The Content and Visibility of Green Building Practices on Commercial Construction Company Websites

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The number of buildings being erected using sustainable principles has risen, in part due, to environmentally conscious consumers and government incentives. For construction companies wanting to provide green building services, it is important to consider marketing these services in an accessible and effective manner. This study uses an evaluation form to collect data from company websites related to sustainable construction terminology. This data is used to determine the content and visibility of green building practices on construction company websites. This evaluation form is concerned with the initial impact of the website, the quantity of the content, the type of content, the accessibility of the content on the websites search engine as well as an external search engine. The study then compares the evaluation of a company with its revenue and the quantity of green building projects they produce. These comparisons are used to determine the effectiveness and necessity of advertising green building practices on company websites.

Keywords: Environmental Design, Energy efficient homes, Green buildings, Intelligent construction, LEED, Sustainable construction, Technology buildings, US-Green Building Council, , Websites, Zero energy homes

Introduction

The necessity of offering green building practices is becoming increasingly apparent in the construction industry. By the end of this year non-residential construction, utilizing the principles of sustainable construction is expected to represent over 21 billion dollars according to Building Construction handbook, 2008. It is vital for the construction companies to present knowledge of these principles and experience in sustainable projects to market themselves for potential customers. Websites are a common marketing tool that can be used to express the company's commitment to sustainability in a way that is easily accessible to prospective clients.

Problem Statement and Objectives

This study analyzes a company's website content and compares it with the quantity of green building the company performs. This comparison is used to determine how commercial construction companies are marketing their green building credentials via Internet.

Review of the Literature

The United States of America has become increasingly environmental conscious(Ottman, Jacquelyn A. 1998. 'Green Marketing'). This shift has made its way into the construction industry, yielding green building practices. Environmental Marketing can be used to a company's advantage in reaching environmentally conscious consumers. Similarly, companies in the construction industry may find it advantageous to market their green building practices to future clientele.

The baby boomer generation represents a large portion of our population. In 2005 they accounted for 26 % of the US population (US Census Bureau, 2007, 2008). This is the generation responsible for the first Earth Day, The Endangered Species Act of 1973, the Clean Air Act of 1970, and the Clean Water Act of 1972.Ranging in age of 44 to 62, these individuals are now in authoritative positions in companies across the US. They have the clout now to implement change, a change toward environmental consciousness. Grade-school children are another important demographic. Most states are now requiring that environmental issues regarding each subject in Kindergarten through the twelfth grade be taught (Ottman, Jacquelyn A. 1998. 'Green Marketing'). With the baby boomers in charge and American children being taught from an early age about the environmental repercussions of their actions, it is clear to see that environmental responsibility is not just a fad, but here to stay. Business efforts to minimize their impact on the environment in the past have not been a top priority. Today, however, that is not the case. In many markets an environmental focus is essential to a business's survival. While one company tries to save money by not investing in the environment their competitors will be improving their skills, creating problem solutions, forming innovative processes, and finding ways to cut costs (Frause, Bob and Colehour, Julie. 1994. 'The Environmental Marketing Imperative'). In other words, those companies investing in environmental practices are creating a competitive advantage and the companies who do not fall further behind. In order to gain a competitive advantage companies should look at three areas: differentiation, low cost, and focus (Yudelson, Jerry. 2006. Marketing Green Buildings). This means companies need to present a sustainable focus. It is necessary for potential clients to know what sets the company apart from other green companies; in other words what is their brand image. Companies must prove to their clients that they can produce their product efficiently. Finding ways to lower costs will always be helpful, especially in an industry that relies heavily on bidding to obtain projects. It is also important to know what markets to compete in and which to avoid. The environmental conscience of Americans has an increasing amount of consumers purchasing green products and supporting green practices (Ottman, Jacquelyn A. 1998. 'Green Marketing'). It is, therefore, important to make sure the public knows about the efforts a company has taken to offer such things. However, 51% of Americans cannot list a company that considers themselves green (Aaker, David A. 2007. Strategic Market Management). This observation suggests that companies must improve their marketing strategies. One efficient and also waste free way of marketing companies' environmental efforts is over the Internet (Ottman, Jacquelyn A. 1998. 'Green Marketing').

As with any other industry, the Construction industry is finding that investing in the environment is a good way to get ahead. A survey done by Turner Construction Company found that 75% of executives working with green buildings received a higher return on their investment than with conventional buildings (Yudelson, Jerry. 2006. Marketing Green Buildings).

Experts predict that by 2010 the number of LEED certified buildings will reach 9,500 (Yudelson, Jerry. 2006. Marketing Green Buildings). They also believe that the market will account for $26.5 billion in construction by that time, as well. It is easy to see that the green building market is growing dramatically. Construction professionals wanting to take advantage of the growth should do their best in marketing themselves to the clientele in that market. The industry needs a greater use of modern sales tools to better connect with customers and convey their sustainable construction goals (Yudelson, Jerry. 2006. Marketing Green Buildings). One such marketing tool is the World Wide Web.

The green building industry is growing rapidly. Certain key phrases and certain types of information explaining the company's use of these practices can be used to market these practices. The internet is one marketing tool that is being used today. Most construction companies have websites, but are they using them to the best of their ability to market their green building practices?

Research Methods

This study uses data collected from construction companies' websites to determine their green building content. It also investigates the visibility and accessibility of this information to individuals on the World Wide Web. After the collection, the data was reported and analyzed in an effort to better understand how well the industry is marketing green building practices.

Data Collection

The companies used in this study were selected from the top 150 of Engineering News Record's top 400 General Contractors. This published ranking is based on companies' annual revenue (ENR. 2008. Top 400 General Contactors). Using this data, a list of the top 150 companies was generated in Microsoft Excel. Thirty random companies from this list was selected for the study with two criteria .i.e. The company selected should have websites with search engines and the company should practice commercial construction. If it is determined that one of the companies on the randomized list does not meet these two requirements in will not be included in the study.

The assessment of the websites is performed using a website evaluation form created specifically for this study. This form is made up of two focal areas: initial impact and content. The first section is made up of three questions. The purpose of these questions is to establish how visible and accessible a company's green building practices are from their website's homepage. Question one requires the use of the web browser's find tool. The words of interest are: *green, sustainable/ sustainability, environment/ environmental, and LEED*. These words were chosen due to their use by many popular organizations. The second question in section one requires scanning the homepage for the words of interest, if there were no results from question one. This may occur for example if the website uses a rollover as a way to view a navigation menu. Question three determines whether those words can be used to access related information or if they are merely stated on the page.

The second section of the evaluation form involves the use of a matrix to determine the website's content. Completing the matrix involves using the website's search engine. A search on each

word is conducted and the number of results was recorded. Each web page's results for each descriptive word, up to the first 50 results, is examined. The relevance of the web page to the study is determined by a subjective review. Pages that are found to be irrelevant are disregarded. A word used in the incorrect context, is one reason for dismissal. If for instance a web page found in the "green" results uses the word green to describe the color of a product, that page is not pertinent to the study. Another reason for determining irrelevance is if the word is only mentioned, but not expounded upon. This may occur on a page listing the company's projects. A LEED - certified project may be listed, but the page itself is not about that building or the green building practices used in its construction, and thus the page is not of importance. The next step in section two is determining what the purpose of the web page is. Each page will be given at least one of the following descriptions: case study, client testimonial, vision statement, informational, and/or promotional. Another area the matrix will cover is the level of a page within a website, or how deep within the website the page is located. The first level is the homepage and any page directly linked to the homepage is on the second level and so on. This can be determined by manually working through the website or by counting the number of sections separated by a back slash in a web page's URL. After determining the position, each web page was searched using the descriptive words. Each word found on the page was documented. Pages are not to be listed twice on the content matrix.

Finally each company is ranked on their website's content and visibility of green building practices, then that ranking is compared with their ranking on the ENR list of the Top Green Contractors to conclude if and to what extent the rankings agree or differ.

Findings

The evaluation form results were used to rank the companies based on the degree to which they market their green building practices on their website. These rankings were then compared with the ENR Top Green Contractors list.(ENR. 2008. Top 100 Green Contactors).

Section 1

After reviewing the data collected in part one of the evaluation form, "Initial Impact", it was discovered that over 50 % of the companies involved in the study did not have these significant words displayed on their homepages. The word "green" was found on nine of the thirty web site home pages, "sustainable" was found on six pages, "LEED" was found on five, and "environmental" was only found on four homepages. Figure 1 displays the number of company's having different number of significant and hyperlinked words on their homepage.

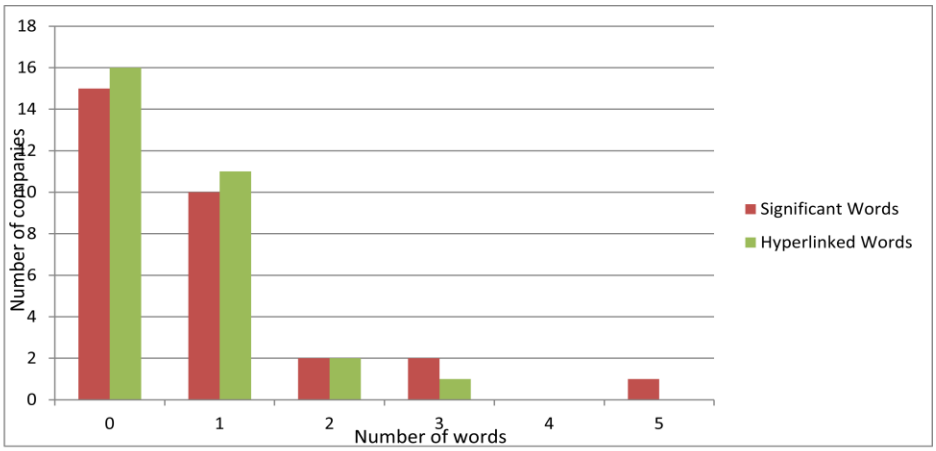

Figure 1: Homepage significant and hyperlinked words

The majority of the company's did not have any significant or hyperlinked words on their homepage. Only one company's home page contained all four of the significant words, and the word "environmental" was found twice. The average number of significant words for the websites was found to be less than one. The average number of hyperlinked words found was even less.

Section 2

The Content Matrix in section two was broken down into three parts. Part one dealt with the discovery of keywords on company web pages. The results from section two, part one are found in *Figure 2*.

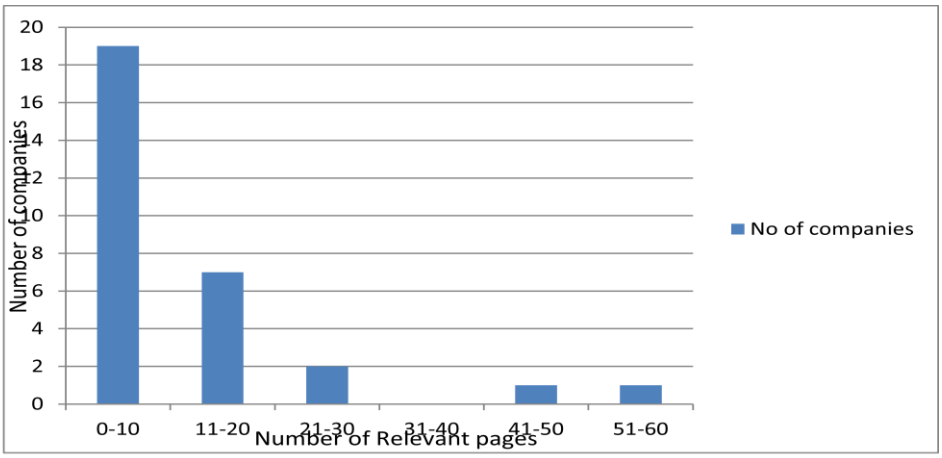

Figure 2: Website relevant pages

The average number of relevant pages found on a website was 10.77. Three of the companies' websites in the study contained no relevant pages for them to reach prospective clients. On average a company had the acronym "LEED" more than the word "green" or "sustainable/sustainability" or "Environmental"

Part two of section two dealt with the type of information found on the relevant web pages. These results are given in *Figure 3*. The majority of the information found on the pages in the study was case study information with 171 case study pages all together. Only one page found in the study was a client testimonial.

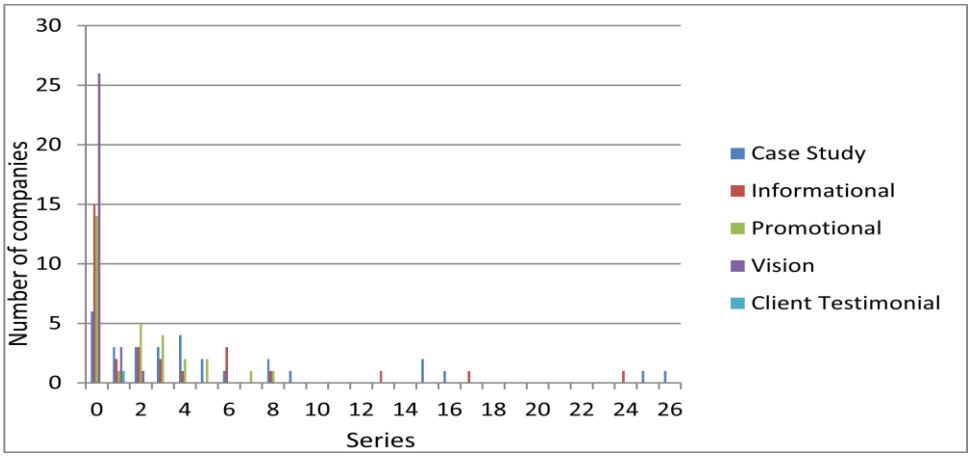

Figure 3: Web page description categories

The results of part three of section two can be found in *Figure 4*. The overall average level that a relevant page was found was 2.84. Three web pages made their information very accessible, on average this information was found on a second level. This means that visitors only navigated two levels away from the homepage in order to view this information.

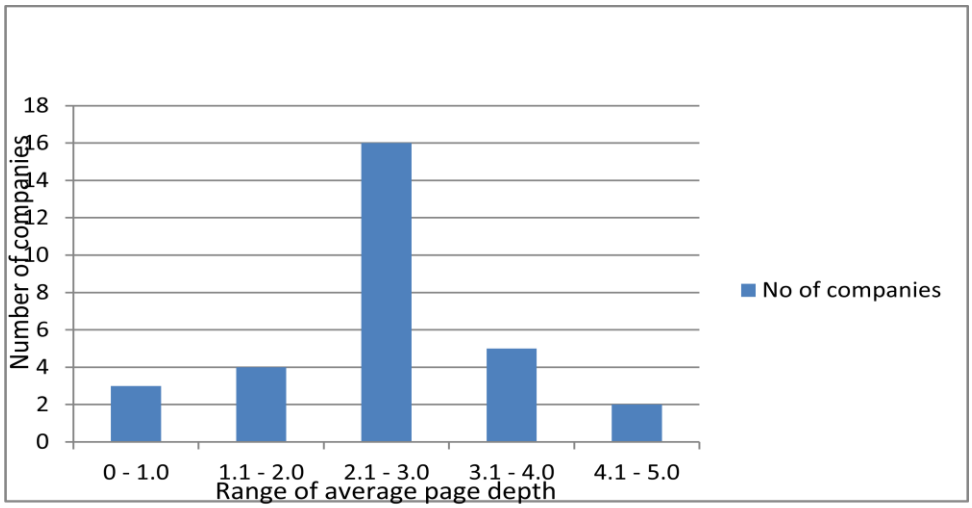

Figure 4: Average page depth chart

ENR Top Green Contractors Comparison

In September of 2008 the ENR produced the Top 100 Green Contractors. This ranking is based on the volume of projects the companies have worked on, in which sustainable building practices were used. The results found in this study were compared to the list of ENR Top Green Contractors. For this comparison, the results of section one and two is used.

In section one, individual companies received one point each time one of the significant words appeared on its homepage and one point for each of the words that were hyperlinked. In section two, individual companies received a point for each significant word that was used appropriately on a web page of the company's web site. Points were also given to each of the companies based on the average level these words were found on. An average level of 2 to 2.49 received six points, an average level of 2.5 – 2.99 received 5 points, and so on. The points from both sections were totaled for the company's overall grade. The company with the most points ranked the highest. Table 1 displays the number of points each company received as well as their ranking in this study.

Table 1

Study Rankings

Company	Point Total	Ranking
J	139.00	1
G	117.00	2
b	65.00	3
L	62.00	4
P	54.00	5
O	45.00	6
D	42.00	7
C	41.00	8
K	38.00	9
F	37.00	10
B	34.00	11
S	30.00	12
A	27.00	13
I	26.00	14
N	25.00	14
E	24.00	16
V	20.00	17
Y	18.00	18
M	16.00	19
Q	16.00	19
Z	16.00	19
T	14.00	22
U	12.00	23
d	8.00	24
H	7.00	25
W	6.00	26
c	6.00	26
a	1.00	28
R	0.00	29
X	0.00	29

The top five companies' rankings in this study were compared to their ranking in the ENR Top Green Contractors List. Table 2 displays each company and their ranking in each list.

Table 2

Compared Rankings

Company	ENR Top Contractors Ranking	ENR Top Green Contactors Ranking	Study Ranking	ENR Top Green Contactors Grade	Study Grade
A	3	1	13	100	52
B	6	3	11	96	60
C	7	4	8	95	72
D	13	7	7	92	76
E	18	N/A	15	0	44
F	20	45	10	54	64
G	31	2	2	97	96
H	32	76	7	23	76
I	33	11	14	88	48
J	36	28	1	71	100
K	38	18	9	81	68
L	45	33	4	66	88
M	46	N/A	18	0	32
N	47	20	14	79	48
O	51	N/A	6	0	80
P	54	54	5	45	84
Q	65	N/A	18	0	32
R	82	19	25	80	4
S	83	10	12	89	56
T	86	N/A	19	0	28
U	91	N/A	20	0	24
V	92	39	16	60	40
W	94	21	23	78	12
X	99	24	25	75	4
Y	105	N/A	17	0	36
Z	109	30	18	69	32
a	110	N/A	24	0	8
b	125	N/A	3	0	92
c	140	N/A	23	0	12
d	143	22	21	77	20

Only one company was ranked in the top five of both the ENR Top 100 Green Contractors list and this study. That was company G; it placed second in both of the rankings. A company, which ranked fifth on the ENR Top Green Contractors, was not used in this study because the company's website did not contain a search engine. The company that ranked third in this study was not even listed on the ENR list of Top Green Contactors. If a company has an "N/A" appearing under their green contractors ranking, it was not listed in the ENR Top Green Contractors. Many of the companies have similar rankings but dissimilar grades.

Conclusions

It might be expected that companies appearing on the ENR Top Green Contractors list would market their green building practices on their website. However, that was not the case. It was found that there was little connection between the two. The results in section one imply that the presence of words discussing green building practices on a company's website somewhat indicate the amount of green work the company is doing. The top five companies on the ENR Top Contractors list had at least one hyperlinked significant word on their homepage. Companies with a greater amount of these significant hyperlinked words on their homepage, however, do not necessarily do more green work.

The outcome of section two implies there is a weak relationship between the quantity of pages containing the significant words in this study and the amount of sustainable building they perform. The companies ranking first, second, and fourth on the ENR Top Contractors ranking had less than 15 pages depicting their interest in green building. This observation indicates that companies doing green work are not discussing this work on their websites. Within the content that did exist, the most common type of information found pertaining to green building practices was case study information. This is not surprising fact but displaying their product is an excellent way for companies to show their capabilities. On average the green building information did not require navigating very far away from the homepage, which is favorable. Even still, a few companies had this information buried.

While the results may suggest little or no relationship between the quantity of content on the websites and the amount of green projects the company produces, there was a connection between the mention of such practices on a company's website and the amount of work they perform utilizing those practices. While the mere mention of these practices on a website might not equate to a top ten ranking on the ENR Top Green Contractors list, 95 percent of the companies that appeared both in this study and the ENR Top 100 Green Contractors list did have at least one page on their website that mentioned green building practices. Therefore, it is important to refer to these practices on a website, however minimal the reference might be. The mention of these practices on a homepage is an even stronger link to a company's success in this field. Marketing for very large companies might not be as important; their popularity and success on thousands of projects across the United States and the world, as well as, a brief mention of their sustainable building practices could be all the marketing they need. On the other hand, smaller companies, wanting to grow and increase their green building projects, should nevertheless do their best to provide content on their websites that back up their practices. They might find that doing so increases their workload in that area, it is very doubtful that it would hurt their prospects. Company G, for example, is ranked number 31 on the ENR Top 400 Contractors List, proving it is not a huge company like company A and company B. company G, however, did a great deal of advertising in regards to their green building practices on their website and earned the number two ranking on the ENR Top 100 Green Contractors List.

It should be said that not ranking high in this study does not indicate that a company is not green, it just indicates that they are not marketing their green practices on their website as well as they could be. Companies who appear on the ENR Top Green Contractors list are obviously doing green work, yet they do not advertise this work to potential customers exploring their website. A company's homepage is the first impression an individual gets when visiting a website. If green

building practices are an important part of a company, they need to be acknowledged here. Further information discussing these practices should exist on a website. Companies ought to back up the practices they advertise on their homepage, and this information should be easily accessible. It should be located close to the homepage, requiring very little navigation away from that page. Companies should not make future clientele dig for this information. Another way to make information accessible is by providing a search engine. It should also be mentioned that many companies without search engines do a great deal of green work. That is to say, companies not chosen for this study because their website did not contain a search engine, may in fact build a large quantity of green buildings. However, the presence of a search engine makes accessing sustainable information fairly simple and thus, should be used on a website. The information found most often on a webpage was case study information, while this is important, other types of information such as client testimonials should also be used to draw in clients. These companies have a marketing tool in place, their website. They should be using it to better market their green building practices.

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