The more links or 'votes' from other website pages, the higher the PageRank score. But there is one more element to the equation. The value of a 'vote' from a website page is divided by the number of outbound links (total 'votes'). So then links or 'votes' from pages that have fewer outbound links cast more of their voting power to a page.

Google expresses PageRank on their Google Toolbar: a score between 1 and 10 (10 being best). The true calculated PageRank, however, is a different number. The Google Toolbar score is a linear range of the real values that are more likely a logarithmic scale (e.g. PR=5 is 10x better than PR=4; 100x better than PR=3, and so on).

Navigation Architecture

Optimally crafted navigation or link structures will increase PageRank on target pages. This increased PageRank provides better opportunity for higher SEO ranking within Google's SERPs (Search Engine Results Pages).

At this juncture, it is important to note that the way a visitor navigates through a website can be different than a search engine crawls a site. A visitor can navigate through links that are constructed inside

scripts – search engines can only navigate through HTML links. That means optimal navigation architecture can be constructed to satisfy the needs of both visitor and search engine at the same time.

Consider this typical navigation bar architecture.



A single level (not drop down) navigation bar is used on each page so visitors can navigate to just about anywhere on the website. With the exception of B1-B3, each page is connected to each other. This is sometimes called "fully meshed" navigation architecture. A multi-level navigation bar would link B1-B3 with each other page.

Applying the PageRank calculation to this scenario is relatively easy.

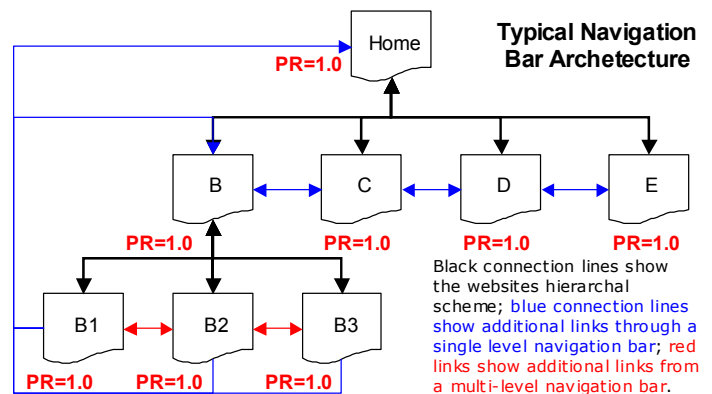


Figure 0: Each page is linked to each other.

In the case of the multi-level navigation bar where every page is connected to every other page, all the pages have the same number of inbound and outbound links. Consequently, the PageRank of every page on the site is the same and is represented by a nominal value **PR=1.0**. No page has an advantage over any other page.

If, however, the same multi-level navigation bar were constructed using the 'nofollow' attribute, Google would find only one website page. Google, like other search engines, starts to crawl all websites through their home page. It examines the home page and looks for links that lead to other pages. But, if these links are constructed with the 'nofollow' attribute, Google, like other search engines, will not follow them. Google would never know the other pages exist.

It is for this reason that many webmasters incorporate 'footer' HTML navigation. Google reads the HTML links but does not follow links with the 'nofollow' attribute in them.

Website Navigation Architecture (continued)

Now, consider adding 'footer' HTML navigation in such a way that will maximize PageRank. HTML links are placed on the home page directing the search engine crawler to pages B through E. Page B has HTML links to pages B1 through B3. Each interior page has an outbound link pointing back to the home page but not to each other (figure 2).

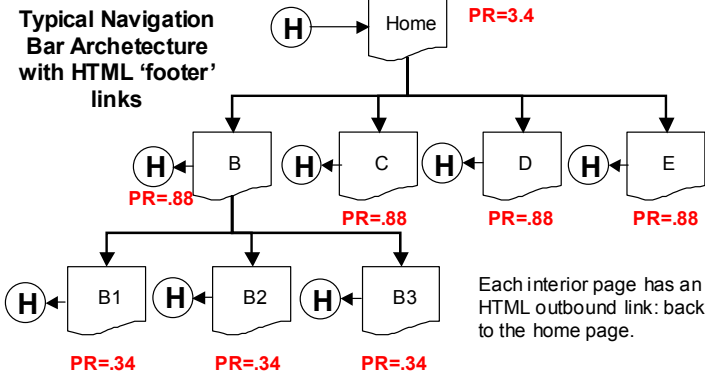


Figure 2: Add HTML links in the page 'footer'.

In this case, the PageRank of the home page is 3.4 times greater than in our first example. However, the interior pages suffer for lack of inbound links. From a search engine optimization perspective, the home page now has the best chance of attaining the highest Google rankings.

Very large websites that are dynamically generated may not be able to customize unique 'footer' HTML links for each interior page. In these cases, it may be best to use a sitemap. In this scenario, an HTML sitemap link is placed on the home page as the only search engine crawlable link. Then the sitemap page has HTML links that point to all other pages. All interior pages have one outbound link back to the home page.

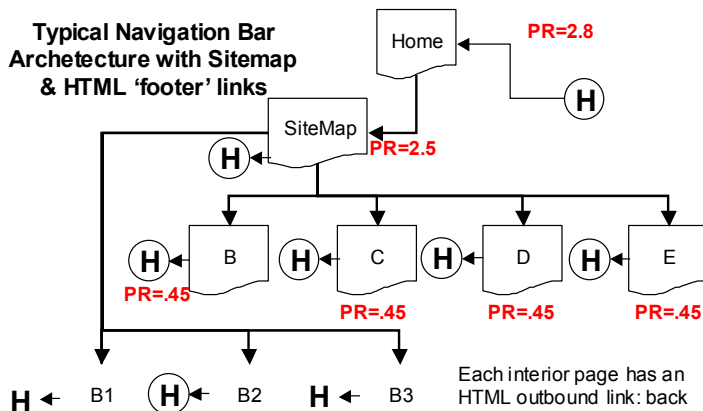


Figure 3: Use sitemap to lead search engine.

From a search engine perspective, it looks like the website is 'flat' (figure 3).

The results are not as good as the previous example, but much better than a fully meshed navigation architecture.

In some cases, it is desirable to increase the PageRank of one or many interior pages. This strategy would apply when trying to optimize a website for many competitive keywords. The keywords can be broken into smaller groups. Each interior page is then optimized for one group of keywords.

In this example, pages B1 through B3 have HTML links back to page B.

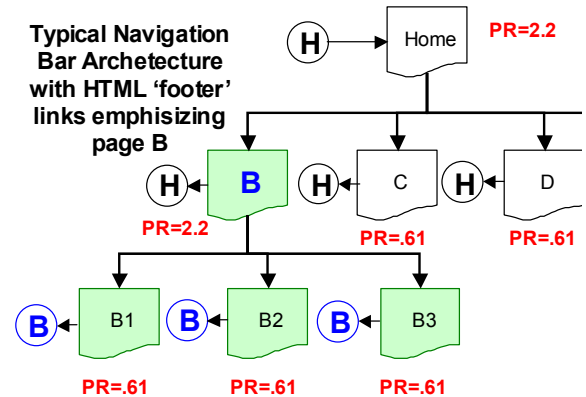


Figure 4: Target interior pages.

Page B's PageRank becomes 2.2 times higher than a fully meshed website page (figure 3). By eliminating the home page link on page B, PageRank is changes to 2.8 (the home page slips to 1.2).

If pages C, D, and E each had interior pages, they too could be PageRank optimized.

JavaScript and 'nofollow' attribute

As of mid 2005, Google and other engines recommend using a nofollow link attribute.

```
<a href="http://www.yahoo.com" rel="nofollow">link</a>
```

JavaScript used to a common method for preventing search engines from crawling certain links. However, some search engines like Google have been known to read links in basic JavaScript code.

```
<a href="http://www.yahoo.com" onclick="window.open(this.href, ', '); return false;">link</a> - or- <a href="javascript:window.open('http://www.yahoo.com', ', ');">link</a> (as of mid 2005)
```

The most secure method of blocking search engine from following JavaScript links is to use off page JavaScript: .js files. This script calls a file named sample .js.

```
<script language="javascript" type="text/javascript" src="sample.js"></script>
```

The sample.js file contains the link reference.

```
document.write('<a href=http://www.yahoo.com target=_blank>yahoo</a>');
```

For an extra step of security, the sample.js file can be named in a robot.txt file.