University of Massachusetts Amherst
ScholarWorks@UMass Amherst

Jul 31st, 10:15 AM - 11:15 AM

Finding Destinations in Search Engine Results

Florian Zach
Temple University, fzach@temple.edu

Wesley S. Roehl
Temple University, wroehl@temple.edu

Florian Zach
National Laboratory for Tourism & *e*Commerce
School of Tourism and Hospitality Management
Temple University
Philadelphia, PA 19122, USA

and

Wesley S. Roehl
School of Tourism and Hospitality Management
Temple University
Philadelphia, PA 19122, USA

ABSTRACT

It is generally understood that information about products and services is essential in creating consumers' perceptions and expectations towards tourism experiences. One of the channels potential tourists rely on is word-of-mouth, whose importance increased sharply since the rise of websites that allow tourists to share their experiences (consumer generated content). In this study we explore this issue by examining the prominence of one type of user generated content, Wikipedia, in destination search results. It was found that Wikipedia articles appear near the top of the list of retrieved results in nearly all of the top search engines. Implications are made regarding the use of Wikipedia articles to promote the destination.

Key Words: Wikipedia, word-of-mouth, Destination marketing organizations

INTRODUCTION

Often referred to as the lifeblood for the tourism industry, information is central to the marketing of tourism destinations (Poon, 1993). The Internet has become one of most important sources for travel information and has irrevocably changed the nature of how tourism organizations provide information (Buhalis, 1998, 2000; Hwang and Fesenmaier, 2004; TIA, 2005; Wang and Fesenmaier, 2006). In Web1.0 websites were static and simply provided information. Today, Web2.0 makes full use of the bidirectionality of the Internet, encouraging Internet users to add content to websites and to comment on products, services and experiences. The Internet became home to large-scale word-of-mouth communities (Dellarocas, 2003), whose existence complicates the efforts of destination marketing organizations (DMOs) to manage on-line content about their destination. Essentially every DMO in the United States has a website to provide tourism relevant information (Zach, Xiang and Fesenmaier, 2007). However, the on-line information environment is complex; DMO websites are not always listed on the top of search results in generic search engines and DMO websites compete for attention with content on publicly created websites (Guernsey, 2000).

Information technology and word-of-mouth

Destination marketing organizations have long recognized that they work in a complex information environment. Gunn (1988), for example, noted that while some information is directly under the control of the DMO much of the information a potential visitor may access is, at best, only partially under the control of destination marketers. This challenge is even more prevalent today. DMOs make use of the Internet and its interactive capabilities to attract, engage, retain, and learn about visitors (Buhalis 2000; Gretzel et al. 2000; Werthner & Klein 1999). However, limited budgets and a limited understanding of the Internet constrain DMOs from fully exploiting the advantages of the Internet (Gretzel, Fesenmaier, Formica & O'Leary 2006; Yuan, Gretzel & Fesenmaier 2003, 2006). Furthermore today's Internet users frequently refer to websites other than those managed by DMOs to gather further information about the product or service of their desire (Guernsey, 2000).

One strategy that has been suggested to better influence destination-specific information search by consumers is the development of domain specific search engines. These programs, hosted by DMOs, would provide information exclusively about a certain destination or set of destinations (e.g. Wöber, 2006; Xiang and Fesenmaier,

2006). Others have identified the need to evaluate and improve DMO websites to retain visitors and gain a
competitive advantage within the industry (Cronin, 2003). However, the underlying assumption of these studies is that Internet users find and use the intended (DMO) website. Practice, however, shows that generic search engines are still the most frequently used tool when searching for information online. Drawing on the importance of the Internet as a primary source of travel information, this study evaluates the placement of official DMO websites and user-generated websites when searching for destination information on popular generic search engines.

Word-of-mouth outperforms marketing efforts in their impact on product judgments and attitude formation (Anderson, 1998; Herr, Kardes and Kim, 1991). Similarly, past tourism research identified the importance of word-of-mouth through family and friends as a marketing channel for the tourism industry (Fesenmaier and Vogt, 1993). With the rise of the Internet word-of-mouth has migrated to the electronic world which allows easier access to, and simplifies the provision of, information by anybody in the form of discussion boards, forums, blogs and also online encyclopedias (e.g. Aschoff, Prestipino and Schwabe, 2007; Dellarocas, Awad and Zhang, 2005; Dellarocas, 2003; Pan, MacLaurin and Crotts, 2007). Thus, it is important to understand that the Internet, especially consumer generated content, can affect the reputation and ultimately visitor's perception of destinations. On the other hand, DMOs can use those websites for their advantage by purposefully adding favorable comments about their destination. This becomes valuable since consumers have high levels of confidence with information gathered from word-of-mouth sources, i.e. it is perceived as credible, as the people handing this information over have no self-interest in pushing a product or service (e.g. Silverman, 1997). For the tourism industry it was found that information provided by online communities is at least as timely as information in guidebooks (Prestipino, Aschoff and Schwabe, 2007). This study furthermore evaluated the quality of the information of user-generated content on the most prominently ranked online community website, the Wikipedia project.

Wikipedia

The Wikipedia website was launched in 2001. It contains more than 2.8 million articles in its English version and more than 10 million articles in total as of April 2009 (Wikipedia:About, 2009). Even though Wikipedia is community-based, i.e. anyone who creates a user account can manipulate (add, edit and delete) articles, a number of studies assert that Wikipedia articles are of high quality. Wilkinson and Huberman (2007) found that the quality of the articles on Wikipedia increased with increases in the number of editors and edits of an article. They successfully distinguished between "featured articles" (i.e. articles that are, according to Wikipedia editors' opinion, considered the best on the Wikipedia website) (Wikipedia:Featured_articles, 2007) and random articles. A comparison with the Google PageRank as a measure of the importance of websites (Brin and Page, 1998) showed that articles with a higher quality also have a higher (more favorable) PageRank. The distinction between featured and random articles was based on the ratio of the total number of editors (a measure of diversity) to the total number of edits (a measure of rigor) (Stvilia, Twidale, Gasser and Smith, 2005). Using the same measure, Lih (2004) showed that the quality of Wikipedia articles increased once they have been cited in the press. Additionally it was found that the language used for Wikipedia articles was as formal as the language used in the *Columbia Encyclopedia* (Emigh and Herring, 2005). These studies suggest that Wikipedia's content is at a quality level comparable to traditional encyclopedias.

However, the high level of quality and the vast and growing number of articles are not the only reasons that Wikipedia should catch DMO managers' attention. A recent study showed that Wikipedia articles on brand names are often prominently presented in the results (that is, in the language of search engines, ranked highly) of searches on generic search engines (Rubel, 2006). Since a destination can be considered similar to a brand this raises questions about the performance of DMO web sites versus Wikipedia articles in the results retrieved by generic search engines. In fact, there is another reason to suspect that Wikipedia results may be prominent in destination searches. Bellomi and Bonato (2005) conducted a network analysis on the link structure of Wikipedia and found that due to the inherent structure of Wikipedia, the most prominent articles are those about geographic locations. These authors also demonstrated that Wikipedia content over-represented articles on Western culture. This tourism-favorable bias of Wikipedia articles together with the prominent positioning of Wikipedia articles in search engines and the potential for DMO managers to monitor and perhaps manipulate their content makes understanding Wikipedia's role in destination-specific searches a critical issue.

METHOD

The current study focused on evaluating the prominence and quality of Wikipedia articles on the top five tourism destinations in the United States in the summer of 2007. According to American Society of Travel Agents (ASTA), the five domestic destinations most often booked by travel agents were Orlando (21.0%), Las Vegas (19.1%), New York City (11.8%), Honolulu (8.6%) and San Francisco (4.6%) (ASTA, 2007). For the purpose of this study the log files of the corresponding Wikipedia articles were downloaded on October 10th, 2007. This data includes information on every change (edit) that was made to the Wikipedia article. Analysis focused on data of change and user (editor). Following previous studies the quality of the Wikipedia articles was evaluated using the editor/edits ratio whereby all edits (minor and others) were included (Stvilia et al., 2005). Additionally, for each of the five destinations we identified the rank of the destination-specific Wikipedia articles and the rank of the official DMO website in searches conducted using the top five search engines in the United States. See Table 1 for the list of URLs for the official, DMO sponsored websites and the corresponding Wikipedia article for each of the destinations. Based on their share of searches for August 2007 the top five generic search engines were: Google (53.6% share of searches), Yahoo (19.9%), MSN/Live (12.9%), AOL (5.6%) and Ask (1.7%) (Bausch, 2007). Finally, multivariate analysis was conducted to test the importance of three determinants in understanding the rank of the retrieved pages: whether the retrieved page was the official DMO websites or the Wikipedia article, the destination, and the search engine.

Table 1. Official websites and Wikipedia articles of the top five US tourism destinations ranked by their popularity of bookings in 2007 (ASTA, 2007)

	Official Website	**Wikipedia article**
Orlando	http://www.orlandoinfo.com/	http://en.wikipedia.org/wiki/Orlando,_Florida
Las Vegas	http://www.visitlasvegas.com/	http://en.wikipedia.org/wiki/Las_Vegas,_Nevada
New York City	http://www.nycvisit.com/	http://en.wikipedia.org/wiki/New_York_City
Honolulu	http://www.honolulu.gov/ http://www.co.honolulu.hi.us/	http://en.wikipedia.org/wiki/Honolulu,_Hawaii
San Francisco	http://www.onlyinsanfrancisco.com/ http://www.sfvisitor.org	http://en.wikipedia.org/wiki/San_Francisco

RESULTS

It was found that the Wikipedia articles for four of the destinations were created in 2002. The Wikipedia entry on New York City was created in 2001. Table 2 shows the ratio of editors by edits for each year of existence of an article. As identified by Stvilia et al. (2005) a ratio close to 0.40 (in their study attributed to featured articles) indicates a high quality of the Wikipedia article. Overall, the 31 observations have a mean content quality of 0.50 while the median quality measure is 0.48. Quality appears to improve over time as the content quality ratio declines. At the same time the variability in quality (as measured by the standard deviations) among the destination-specific Wikipedia entries also declines. Graphically this is shown in Figure 1. Most noticeable is the downwards peak for New York City in 2003. This may be a consequence of the prominence of New York City following the terror attacks of 9/11 and delayed updating of related topics as more details have been revealed. Overall, it seems that across all destinations but Honolulu the quality of the articles seems to converge.

Table 2. Editor/edits ratio for the Wikipedia articles of the top five US tourism destinations ranked by their popularity of bookings in 2007 (ASTA, 2007)

	2001	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Orlando		1.00	0.80	0.59	0.48	0.50	0.49
Las Vegas		0.59	0.65	0.50	0.35	0.46	0.48
New York City	0.50	0.32	0.15	0.30	0.38	0.39	0.42
Honolulu		0.67	0.53	0.28	0.51	0.62	0.63
San Francisco		0.56	0.48	0.48	0.47	0.30	0.45
Year mean	0.50	0.63	0.52	0.43	0.44	0.45	0.49
Year standard deviation	-----	0.25	0.24	0.13	0.07	0.12	0.08

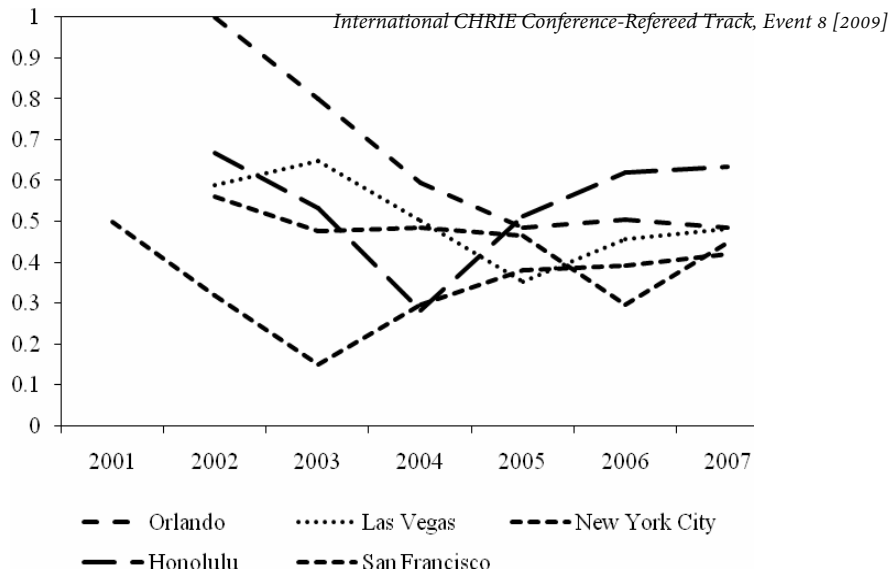*International CHRIE Conference-Refereed Track, Event 8 [2009]*

Figure 1. Editor/edits ratio for the selected Wikipedia article with the benchmark range from 0.4 to 0.7 as identified by Stvilia et al. (2005)

Turning to the comparative rankings in search results of the DMO generated web site and the corresponding Wikipedia articles (Table 3) both sites tended to appear prominently in Google and AOL searches. However, the AOL search is "powered by Google" and consequently delivers the same search results. Considering the comparative ranking of the DMO websites and Wikipedia articles across search engines the DMO websites and the Wikipedia articles performed best in searches for Honolulu and San Francisco and worst in searches for Las Vegas. Interestingly in some cases (Las Vegas and San Francisco) the ranking of search results on MSN Live is actually the lowest. This indicates that the MSN Live search algorithms value different aspects of a website than the other search engines. While links to the Wikipedia articles have a lower rank on Ask.com, this search engine dedicates a special section for Wikipedia articles (titled Wikipedia Encyclopedia) on the first page of the search results. This Wikipedia encyclopedia entry even includes the first few lines of the article.

Comparing the ranking of DMO websites and Wikipedia against each other we see that the DMO websites consistently appeared in a more prominent position. The mean position of DMO websites across the five destinations and five search engines was 3.1 while the mean position of the corresponding Wikipedia article was 7.0. Only in the case of Las Vegas when searched on Ask.com was the official website ranked lower than the Wikipedia article. Both typically appear on the first page of retrieved results. Furthermore, analysis of variance (ANOVA) identified three main effects explaining the ranking of the search results: destination (F = 3.207, p = 0.026), search engine (F = 3.852, p = 0.019) and the distinction between DMO websites and Wikipedia articles (F = 5.408, p = 0.027). Two way interactions of these factors were explored, but were found to not be statistically significant. The position of search results depends on the destination being searched, the search engine used, and whether one is focused on the official DMO website or the Wikipedia article. A main effect for destination means that the position of the official DMO website and of the Wikipedia article in search results varies by destination. These types of pages appear higher or lower in the search results depending on which destination was searched. Similarly different search engines produce a different order of results and the main effect for the DMO vs. Wikipedia distinction means that these two types of pages appear on different places in the search results. All of these statistically significant main effects raise questions about our ability to generalize from one destination to another. Different destinations searched for on different search engines produce different results—regardless of whether the focus is the DMO page or the Wikipedia article.

Table 3. Rank of links to the selected Wikipedia articles (A) and the official DMO websites (B) (destinations ranked by their popularity of bookings in 2007; search engines ranked by their market share in August 2007)

	Orlando		Las Vegas		New York City		Honolulu		San Francisco		A			B		
	A	B	A	B	A	B	A	B	A	B	Med	Mean	StDv	Med	Mean	StDv
Google	3	1	6	2	2	1	2	1	2	1	2	3	1.7	1	1.2	0.4
Yahoo	6	1	11	3	6	2	2	1	2	2	6	5.4	3.7	2	1.8	0.8
MSN/Windows Live	12	1	17	6	9	1	4	1	18	2	12	12	5.8	1	2.2	2.2
AOL	3	1	6	2	2	1	2	1	2	1	2	3	1.7	1	1.2	0.4
Ask.com	14	1	14	41	11	1	10	1	10	2	11	11.8	2.0	1	9.2	17.8
Median	6	1	11	3	6	1	2	1	2	2						
Mean	7.60	1.00	10.80	10.80	6.00	1.20	4.00	1.00	6.80	1.60						
Standard Deviation	5.13	0.00	4.87	16.96	4.06	0.45	3.46	0.00	7.16	0.55						

CONCLUSIONS

Before summarizing the results it is important to comment on this study's limitations. Even though we feel that the results reflect the importance of Wikipedia articles about tourism destinations, it has to be noted that we chose the most prominent destinations for this exploratory study. Also, we limited our study to the English version of the Wikipedia. As such, results might be different for less popular destinations and Wikipedia articles in different languages.

The results of this study support the findings made by Stvilia et al. (2005) that Wikipedia articles are often of high quality as measured by the editor/edits ratio. They also rank high among search engine results. This makes Wikipedia an important source of destination information. While Wikipedia articles are prominently placed in most searches they do not appear above the DMO-generated content, which is good news for DMO managers in their attempt to shape the image of their brands. The open-access nature of Wikipedia offers opportunities for DMO managers. DMOs can use Wikipedia as an additional communication channel for potential visitors. Even if constrained by limited budgets DMOs can exploit Wikipedia as the cost of manipulating an article is essentially zero (except the opportunity costs of the time used for manipulating the article). However, new programs on the Internet allow users to identify who changed what on the Wikipedia (http://wikiscanner.virgil.gr). Hence, the cost of being caught and outed can be high when manipulations are done carelessly (e.g. Fields, 2007; Hafner, 2007). In order to use Wikipedia diligently DMOs have be careful with the number of edits and the location from which these entries are conducted. Overall, our findings advocate the purposeful manipulation of Wikipedia to provide accurate and tourism-advantageous information. Ultimately, carefully updating and extending the Wikipedia article DMOs can leverage a word of mouth supporting DMOs' visions.

REFERENCES

Anderson, E. W. (1998). Customer satisfaction and word of mouth, *Journal of Service Research*, 1 (1), 5-17.

ASTA. (2007, February 26). ASTA announces results for 2007 summer hot spots survey. Retrieved October 10, 2007 from ://www.astanet.com/news/releasearchive07/022607.asp.

Bausch, S. (2007, September 19). Nielsen//Netratings announces August U.S. search share rankings. Retrieved October 10, 2007 from: (http://www.netratings.com/pr/pr_070919.pdf.

Bellomi, F., & Bonato, R. (2005). Network analysis for Wikipedia . *Proceedings of Wikimania 2005—The First International Wikimedia Conference*. Frankfurt, Germany. Retrieved October 10th, 2007 from http://www.fran.it/articles/wikimania_bellomi_bonato.pdf.

Brin, S., & Page, L. (1998). The anatomy of a large-scale hypertextual web search engine, *Computer Networks and ISDN Systems*, 30 (1-7), 107-117.

Brown, J., Broderick, A. J., & Lee, N. (2007). Word of mouth communication within online communities: conceptualizing the online social network. *Journal of Interactive Marketing*, 21 (3), 2-20.

Buhalis, D. (1998). Strategic use of information technologies in the tourism industry. *Tourism Management*, 19(5), 409-421.

Buhalis, D. (2000). Marketing the competitive destination of the future. *Tourism Management*, 21(1), 97-116.

Cronin, J. J. (2002). Looking back to see forward in service marketing: some ideas to consider. *Managing Service Quality*, 13 (5), 332-337.

Dellarocas, C. (2003). The digitization of word-of-mouth: promise and challenges of online reputation mechanisms. *Management Science*, 49 (10), 1407-1424.

Dellarocas, C., Awad, N., & Zhang, M. (2005). Using online ratings as a proxy of word-of-mouth in motion picture revenue forecasting. *Working paper*, Smith School of Business, University of Maryland.

Emingh, W., & Herring, S. (2005). Collaborative authoring on the web: a genre analysis of online encyclopedias. In *Proceedings of the 39th Hawaii International Conference on System Sciences*.

Fesenmaier, D. R., & Vogt, C. A. (1993). Evaluating the utility of touristic information sources for planning Midwest vacation travel. *Journal of Travel & Tourism Marketing,* 1 (2), 1-18.

Fields, J. (2007, August 15). Wikipedia "shows CIA page edits". Retrieved September 19, 2007 from http://news.bbc.co.uk/2/hi/technology/6947532.stm.

Gretzel, U., Fesenmaier, D. R., Formica, S. , & O'Leary, J. T. (2006). Searching for the future: challenges faced by destination marketing organizations. *Journal of Travel Research*, 45 (2), 116-126.

Guernsey, L. (2000). Suddenly, everybody's an expert on everything. *The New York Times* (February 3), G1.

Gunn, C. (1988). *Tourism Planning*. New York, NY: Taylor & Francis.

Hafner, K. (2007, August 19). Seeing corporate fingerprints in Wikipedia edits. Retrieved September 19, 2007 from http://www.nytimes.com/2007/08/19/technology/19wikipedia.html.

Herr, P. M., Kardes, F. R., & Kim, J. (1991). Effects of word-of-mouth and product-attribute information on persuasion: an accessibility-diagnosticity perspective. *The Journal of Consumer Research*, 17 (4), 454-462.

Hwang, Y.-H., & Fesenmaier, D. R. (2004). Coverage error embedded in self-selected Internet-based samples: a case study of Northern Indiana, *Journal of Travel Research,* 42 (3), 297-304.

Lih, A. (2004). Wikipedia as participatory journalism: reliable sources? Metrics for evaluating collaborative media as a news resource. In *Proceedings of 5th International Symposium on Online Journalism*, Austin, TX.

Poon, A. (1993). *Tourism, technology and competitive strategies*. Wallingford, CT: CAB International.

Prestipino, M., Aschoff, F.-R., & Schwabe, G. (2007). How up-to-date are online tourism communities? An empirical evaluation of commercial and non-commercial information quality. In *Proceedings of the 40th Annual Hawaii International Conference on System Sciences (HICSS'07)*.

Rubel, S. (2006). Your brand on Wikipedia. *Advertising Age*, 77 (37), 39, 2/5p, 2c (September 11th)

Silverman, G. (1997). How to harness the awesome power of word of mouth. *Direct Marketing*, 60 (7), 32-37.

Stvilia, B., Twidale, M. B., Gasser, L., & Smith, L. C. (2005). Information quality in a community-based encyclopedia. In: S. Hawamdeh (Ed.), *Knowledge Management: Nurturing Culture, Innovation, and Technology - Proceedings of the 2005 International Conference on Knowledge Management*. (pp. 101-113). Charlotte, NC: World Scientific Publishing Company.

Travel Industry Association of America (2005). *Travelers' Use of the Internet*. Washington, DC: Travel Industry Association of America.

Wang, Y., & Fesenmaier, D. R. (2006). Identifying the success factors of web-based marketing strategy: an investigation of convention and visitors bureaus in the United States. *Journal of Travel Research*, 44(3), 239-249.

Werthner, H., & Klein, S. (1999). *Information Technology and Tourism - A Challenging Relationship*. Wien - New York: Springer-Verlag.

Wikipedia:About. (2007, October 10). Wikipedia: About. Retrieved October 10, 2007 from http://en.wikipedia.org/wiki/Wikipedia:About

Wikipedia:Featured_articles (2007, October 9). Wikipedia: Featured articles. Retrieved October 10, 2007 from http://en.wikipedia.org/wiki/Wikipedia:Featured_articles.

Wilkinson, D. M., & Huberman, B. A. (2007). Assessing the value of cooperation in Wikipedia. Eprint arXiv:cs/0702140, February (http://arxiv.org/PS_cache/cs/pdf/0702/0702140v1.pdf).

Wöber, K. W. (2003). Evaluation of DMO web sites through interregional tourism portals: a European cities tourism case example. In: A. Frew, M. Hitz., & P. O'Connor (Eds.), *Information and Communication Technologies in Tourism* (pp. 212-221). Vienna, Austria: Springer Verlag.

Wöber, K. W. (2006). Domain specific search engines. In D. R. Fesnmaier, K. Wöber & H. Werthner (Eds.), *Destination Recommendation Systems: Behavioral Foundations and Applications.* Wallingford, UK: CABI.

Xiang, Z., & Fesenmaier, D. R. (2006). Assessing the initial step in the persuasion process: Meta tags on destination marketing websites. *Information Technology & Tourism,* 8 (2), 91-104.

Yuan, Y., and D. R. Fesenmaier (2000). Preparing for the new economy: the use of the Internet and intranet in American convention and visitor bureaus." *Information Technology and Tourism*, 3 (2), 71-86.

Yuan, Y., Gretzel, U., & Fesenmaier, D. R (2003). Internet technology use by American convention and visitors bureaus. *Journal of Travel Research,* 41 (3), 240-255.

Zach, F., Xiang, Z., & Fesenmaier, D. R. (2007). An assessment of innovation in web marketing: investigating American convention and visitors bureaus, In Sigala, M., Mich, L., & Murphy, J. (Eds.), *Information and Communication Technologies in Tourism* (pp. 365-376). Vienna, Austria: Springer Verlag.