

**ACCOMMODATION SEARCH QUERY FORMULATION: IMPLICATIONS  
FOR SEARCH ENGINE MARKETING**

Bing Pan\*

Department of Hospitality and Tourism Management  
School of Business and Economics  
College of Charleston  
66 George Street  
Charleston, SC 29424  
Phone: 001-843-953-2025  
Fax: 001-843-953-7317  
Email: [panb@cofc.edu](mailto:panb@cofc.edu)

Stephen W. Litvin

Department of Hospitality and Tourism Management  
School of Business and Economics  
College of Charleston  
66 George Street  
Charleston, SC 29424  
Phone: 001-843-953-7317  
Fax: 001-843-953-7317  
Email: [litvins@cofc.edu](mailto:litvins@cofc.edu)

Tom O'Donnell

Department of Hospitality and Tourism Management  
School of Business and Economics  
College of Charleston  
66 George Street  
Charleston, SC 29424  
Email: [ODonnellt@cofc.edu](mailto:ODonnellt@cofc.edu)

\* Corresponding Author

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### ***ABSTRACT***

*The breadth and depth of online information affords a traveler an enormous amount of choices of potential destinations and accommodations. One of the key tools travelers rely upon to find information of value is search engines. As such, accommodation marketers, the primary target beneficiary of this research, would be well served by a greater understanding as to how travelers perform their searches within the search engine environment and of the types of keywords they use to navigate that search. Such knowledge would better inform their online marketing campaigns, and thus allow for more effective use of their limited marketing dollars. This study analyzed 701 Excite.com user queries of accommodation searches in order to identify trends of query formulation. Four types of analysis were conducted: types of query keywords; types of whole queries; sequence of query formulations; and associations of keyword types. The results suggest that travelers most often search for their accommodations simultaneously with their search for other aspects of their travel, such as destinations, attractions, transportations, and dining; and that they most often commence their search seeking specific hotels in conjunction with the city they are considering for a visit. A sequential analysis also revealed that many users engage in a switching behavior that swings between a broad and focused research tact. The marketing implications of these findings are discussed.*

**KEYWORDS:** search engine, search engine marketing, travel search, query formulation, accommodation search.

# **QUERIES FORMULATION IN ACCOMMODATION SEARCHES AND THE IMPLICATION FOR SEARCH ENGINE MARKETING**

## **INTRODUCTION**

The number of potential travelers that log on the web for travel-related information and tourism products continues to grow and this growth shows no signs of slowing down. Per Milligan (2006), in 2005 75% of online American travel planners booked or made travel reservations on the Internet and the dollar value of online bookings surpassed all other booking methods, to include phone reservations and through travel agents. The growing dominance of the Internet as a hospitality and tourism marketing tool has led to a concurrent explosion of study of its impact. This paper adds to our understanding by focusing on the important issue of online searches, providing hotel marketers a better understanding of the Internet purchase behaviors of their potential guests.

The significant majority of online travel searches utilize a search engine as the initial point of entry. Per Donoghue (2006), 70% of all online bookings funnel through a search engine as the user seeks to locate information to assist in travel planning. Given this dramatic percentage, it is important that strategies be employed by travel providers to ensure that a user's search engine query results prominently display their product. The new field of Search Engine Marketing (SEM), involving "a set of marketing methods to increase the visibility of a website in search engine results pages" (Wikipedia, 2006) has emerged to assist marketers to accomplish this goal. SEM success depends upon the placement of the appropriate keywords on a businesses' website, such that these mirror the word choice of potential travelers during their search. Getting these keywords right leads to one's website securing a prominent position on the search engine results pages; while the wrong keywords or combination of keywords virtually assures that the potential visitor never finds his/her way to the web page, no matter how perfect a fit the destination, hotel, etc. may be to the traveler's needs. Further, many businesses, understanding the critical importance of capturing the attention of potential guests, purchase keywords through a bidding process such as Google AdWords (Google, 2006)

to provide enhanced placement in the search output. These must be the right fit to justify the additional expenses. But how does a travel provider know, beyond costly trial and error, tweaking, and guesswork (Beckwith, 2003), what keywords will work most effectively? This paper reports on research that has explored how travelers, their potential customers, perform travel searches within the search engine environment. In order to limit the scope of this research to a manageable task, the research has focused upon the search for accommodations, typically the first search made by a traveler once a destination has been decided upon, and often the largest single trip expenditure (Pan & Fesenmaier, 2006). Findings herein highlight the types of keywords travel searchers most often employ, and equally important the sequence of use of these keywords.

Travel information search related to decision making has been widely researched in tourism area. Past literature has shown that the traveler's search can be divided into internal and external search; the former is a scan of long-term memory for relevant product knowledge. The latter happens when internal search fails to provide satisfactory information and the traveler feels the need to continue the search (Bettman, 1979; Engel, Blackwell, & Miniard, 1990). Traditional marketing theory tells us that during their external search, potential travelers rely upon both marketing-dominated and non-marketing dominated information sources. The former includes mass media advertising and commercials, travel brochures, guidebooks, and welcome centers. The latter includes friends, relatives, perhaps a trusted travel agent, and personal experience. The Internet has become a source that bridges the gap between these two dimensions, with much of the information gleaned from one's surfing or searching blatantly marketing oriented, while much other content online is simply personal and informational.

Navigation of the path of exploration within the Internet environment, however, Pan and Fesenmaier (2000) have noted, has become a challenging journey as searchers are often overwhelmed by the huge amount of information at their fingertips and are frustrated at the difficulty they have attempting to locate the information they seek. Per these authors, and as noted in the statistics above, search engines have emerged as the essential tool to help travelers locate the most relevant information and to mitigate information overload.

There is much the provider can do to make the search easier for the searcher, or to at least make it easier to find their site – hopefully the perfect solution to their travel needs. Three key methods for increasing visibility are: search engine optimization, search engine advertising, and paid inclusion. These are described below:

- Search engine optimization involves adopting methods that improve the ranking of a website when a user types in relevant keywords in a search engine. These include creating an efficient website structure, providing appropriate web content, and managing inbound and outbound links to other sites.
- Search engine advertising refers to buying display positions at the paid listing area of a search engine. An example from Google AdWords is displayed as Figure 1.
- Paid inclusion involves paying search engine companies for inclusion of the site in their organic listings.

Of these three methods, search engine optimization is generally considered the most effective, as research has determined that searchers pay less attention to commercial content than they do to organic listings (Jansen & Resnick, 2005). Paid inclusion of search results will expedite the inclusion of a new website in a search engine's organic listings, but does not guarantee a higher ranking, and it has been found that searchers rarely view responses beyond the first result page in a listing, making low ranking listings of little value (Pass, Chowdhury, & Torgeson, 2006).

----- Insert Figure 1 here -----

Regardless of method selected, each requires a good understanding of the company's target market and the keywords that potential customers are likely to use in their searches. The research that follows analyzed the keywords that potential travelers used

during actual accommodation searches with the intent of answering the following two research questions:

- Did potential travelers search for their accommodations simultaneously with their destination, attractions, and restaurants, searches, or do these tend to be independent efforts?
- At what levels of geographical specificity were lodging searches generally conducted?

## **RESEARCH METHOD**

Excite (<http://www.excite.com>) was one of the earliest search engines available online (Gandal, 2001); and while all search engines have in recent years seen their market share eroded radically at the expense of Google's remarkable success, it remains a 2.3% search engine market share (Sullivan, 2006). The current study analyzed Excite 2001 transaction log data originally provided by the company to Dr. Amanda Spink of the University of Pittsburgh (Jansen, 2006), and now provided to the authors for additional study. While somewhat dated, this remarkably rich, and more importantly available dataset, has provide an interesting testing ground for researchers in recent years (for example Spink, Bateman, & Jansen, 1999, Spink, Jansen, Wolfram, & Saracevic, 2002, Ozmutlu, Spink, & Ozmultu, 2002, and Jansen, & Spink, in press). The Excite transaction log data contains the search keywords typed by users, as well as the time and sequence of entry of those keywords (see Table 1). The current study, an analysis of keywords and sequence of use of terms related to the lodging industry , provided valuable insight as we considered the aforementioned questions and should provide importance guidance to hoteliers' as they develop and refine their search engine marketing strategies.

The Excite dataset contains 1,025,910 query records, representing 594,940 unique queries. In this research, as suggested by Spink, Jansen, Wolfram, and Saracevic (2002), a search keyword has been defined as a string of characters with no space in between; the combination of keywords typed by a user is defined as a search query; and a user session

is a sequence of search queries in which the time between any two consecutive queries is less than one hour. Table 1 provides an example of a user search session.

----- Insert Table 1 here -----

To reduce the dataset to a manageable size, 3% of the unique queries were extracted from the database through random sampling, netting a sample of 17,804 unique queries. From these, a keyword search was used to eliminate all those that contained obviously pornographic keywords, resulting in 16,700 records available for testing. From these records, specific lodging related search sessions were culled using the keywords listed in Table 2. These keywords were a combination of generic accommodation keywords and the brand names of the most popular lodging companies worldwide. Any user session which contains at least one of these accommodation keywords was selected. The net result was a sample of 151 unique user sessions which collectively comprised 701 user queries. Analyses of these 701 queries are discussed below.

----- Insert Table 2 here -----

## **ANALYSIS**

### **Types of Query Keywords**

First analyzed were the specific types of query keywords used by searchers as they investigated their accommodation options. These are listed in Table 3 in rank order of usage. When reviewing Table 3, please note that while all captured user sessions incorporated a lodging search, not all queries within that session necessarily continued down with accommodation searches. Conversely, a session that began with a non-accommodation focused search may have ultimately led to a search for hotels. For example, a search that began with the search terms ‘Charleston and hotels’ for its initial inquiry, may have had as its second inquiry ‘Charleston and restaurants’, before returning to a third enquiry of ‘South Carolina and Embassy Suites.’ Coding of these three

inquiries would result in two usages for 'city', one for 'state', and one each for the terms 'hotel', 'hotel chain' and 'restaurant.' Table 3 thus adds to more than 100% as a function of the use of multiple keywords during the course of most search sessions.

As noted in Table 3, the most frequently used search term was the city of interest. Following the city were three different hotel search terms, followed by less specific geographic identifiers. Further down the list, one notes that specific attractions and activities, as well as hygiene information to include visa regulations, and weather information needed to make a trip successful, were also included in a fair number of search engine sessions. Also of note was the significant percentage of queries (9%) that used the simple keyword 'travel'.

When considering the rank order of the keywords, the generalization level of the searches is important. Perhaps unsurprisingly, a large majority of searches were at city versus county, state, or country level. Likewise, it is of note that the specific hotel was the most frequently used accommodation term utilized, which was included in more searches than either the hotel brand or the more generalized terms 'hotel' or the hotel type. Thus, even when the searcher knew the name of the hotel of interest, rather than finding another path to that property's website, they first went to Excite and entered the hotel's name as a means of directing them to the address. The same is true for brands. Even when some potential travelers knew he/she wished to visit say the Hyatt website, rather than simply guessing the obvious web address (hyatt.com) they instead went to Excite and typed in the word Hyatt, and then from the search results clicked on the Hyatt page.

----- Insert Table 3 here -----

### **Aanlyses on Whole Queries**

The two most common query types were the name of a specific hotel property (e.g. Renaissance Charleston Hotel; 14%), followed by searches for hotel brand names (e.g. Marriott; 11%). For brand searches, even if the potential traveler had a destination of

choice, the preferred trailhead was the corporate website, from which he/she would work their way to the property (e.g. they would use the search engine to locate the Marriott homepage, and once there either click along the path that takes them to the Renaissance Charleston's information or booking page). Interestingly, following these two search approaches, the next most often searched terms were those that identified the city of interest but added no additional search term other than the generic word 'hotel' (e.g. Charleston and hotel; 8%). This was followed by those focused searches that identified both their desired city and a pre-selected hotel (7%; Charleston and Renaissance Charleston Hotel).

Using Perl script language, the associations between different types of keywords in the same query were also determined. In this analysis, rather than looking specifically at the words used, combinations of words were studied. Table 4 reflects the counts and percentages of the most frequently found search word combinations with the accommodation keywords used by the searcher bolded (those combinations that occurred at least five times are listed).

The relationships of these associated keywords were plotted and depicted as Figure 2. In the figure, the node size represents the relevant keyword importance – as noted, city names were the most frequently used keyword used by searchers; thus city is shown to have the largest size. The thickness of the connecting lines between two nodes (keywords) indicates the strength of their association – for example, city and the name of a specific hotel were the most frequently paired keywords, so their connection line is thickest. As is therefore reflected in the figure, searches based upon 'city' have strong connections with searches of 'specific hotel', and 'hotel brand'; and have weaker connections with searches utilizing the keywords 'hotel' and 'hotel type'. And while the inverse is of course true that 'Specific hotel' and 'Hotel brand' searches had the strongest connection with searches at the 'city' level, the figure reflects their weaker connections with searches that employed keywords coded as 'state', 'country', and 'region'.

----- Insert Table 4 and Table 5 here -----

## **Sequence of Query Types**

Again using Perl script language, the switching behavior of a search sequence was determined. During this analysis, the sequence of search during the course of a single search session was considered. Searches were classified as falling within one of three categories: 'Zoom-in', 'Stay', and 'Zoom-out'. As example of a 'Zoom-in' search would be one during which the search session began with a query that utilized the search word 'hotel' or 'hotel brand', and then during the course of the search limited the search parameters to the name of a specific hotel. Another 'Zoom-in' example would be a search that started at the country or state level, with a subsequent query that searched at the city level. 'Zoom-out' searchers were, for example, those that began with the search term 'Marriott Courtyard' and then broadened the search to 'Marriott'. A search classified as 'Stay' did not deviate from the initial level of enquiry.

As reflected in Table 5, half of all searchers entered the search process with a specific geographic area selected and did not deviate from this choice. For example, if the potential traveler knew he/she wanted to come to Charleston, they would never zoomed out to look at the state as a whole. If they initially entered the search term 'South Carolina' they never returned to Excite to then enter 'Charleston', most likely finding the link they desired from the state-wide search results. The other half of searches, however, in equal proportion, either zoomed out from their initial query or zoomed in to a more defined choice. For hotels, the searches were less variable as two of three searchers 'stayed' within one level of search. These searchers likely either found what they were looking for with their initial level of inquiry, or went down a path from their initial search results that allowed them to ultimately find the information they were seeking (or simply gave up in frustration, which can certainly be the case).

## **DISCUSSION, SUGGESTIONS FOR PRACTICE, AND CONCLUSION**

Many of the above findings are of interest and importance to those marketing the accommodations sector. As was noted in Table 3, 25% of all search engine hotel queries used the name of a specific property. This suggests that a large number of searchers likely knew of the hotel before commencement of their search, perhaps either from the property's marketing efforts or the traveler's previous experience. Regardless of the genesis of this awareness, they knew of the place, and perhaps knew that where they wanted to stay, before using the search engine. This is good. But the inverse reminds us that 75% of searchers never used the search engine as a direct portal to the property (search for the name of the property directly). Speaking to hotel marketers... These 75% may have desired to stay at your property, your property may have been the perfect place for them to stay, but there is no way to ensure that they did not get detoured to a competitor along the way. The significance of the 75% number is that it reinforces the importance of effective Search Engine Marketing (SEM) and how critical the use of optimal keywords is to ensure that the fair share of these 75% find their way to your hotel's website.

Though likely not a surprise, it was of interest to note that the most prominent search term was 'city' (49%), i.e. the destination of interest. With half of all searches including this geographic level of generalization, hotel marketers would be wise to ensure that the city name be incorporated into their property name. For Charleston, this suggests that while the name of the deluxe property 'Wentworth Mansion' may be fine, that 'Wentworth Mansion of Charleston' would more effectively get displayed in search engine result pages. It also strongly suggests hotel brands would be wise to purchase the keyword combinations of the brand, say Hilton or Marriott, with different city and state names.

In addition, as discussed above, a large percent of users tend to switch to different geographic levels during the course of their search, that is they 'zoomed-out' to a broader area, or 'zoomed-in' to a more defined location. As such cross-marketing strategies across different levels of geographical locations are encouraged. Linking a hotel's name not just with the city they are located, but, either through naming or the purchase of

keywords from search sites, with their region, state or even country could prove beneficial in capturing potential visitors with an interest in their area.

Further cross-marketing opportunities should not be overlooked with other tourism providers. As noted in Table 3, during the course of the reviewed accommodation searches, many searchers deviated to other sectors, such as attractions and restaurants (or the hotel search may have been the deviation). When these searchers detour along the course of their search via a 'click' to the attraction website, a well placed hotel link might snag the potential visitor for your property, rather than having them return to the search engine with the hope that his/her next search engine provided a link to your hotel.

On a more macro level, this research has confirmed earlier work by Vogt and Fesenmaier (1998) that found travelers' web-searches tend to be highly functional and rarely hedonic. Of the 701 accommodation related searches investigated herein, zero contained descriptive keywords such as comfortable or beautiful. This suggests that search engines were viewed as a tool for getting desired information in as direct manner as possible. Thus, while including pretty pictures and other niceties on a website undoubtedly help stimulate booking behavior once the potential traveler has reached the site, such descriptive words are unlikely to drive 'eyeballs' to the website in the first place.

In conclusion, marketers are advised to consider the data in the tables and the linkages displayed in Figure 1 to determine if their property or brand could benefit from the addition of keywords or from the linkages suggested. They should also never cease to experiment with the addition of new keywords to their website, seeking to find those that best align with the search behaviors of their potential guests. Having a website that captures the imagination of potential travelers and hopefully motivates purchase is indeed important. But before the potential guest sees the website they first need to find their way there, and has been noted herein, the majority of traveler searchers use the search engines as their portal to the wonders of the Internet. This study of Excite searches hopefully has provided some new ideas, or at least confirmed existing beliefs, on how best to

accomplish the challenge of getting these folks surfing via a search engine, to visit the hotel electronically, the first step in getting 'heads in beds'.

## **LIMITATIONS AND FUTURE STUDIES**

The major limitation of this study relates to the age of the dataset. While somewhat dated, when the analysis was conducted it was the only dataset available to the best of our knowledge. As such, our choice was to explore the interesting questions in this paper, or pass on the challenge for lack of more ideal data. While the authors' answer to this question is obvious, it is up to the reader to determine for him/herself how significant an impediment this date lag represents. It should be noted, however, that Spink, Jansen, Wolfram and Saracevic (2002) in an earlier study that compared search behaviors of an earlier (Spink, Bateman, & Jansen, 1999) Excite dataset with the one used herein, that there had been little change in the usage patterns. While it is difficult to extrapolate further from this, the suggestion is that the findings herein may be relatively stable over time.

Regarding future research, the current research has focused solely upon the lodging industry. With the continued growth and dominance of the Internet as an information source and transaction channel for all types of travel purchases, future exploration of travel search behavior of other segments would be equally worthwhile.

## **POSTSCRIPT**

As this paper was in its very final stages, AOL posted on the web, ostensibly for the benefit of the academic community, a dataset of several hundred thousand searches. This caused us to consider this new dataset as an alternative, as clearly it resolved the issue of the date of our data. But AOL's release of these data immediately caused an uproar following Barbaro and Zeller's (2006) *New York Times* (NYT) article that reported how easily they had used the search data to identify a specific user through what she had assumed to have been her confidential searches. AOL immediately withdrew the dataset

and apologized for their error in releasing them. While the data remains widely available on secondary websites that downloaded it before AOL's change of heart, we felt that its use would be inappropriate and unethical for this study, or any other, without the specific approval of AOL, which clearly was not going to happen.

It is important to point out that that the Excite dataset is constructed very differently from AOL's. While AOL did not use subscriber names they did provide unique identifiers. What the *NYT* and other easily noted was that these could be consolidated by the identifier to provide a three month trail of searches for a specific user. Clues within these, to include 'ego searches' when one looks up ones own name on the search engine, provided hints that cumulatively allowed one to identify the searcher. The Excite dataset provided search sessions from the same IP addresses within one day without specific date information, and thus made it a lot less likely to identify a specific user and reveal their other private searches. No complaints have been filed since the Excite data were revealed six years ago. Additionally, and perhaps more importantly, Excite data were provided only to a limited number of members of the research community and never made publicly available (aka the AOL data). Given the above, while we believe that the AOL data should be considered 'untouchable', we do not feel any hesitation in exploring the Excite dataset. And, by all appearances, in light of both the AOL debacle and the significant news surrounding Google's recent refusal to submit its search log data to the USA federal government (Fisher, 2006; Sanchez, 2006), it is highly doubtful that researchers will any time soon be able to obtain large amount of log data from the major search engines. Given the above, the Excite dataset, explored herein, seems to be the best option available, and in our opinion, its exploration has been a more than worthwhile endeavor.

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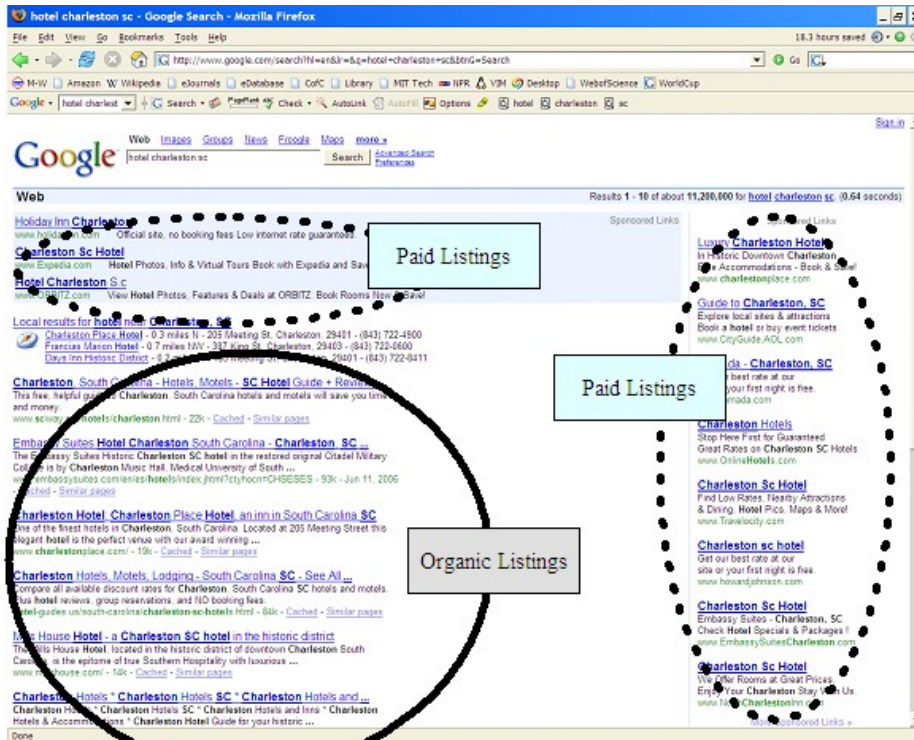
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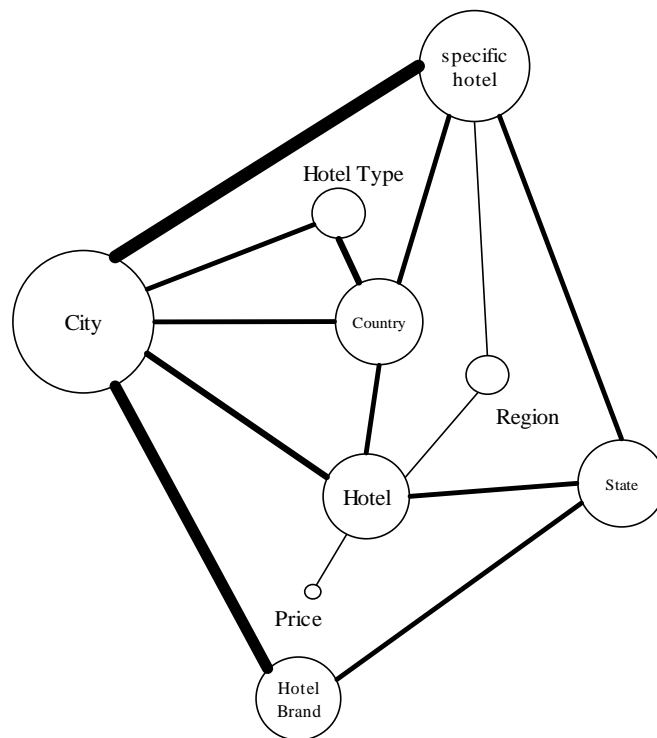
NOTE: 2 Figures and 5 Tables follow.

# FIGURES AND TABLES

**Figure 1.**  
**Organic Listings and Paid Listings on a Search Engine**



**Figure 2.**  
**Associations of Accommodation Search Keywords**



**Table 1.**  
**An Example of an Excite User Search Session**

<b>Query ID</b>	<b>User Session ID</b>	<b>Time</b>	<b>Query Keywords</b>
40000	000000000000281b	172749	prime rate motel
40101	000000000000281b	174447	friendly host motel
40102	000000000000281b	174831	holiday inn express Minnesota
40103	000000000000281b	175826	hotels twin cities
40104	000000000000281b	180749	bloomington mn motels

**Table 2.**  
**Hotel Keywords**

<b>Keywords</b>	<b>Keywords</b>
Hotel	Marriott
Motel	Best Western
Hospice	Hyatt
Hostel	Radisson
Inn	Sheraton
Bed-and-breakfast	Ritz-Carlton
Bed and breakfast	Fairmont
Bed & breakfast	Wyndham
Accommodation	Four Seasons
Resort	Super 8
Campground	Ramada
Hilton	Westin

Note: While the above listing is not all inclusive, it represents frequently used keywords and brands and provided a reasonable sample for testing. Hotel chains that included keywords already in the above list, such as Holiday Inn and Hampton Inn are not included, as the word 'Inn' would have captured these. Similarly, sub-brands, such as Courtyard by Marriott or Hilton Garden Suites were captured as a result of the inclusion of their corporate brand in their name.

**Table 3.**  
**Most Common Query Keywords**

<b>Query Type</b>	<b>Frequency</b>	<b>Percent</b>
City	311	49.0%
specific hotel	162	25.5%
hotel	115	18.1%
hotel brand	109	17.2%
country	75	11.8%
state	73	11.5%
travel	60	9.4%
hotel type	33	5.2%
region	31	4.9%
specific attraction	30	4.7%
specific activity	16	2.5%
activity type	8	1.3%
attraction type	6	0.9%
price	5	0.8%
restaurant	5	0.8%
specific activity	5	0.8%
transportation brand	4	0.6%
transportation	3	0.5%
activity	3	0.5%
reservation	3	0.5%
hygiene	2	0.3%
attraction	2	0.3%
souvenir	2	0.3%
pet-friendly	2	0.3%

Note: the above adds to >100% as most queries included multiple search terms.

**Table 4.**  
**Most Common Query Types**

<b>Query Type</b>	<b>Frequency</b>	<b>Percent</b>
<b>specific hotel</b>	<b>89</b>	<b>14.0%</b>
<b>hotel brand</b>	<b>67</b>	<b>10.6%</b>
city + <b>hotel</b>	<b>53</b>	<b>8.3%</b>
<b>specific hotel</b> + city	<b>45</b>	<b>7.1%</b>
<b>hotel brand</b> + city	<b>30</b>	<b>4.7%</b>
city	23	3.6%
specific attraction	16	2.5%
<b>hotel</b>	<b>15</b>	<b>2.4%</b>
city + country + travel	14	2.2%
city + travel	13	2.0%
travel	10	1.6%
city + state	10	1.6%
<b>specific hotel</b> + state	<b>8</b>	<b>1.3%</b>
city + country	7	1.1%
<b>hotel type</b>	<b>6</b>	<b>0.9%</b>
country + <b>specific hotel</b>	<b>6</b>	<b>0.9%</b>
city + state + <b>hotel</b>	<b>6</b>	<b>0.9%</b>
city + <b>hotel type</b>	<b>6</b>	<b>0.9%</b>
attraction type + city	5	0.8%
<b>hotel type</b> + <b>country</b>	<b>5</b>	<b>0.8%</b>
city + country + <b>hotel</b>	<b>5</b>	<b>0.8%</b>
state + travel	5	0.8%
region + city	5	0.8%

Note: All search terms or combination of search terms used at least five times have been included in the table. The above adds to 70.6% with the balance comprised of those combinations found less than five times in the sample.

**Table 5.**  
**The Sequence of Switching Query Keywords**

Travel Aspect	Switch Behavior	Cases	Percent
Location	Zoom-out	921	25.0%
	Stay	1828	49.6%
	Zoom-in	936	25.4%
Accommodation	Zoom-out	253	19.1%
	Stay	847	64.1%
	Zoom-in	222	16.8%

**END OF PAPER ■**