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A Multi-Criteria Decision-Making Approach to Compare and Contrast the Websites of China-based and U.S.-based Hotels

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Abstract

The improvement in living standards and the development of telecommunications have led to a large increase in the number of Internet users in China. It has been reported by China National Network Information Center that the number of Internet users in China has reached 33.7 million in 2001, ranking the country third in the world. This figure also shows that more and more Chinese residents have accepted the Internet and use it to obtain information and complete their travel planning. Milne and Ateljevic stated that the integration of computing and telecommunications would create a global information network based mostly on the Internet. The Internet, especially the World Wide Web, has had a great impact on the hospitality and tourism industry in recent years. The WWW plays an important role in mediating between customers and hotel companies as a place to acquire information, acquisition and transact business.

Keywords

Rob Law, Asia

A multi-criteria decision-making approach to compare and contrast the websites of china-based and U.S.-based hotels

By Rob Law and Kathy Liang

The improvement in living standards and the development of telecommunications have led to a large increase in the number of Internet users in China. It has been reported by China National Network Information Center¹ that the number of Internet users in China has reached 33.7 million in 2001, ranking the country third in the world. This figure also shows that more and more Chinese residents have accepted the Internet and use it to obtain information and complete their travel planning. Milne and Atejevic stated that the integration of computing and telecommunications would create a global information network based mostly on the Internet.² The Internet, especially the World Wide Web, has had a great impact on the hospitality and tourism industry in recent years. The WWW plays an important role in mediating between customers and hotel companies as a place to acquire information acquisition and transact business.³

The use of the Internet enables hospitality and tourism businesses to reach customers worldwide easily and

cost-effectively. Wan pointed out that the Internet has changed the daily lives of individuals, the operation of companies and organizations, and the ways by which they seek information.⁴ Jeong stated that many lodging companies have been striving to achieve and retain a competitive advantage in the age of electronic commerce by developing unique and creative products and services.⁵ However, the current stage of development of China-based hotel websites and whether such websites can meet the needs of customers is largely unknown. Since the United States is the country in which the Internet originated and one of the most developed regions of the world in terms of online hotel applications, a study to compare the performance of hotel websites in the U.S. and China should, therefore, be of interest to the hotel industry in China.

A few published articles have compared and contrasted hotel and tourism websites in terms of reservation services between Asian and North American airline websites⁶, airfare reservation services between

Asian-based and North American-based travel websites⁷, and hotel reservation services between Asian-based and North American-based travel websites.⁸ The empirical findings of these frequency-counting studies all indicated that the Asian-based websites were significantly outperformed by the North American-based websites. The existing hospitality and tourism literature, however, offers no insights on the performance of China-based hotel websites relative to their Western counterparts. Huang and Law and Liang and Law briefly discussed the weak contents of hotel websites in China, but offered no information about the performance of these websites relative to those of other regions.⁹ In view of the importance of Internet applications to the Chinese hotel industry and the absence of prior studies quantitatively evaluating the quality of China-based hotel websites, this study attempts to bridge such a gap by presenting a multi-criteria decision-making model to measure the performance of hotel websites. The developed model was then applied to the selected U.S.-based and China-based hotel websites in order to compare their performance. In this research, website performance primarily relates to functionality, which involves analyzing the richness of the information on the

services/products mentioned in the website. The findings of this study, which contribute to a better understanding of the quality of hotel websites in China and the U.S., should be of interest to hospitality researchers, practitioners, policy makers, and customers.

Literature review

Ever since the introduction of the Internet to commercial businesses in the 1980s, researchers and practitioners have been fascinated by the unique properties and potential benefits that the technology can offer to the business world. Afuah and Tucci listed the many properties of the Internet that had a potential impact on business models and industry profitability.¹⁰ Examples of these properties include the Internet's use as a mediating technology, its universality, network externalities, its use as a distribution channel, its usefulness as a time moderator, its infinite virtual capacity, its low cost standard, and its potential to reduce transaction costs. Apparently, the most important aspect of the Internet is its connectivity. That is, the ability to allow everyone to access the network, which enables data to be transferred among computer operators. The Internet connects companies with companies, companies with customers, and people with people without limitations in time, space, and

hardware/software platforms.¹¹ Liu further argued that the Internet offers substantial advantages over traditional means of communication such as reduced costs of information exchange, increased speed of information transfer and retrieval, increased customer involvement in and control of transactions, and greater flexibility in using the marketing mix.

Anyumba stated that the Internet has been referred to as the "Information Superhighway" for several reasons.¹² First, there is probably no major business that does not have a website on the Internet. Second, the information is available and updated, and grows on a continuous basis. In addition, information can be accessed from any point on earth and at any time. Lastly, the Internet can convey the written script, and visual, static, and dynamic images, as well as sound. The Internet can allow an organization to conduct a more targeted business 24 hours a day with a potential to reach a worldwide audience with access to connections, irrespective of geographical locations, time zones, or computer systems. In the context of hotels, the Internet provides an equal opportunity to access the market for all types/sizes of properties. The major benefit of marketing on websites is the larger degree of interactivity compared to

other communication media.¹³

According to Deitel, Deitel, and Steinbuhler, the Internet is one of the most influential inventions in terms of the profound impact it has had on humankind.¹⁴ The Internet allows people to work more easily and quickly, enables information to be accessible instantly and conveniently around the world, and helps individuals and small businesses to get worldwide exposure. In short, the Internet has changed the way people do business.

Internet marketing is well suited for hospitality and tourism related products and services because of the distinctive high-priced, high-involvement, and well-differentiated characteristics of such products and services. Morrison et al. also pointed that there were six potential advantages for hotels of having a Web presence.¹⁵ These advantages include cost reductions, revenue growth, niche marketing, improved customer satisfaction, quality improvement, and the ability to address other critical business or customer needs. Similarly, Van Hoof and Combrink conducted a research that showed that there were six major benefits for hotels, including: increased exposure for the hotel, another means of advertising and marketing, faster and better communication, a way of generating reservations, a good source of information on clients and

the industry, and a way to save costs and time.¹⁶

The hotel industry in China is a fast-changing one, and the Internet has thus had a great impact on it.¹⁷ Liang and Law stated that many hotels in China had already realized the importance of the Internet, and had been establishing or enhancing their websites.¹⁸ These hotel managers hoped that their websites would enhance the image of their hotels, attract more customers, and promote sales. Gilbert, Powell-Perry, and Widijoso emphasized that the real determinant in using websites was the willingness of customers to book hotel rooms and to search for hotel information.¹⁹

Some prior studies have been performed to measure the performance of hotel and tourism websites using content analysis. For instance, Doolin, Burgess, and Cooper proposed an eMICA model, consisting of three stages, to examine New Zealand's twenty-six RTOs (Regional Tourism Organizations).²⁰ The three stages used different levels of business processes, including Web-based promotions, the provision of information and services, and the processing of transactions. Each RTO site was then assigned an appropriate stage and layer in the eMICA model based on the level of development of the site. The New Zealand RTOs generally displayed moderate-to-high

levels of interactivity. This was consistent with their role of providing comprehensive information of the marketing of destinations. The resulting data set was checked against Australian regional tourism sites. Doolin, Burgess, and Cooper found that there was a good level of consistency between these two countries. In other words, most of the organizations in New Zealand and Australia were at a relatively advanced stage in the adoption of the Internet.²¹

Morrison *et al.* presented a framework that applied the balanced scorecard approach to evaluate the performance of small hotels in Scotland.²² The framework consisted of four perspectives. Each of these perspectives, in turn, comprised different success factors. Individual scores were then assigned to all of the selected factors, based on a set of rating criteria. A drawback to modified balanced scorecard approach is the lack of involvement from the user. Similar to Morrison *et al.*'s approach, Chung and Law and Law and Chung conducted a study to analyze the contents of hotel websites.²³ They proposed a stepwise refinement multi-dimensional conceptual framework, and then used this framework to assess hotel websites in Hong Kong. Empirical findings showed that there were significant differences among different categories of hotels. This model covered the

major areas of application of hotel websites such as their use as a propaganda tool, communication tool, marketing and distribution channel, and customer service centre, as well as the management of websites. The proposed multi-dimensional conceptual framework, however, has two limitations. The first limitation is the restrictive involvement of hotel practitioners during the stage of developing the framework. The second limitation is the assumption of equal variance between different website dimensions and attributes, which unfortunately does not represent the reality in a multi-criteria decision-making environment.

To summarize, the empirical findings on the performance of hotel websites can unambiguously allow customers to determine the contents of a hotel's website and the level of services offered. The findings can also help hotel practitioners identify their relative standing in the industry, and to improve on factors in which they are weak.

Methodology the modeling process

Following the scoring model presented by Taylor and the assessment tool discussed by Evans and King and Zeleny²⁴, this research proposed that the overall functionality performance of a hotel website can be

measured by a total score T in the following form:

$$T = \sum_{i=1}^t (w_i * r_i) \dots (1)$$

where w_i and r_i represent the weight (relative importance) and rating (relative performance) of the attribute (factor) i for a total of t attributes (multi-criteria). Again, functionality refers to the richness of the information offered in a website.

On the basis of prior studies on hotel functionality measurements,²⁵ this research then formulated the dimension vector $D = [d_1, d_2, \dots, d_l]$ for l dimensions of a hotel's website, which determines the performance of the website. Prior studies have stated that measurements of the performance of a hotel website should be multi-dimensional.²⁶ This means that a website should be evaluated on more than one dimension. Hence, this stage identified $A_{d1} = [a_{d1a}, a_{d1b}, \dots, a_{d1m}]$, $A_{d2} = [a_{d2a}, a_{d2b}, \dots, a_{d2n}]$, ..., $A_{dl} = [a_{dla}, a_{dlb}, \dots, a_{dli}]$, where each A_{di} is the attribute vector that contains the necessary attribute components for the dimension i , for $i = 1, 2, \dots, l$.

The next stage of this research involved a panel of experienced users of hotel websites, including hoteliers, business travelers, leisure travelers, travel agents, and online reservations managers. A convenient sampling approach was used in early-mid 2003 to invite people in China to become

members of the panel. In this stage, a jury of executive opinion was asked to comment on, revise, and finally validate the contents of the dimension and attribute vectors, D , A_{d1} , A_{d2} , ..., A_{dp} acquired at the previous stage. Tables 1 to 5 listed the validated dimensions and their associated attributes. This validation panel then

Table 1: Attributes in the dimension of facilities information

Attribute	Description
A1. Photos	Key factor(s): Exterior photo, Room photo, Restaurant photo Sub-factor(s): Other facilities and services photo Special factor(s): Photo Gallery
A2. Hotel Description	Key factor(s): Brief introduction Sub-factor(s): Fact sheet Special factor(s): Event, History, Honor, Welcome Message
A3. Hotel Facilities	Key factor(s): Room division, Restaurant division Sub-factor(s): Health facilities, Entertainment facilities, Convention facilities Special factor(s): Business center, Shopping arcade, Transportation service, Travel service
A4. Guest Room Facilities	Key factor(s): Room type Sub-factor(s): In-house service and facilities Special factor(s): Layout of room
A5. Hotel Location Map	Key factor(s): Map with definition Sub-factor(s): Distance information, Direction guide, Streets and major sites around the hotel Special factor(s): Enlargeable map, Download function
A6. Hotel Promotion	Key factor(s): Special offer Sub-factor(s): Packages Special factor(s): Niche market promotion
A7. Virtual Tour	Key factor(s): With virtual tour Sub-factor(s): Virtual tour with guest room, restaurant, lobby Special factor(s): With other facilities and services
A8. Restaurant	Key factor(s): Cuisine features and type Sub-factor(s): Hours of operation, location, bar Special factor(s): Menu, reservations, special promotions
A9. Frequent Guest Program	Key factor(s): Program information, benefits and privileges Sub-factor(s): Terms and conditions, online enrollment Special factor(s): Personalized web page, create/modify Profile, Privacy Statement
A10. Meeting Planner/MICE	Key factor(s): Conference facilities and service information Sub-factor(s): Layout of function room, capacity, size, area Special factor(s): Meeting planner
A11. Employment Opportunities	Key factor(s): Employment page Sub-factor(s): Job description, qualifications required, contact information Special factor(s): Online application form, career prospects

Table 2: Attributes in the dimension of customers' contact information

Attribute	Description
B1. Email Address	Key factor(s): Prime email address Sub-factor(s): Email address with own domain suffix Special factor(s): Email address by departments/person
B2. Telephone Number	Key factor(s): Prime telephone number Sub-factor(s): Country code, area code Special factor(s): Direct telephone to departments/person, toll-free telephone number
*B3. Hotel Address	Hotel Address
B4. Fax Number	Key factor(s): Prime fax number Sub-factor(s): Country code, area code Special factor(s): Direct fax to departments/person
*B5. Online Forum	Online forum
#B6. Feedback Form	Key factor(s): Feedback form/contact forms Sub-factor(s): Prompt reply
*B7. Frequently Asked Questions	With FAQ Page
B8. What's New/Press Release	Key factor(s): With WHAT'S NEW or PRESS RELEASE page Sub-factor(s): With updated information Special factor(s): Press contact information, media inquiries, journalists registration
B9. Person to Contact	Key factor(s): Name Sub-factor(s): Email address, telephone number Special factor(s): Contact person by department/position

Note: "*" indicates the attribute with only one factor
 "#" indicates the attribute with key factor(s) and sub-factor(s).

determined the relative importance of $D, A_{d1}, A_{d2}, \dots, A_{di}$ in terms of numeric weights (w). Specifically, respondents were asked to provide a numeric percentage weight for each element in $D, A_{d1}, A_{d2}, \dots, A_{di}$ subject to the total weight in each of $D, A_{d1}, A_{d2}, \dots, A_{di}$ equal to 100%. Having collected all of the data from the respondents, the aggregate weight of each dimension and attribute was derived by averaging the individual weights. At the end of this stage, the following weights were constructed:

$$w_{d1}, w_{d2}, \dots, w_{di} \text{ subject to } \sum_{i=1}^n W_{di} = 100\%$$

$$w_{ad1a}, w_{ad1b}, \dots, w_{ad1n} \text{ subject to } \sum_{i=1}^n W_{di} = 100\%$$

$$w_{ad2a}, w_{ad2b}, \dots, w_{ad2n} \text{ subject to } \sum_{i=1}^n W_{di} = 100\%$$

$$\vdots \vdots$$

$$w_{ada}, w_{adb}, \dots, w_{adp} \text{ subject to } \sum_{i=1}^n W_{di} = 100\%$$

After that, the validation panel determined a subjective rating scale r_{adi} for attribute a_{di} for i, j in the following form:

- (i) For attributes with only one factor, 0 was assigned if the factor was not listed and 5 is assigned if the factor was listed.

Table 3: Attributes in the dimension of reservations information

Attribute	Description
C1. Room Rates	Key factor(s): Room rate for different types of rooms Sub-factor(s): Internet rate Special factor(s): Niche market rate or last-minute rate
# C2. Check Rate and Availability	Key factor(s): Check rate and availability Sub-factor(s): With instant response
# C3. Online/Real Time Reservation	Key factor(s): With online reservation function Sub-factor(s): Instant confirmation
C4. Reservation Policy	Key factor(s): With reservation policy Sub-factor(s): Guarantee policy, cancellation policy Special-factor(s): Family plan or children's plan
# C5. View or Cancel Reservation	Key factor(s): Online cancellation, online retrieval Sub-factor(s): Instant response
* C6. Worldwide Reservation Phone Numbers	With worldwide reservation phone numbers
# C7. Security Payment System	Key factor(s): Encryption system Sub-factor(s): Payment instruction, credit card information
# C8. Check-in and Check-out Time	Key factor(s): With such information Sub-factor(s): Early check-in and late check-out policy
* C9. Special Request Form	Special request form
* C10. Payment Option	With payment option
* C11. Privacy Policy	With privacy policy
* C12. Currency Converter	Currency converter

Note: "*" indicates the attribute with only one factor
"#" indicates the attribute with key factor(s) and sub-factor(s).

(ii) For attributes with key factor(s) and sub-factor(s), 0 was assigned if no attribute was listed, 1 was assigned if a few factors were listed, 2 was assigned if most of the key factors or a few key factors with some sub-factors were present, 3 was assigned if all of the key factors were found, 4 was assigned if key factors and some sub-factors were listed, and 5 was assigned if key factors and all sub-factors were listed.

(iii) For other attributes, 0 was assigned if no attribute was found, 1 was assigned if a few factors were

present, 2 was assigned if all key factors were listed, 3 was assigned if some key factors and some sub-factors or some special factors were listed, 4 was assigned if key factors and all sub-factors were present, and 5 was assigned if all key-factors and sub-factors and most or all special factors were found.

The sampling process

The U.S. is the origin of the Internet and the region with the largest number of Internet users in the world²⁷, while China is one of the fastest-growing

Table 4: Attributes in the dimension of information on surrounding area

Attribute	Description
D1. Transportation	Key factor(s): How to get to the hotel Sub-factor(s): Limousine service or subway/ferries/taxis/cars/shuttle buses Special factor(s): With direction or booking functions
D2. Airport Information	Key factor(s): How to get to/from the airport Sub-factor(s): Distance information, timetable Special factor(s): Other airport information
D3. Main Attractions of the City	Key factor(s): With page introducing attractions Key factor(s): With page introducing attractions Sub-factor(s): Distance information, transportation mode Special factor(s): With detailed guide
D4. General Information on the City	Key factor(s): Introduction to the city Sub-factor(s): Online clock or calendar, weather, currency Special factor(s): Entertainment, dining, shopping, business tips
*D5. Public Holidays	Public holidays

Note: "*" indicates the attribute with only one factor

Table 5: Attributes in the dimension of the management of the website

Attribute	Description
*E1. Up-to-date Information on the Site	Contains up-to-date information
#E2. Multilingual Site	Key factor(s): Two Languages Sub-factor(s): More than two languages
*E3. Site Map	Site map
*E4. Search Function	Search function
#E5. Link to Partners	Key factor(s): With linkage Sub-factor(s): With linkage to partners and more useful sites
E6. Website Design/ Multimedia	Key factor(s): 360-degree panoramic photos Sub-factor(s): Audio/video or live talk on the site Special factor(s): Flash, flash skip, picture zoom-in/out

Note: "*" indicates the attribute with only one factor
"#*" indicates the attribute with key factor(s) and sub-factor(s).

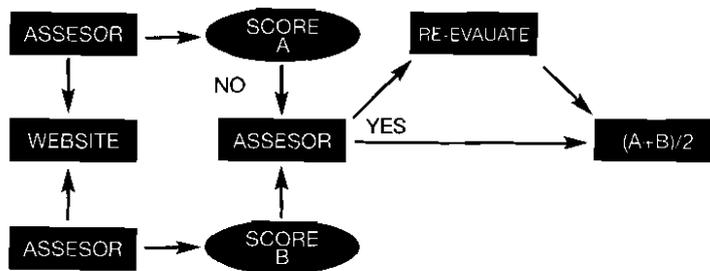
markets in the world and recently became the region with the world's second-largest number of Internet users.²⁸ As previously stated, the primary objective of this study is to build a multi-criteria decision-making model to compare and contrast the functionality performance of China-based and U.S.-based hotel websites.

To ensure that the selected hotel websites were comparable, the selection criteria included: i) independent hotels, ii) business hotels in major cities, and iii) hotels of three stars or above. The star-rating systems in both regions are similar²⁹, and hotels in lower categories were excluded because they have a lower tendency to use technology. The process of searching for hotel websites was done through expedia.com, ctrip.com, and google.com. Eventually, ninety hotel websites were selected for each region, with thirty websites in each category of hotel.

The evaluation process

At this stage, a numeric value R_{adj} was assigned to each attribute in $A_{d1}, A_{d2}, \dots, A_{di}, i, j$, representing the rating of the attribute and using the judgmental rating scale rad_{ij} developed in the modeling process. Two independent evaluators, who were experienced hotel website users, assessed each of the selected hotel websites. Figure 1 delineates the evaluation process. Such a process can detect and eliminate potential bias or misinterpretation. Wan, Sweeney, and Evans and King also supported the use of multiple assessors in the process of evaluating a website.³⁰ For each hotel website, the empirical outcome in this process was a set of rating scores $[R_{ad1a}, R_{ad1b}, \dots, R_{ad1m}, R_{ad2a}, R_{ad2b}, \dots, R_{ad2n}, \dots, R_{adla}, R_{adlb}, \dots, R_{adlp}]$, denoted by R , for all attributes in $A_{d1}, A_{d2}, \dots, A_{di}$.

Figure 1: A hotel website evaluation process



Score A: given by Investigator A
Score B: given by Investigator B

The functionality performance score of an attribute a_{ij} , i, j , was then reflected by the corresponding element in R . Next, the performance score of a dimension d_k , k , denoted by T_{dk} was computed by:

$$T_{dk} = 20 \times \sum_{i=1}^n W_{adj} \times R_{adj} \dots (2)$$

The overall relative weight for all attributes, in contrast to the relative weight within a dimension, was then computed. The overall weight W_{adi} of attribute a_{ij} was obtained by:

$$W_{adij} = 20 \times w_{adij} \times w_{di} \dots (3)$$

After that, let $W = [W_{ad1a}, W_{ad1b}, \dots, W_{ad1m}, W_{ad2a}, W_{ad2b}, \dots, W_{ad2n}, \dots, W_{adja}, W_{adjb}, \dots, W_{adjp}]$, and the total performance score T of a hotel website was computed by:

$$T = W \times R \dots (4)$$

Hence, the performance scores for dimensions and for the whole website are in the range of 0 to 100, inclusive. A high score indicates that the performance of a specific measurement is good, whereas a low score is associated with weak performance.

Findings and analysis

The results of the panel discussion on the weights of all dimensions, and the associated attributes in each dimension

are presented in Tables 6 to 11.

As presented in Table 6, among the perceived weights of all dimensions, the most important dimensions were Facilities Information and Reservations Information, which received relative weights of 26.38 and 26.13, respectively. The least important dimension was Surrounding Area Information, which received a weight of 11.62. Such findings appear reasonable because users of hotel websites and potential online purchasers view information on facilities and reservations as more important than information on the surrounding area. Similarly, Tables 7 to 11 list the weights of all attributes in each of the five dimensions.

The functionality performance of the selected hotels, grouped in different hotel categories, is presented in Tables 12 to 15.

Table 12 shows the performance results of the China-based three-star hotels and the U.S.-based three-star hotels. The U.S.-based hotel websites significantly outperformed the China-based hotel websites in all but one of the included dimensions. The only dimension that does not show a significant difference is Customers' Contact Information. In addition, the overall performance score of the U.S.-based three-star hotels is significantly larger than that of their corresponding Chinese counterparts.

Table 6: Weight scores of dimensions

Dimension	Weight
Facilities Information	26.38
Reservations Information	26.13
Customers' Contact Information	18.25
Management of Website	17.63
Surrounding Area Information	11.62
Total Score	100

Table 7: Weight scores of facilities information

Attribute	Weighted Mean Score
Photos of Hotel Features	15.38
Hotel Location Maps	11.38
Hotel Facilities	11.00
Hotel Description	10.75
Guest Room Facilities	10.00
Hotel Promotions	9.88
Virtual Tours	9.50
Frequent Guest Program	7.25
Restaurant	7.13
Meeting Planner/MICE	5.38
Employment Opportunities	2.38
Total Score	100

Table 8: Weighted mean scores of customers' contact information

Attribute	Weighted Mean Score
Email Address	20.13
Telephone Number	15.00
Hotel Address	11.88
Fax Number	11.25
Person to Contact	11.13
Feedback Form	9.38
Frequently Asked Questions	8.25
What's New/Press Release	7.75
Online Forum	5.25
Total Score	100

Table 9: Weighted mean scores of information on reservations

Attribute	Weighted Mean Score
Check Rates and Availability	17.75
Room Rates	13.25
Online/Real Time Reservation	12.50
Securities Payment System	9.50
View or Cancel Reservation	8.38
Payment Option	7.25
Reservation Policy	7.00
Worldwide Reservation Phone Numbers	6.00
Privacy Policy	6.00
Currency Converter	4.50
Check-in and Check-out Times	4.38
Special Request Form	3.50
Total Score	100

Table 10: Weighted mean scores of information on the surrounding area

Attribute	Weighted Mean Score
Transportation	28.13
Airport Information	27.00
Main Attractions of the City	20.38
General Info. on the City	15.25
Public Holidays	9.25
Total Score	100

Table 11: Weighted mean scores on the management of the website

Attribute	Weighted Mean Score
Search Function	24.50
Website Design/Multimedia	19.88
Up-to-date Information on the Site	14.75
Link to Partners	14.38
Multilingual Site	14.00
Site Map	12.50
Total Score	100

Similar to the three-star hotels, the U.S.-based four-star hotel websites received performance scores significantly higher than those of the China-based four-star hotel websites in four of the five dimensions (Table 13). The dimension that does not show a significant difference is Customers' Contact Information. Again, the overall performance score of the U.S.-

based four-star hotel websites is significantly larger than that of the China-based four-star hotels.

Likewise, Table 14 presents the performance scores of five-star hotels that were included. In this hotel category, U.S.-based hotel websites significantly score higher than China-based hotel websites in all dimensions and in overall website performance.

Table 12: Comparison of China-based and U.S.-based three-star hotels

Dimensions	China (n=30)		U.S. (n=30)		Sig.
	Mean	Std. Deviation	Mean	Std. Deviation	
Facilities Information	39.69	9.90	54.45	11.37	0.000*
Customers' Contact Information	45.15	11.42	47.63	16.79	0.505
Reservations Information	12.83	8.74	71.04	24.28	0.000*
Surrounding Area Information	6.14	1.15	27.91	2.47	0.000*
Management of Website	24.76	10.01	45.67	16.19	0.000*
Overall Performance	27.31	6.64	52.79	10.69	0.000*

* significant at $\alpha = 0.05$ based on independent samples *t* test.

Table 13: Comparison of China-based and U.S.-based four-star hotels

Dimensions	China (n=30)		U.S. (n=30)		Sig.
	Mean	Std. Deviation	Mean	Std. Deviation	
Facilities Information	40.91	6.84	59.71	12.42	0.000*
Customers' Contact Information	43.73	14.20	48.73	13.44	0.166
Reservations Information	21.72	18.16	73.79	10.21	0.000*
Surrounding Area Information	4.39	7.55	37.52	22.62	0.000*
Management of Website	31.68	11.17	50.61	12.44	0.000*
Overall Performance	30.73	8.63	57.20	8.25	0.000*

* significant at $\alpha = 0.05$ based on independent samples *t* test.

Table 14: Comparison of China-based and U.S.-based five-star hotels

Dimensions	China (n=30)		U.S. (n=30)		Sig.
	Mean	Std. Deviation	Mean	Std. Deviation	
Facilities Information	43.66	12.98	71.96	13.67	0.000*
Customers' Contact Information	44.21	16.81	53.30	14.74	0.030*
Reservations Information	19.63	22.26	72.65	24.78	0.000*
Surrounding Area Information	8.75	11.42	30.25	20.44	0.000*
Management of Website	32.57	11.08	53.61	20.53	0.000*
Overall Performance	31.49	11.60	60.87	12.69	0.000*

* significant at $\alpha = 0.05$ based on independent samples *t* test.

Table 15: Comparison of all China-based and U.S.-based hotels

Dimensions	China (n=90)		U.S. (n=90)		Sig.
	Mean	Std. Deviation	Mean	Std. Deviation	
Facilities Information	41.42	10.24	62.04	14.41	0.000*
Customers' Contact Information	44.36	14.16	49.89	15.09	0.042*
Reservations Information	18.06	17.56	72.49	20.67	0.000*
Surrounding Area Information	6.43	9.80	31.89	22.38	0.000*
Management of Website	29.67	11.21	49.96	16.85	0.000*
Overall Performance	29.85	9.27	56.96	11.07	0.000*

* significant at $\alpha = 0.05$ based on independent samples *t* test.

Lastly, Table 15 shows the performance results of all of the hotel websites in the U.S. and China that were included. In this research, the performance scores of the selected U.S.-based hotel websites were significantly larger than those of the China-based hotel websites in all dimensions and in the overall measurement. Apparently, U.S.-based hotel websites mainly use the Internet as a booking channel,

whereas China-based hotel websites used the Internet as a cyber-brochure. This result is consistent with the findings of Huang and Law³¹, which stated that the websites of China-based hotels look like "electronic brochures," whereas the websites of international hotels are "distribution and marketing channels."

Empirically speaking, the China-based hotel websites do not perform as

well as their U.S.-based counterparts. In general, all dimensional and overall website performance scores for the China-based websites are less than 50, indicating that the Chinese hotels have not invested enough in their websites. The dimension in the China-based hotels websites that received the highest performance score is Customers' Contact Information, which, unfortunately, is not an important dimension (Table 6). This finding is probably due to an insufficiency or absence of knowledge on website management on the part of hotel managers. It is true that these hotel managers have established an online presence for the hotel. However, these managers seemingly do not know how to provide the kind of content in their websites that would meet the needs of users. Basically, all dimensions and attributes on the China-based hotel websites need urgently need to be improved if the hotel industry is to remain competitive in the present business environment.

U.S.-based hotel websites, by contrast, do perform satisfactorily in most measurements. In particular, these websites perform best in Reservations Information, one of the most important dimensions, as indicated in Table 6. Such results indicate that hotel managers in the U.S. do take advantage of the Internet as an online distribution and booking

channel. With the increasing number of online customers, hotel managers in the U.S. need to be aware that providing good reservation services and facilities information may not suffice to serve the large needs of customers. In other words, to attract new customers and to retain existing customers, other dimensions of information should also be improved.

Conclusions

This study aims to measure the performance of hotel websites in the U.S. and China, and to compare and contrast selected websites in these two regions. On the basis of a multi-criteria decision-making model, a total of one hundred and eighty hotel websites were evaluated and analyzed. The evaluation included five dimensions and forty-three attributes. Empirical findings reveal that U.S.-based hotel websites significantly score higher than China-based hotel websites in all measurements, except in Customers' Contact Information for three-star and four-star hotels.

More international hotel chains have entered China and are competing with China's independent hotels. Although there is not much difference between China-based hotels and international hotels in terms of the provision of facilities and services, the disparity in their Internet applications will unambiguously influence their ability to compete. At present, most

customers in China still use conventional means to communicate with hotels, but many American customers have chosen to use the Internet to make reservations. The rapid development of the Internet in China will soon change the booking behavior of customers. Hence, hoteliers in China need to spend more effort developing their websites to meet the changing demands of the market.

As it has joined the World Trade Organization and will host the 2008 Olympic Games, China will have to accelerate the degree to which is opening up to the world. Since the Internet has become an important medium for interactive communications, the hotel industry in China should take full advantage of the technology to distribute products, offer customer services, and penetrate markets by setting up virtual hotels. This research, however, has shown that there is a large gap in the functionality performance of websites between China-based hotels and U.S.-based hotels. Based on the empirical findings, China-based hotels should use their websites as a tool for interactive communication, a distribution channel, and a customer service center, instead of only as a tool for promotion.

As a tool for promotion, a China-based hotel website can help potential customers browse through the products and services that are offered

in the hotel. In the same way, a hotel can use its website as a tool to enhance communications with customers. Likewise, hotels can use their websites as a channel to handle and process online reservations. As a customer service center, the provision of more value-added services such as information of the surrounding area can strengthen the understanding of customers and, hence, their confidence in the hotel. Lastly, a well-managed hotel website makes the site more attractive to users.

The number of commercial sites has been increasing and, with no signs of slowing down, travel has been the fastest-growing segment of online commerce.³² By the year 2020, China will become the world's number one tourist destination, with annual arrivals of 130 million, and will rank fourth among the world's top tourist-generating countries.³³ It will therefore be important for the hotel industry in China to make the same use of their websites as U.S.-based hotels do.

While the findings are interesting, there are two limitations to this study. First, the members of the validation panel were chosen using convenience sampling. In addition, panel members were all from China. Such limitations could lead to a lack of comprehensiveness in the views on developing the multi-criteria decision-making model. Naturally, one possibility for future research is to further enhance

and, eventually, to generalize, the measurements of the functionality or content of hotel websites by incorporating the views of a large group of users of hotel websites. In addition, it would be valuable to verify whether the research findings are in accordance with the real situation in the hotel industry. Such verifications can be performed through interviews with local hotel practitioners. This can ensure that the research findings are applicable to the local hotel industry.

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