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Heritage Tourism Web Portal Page Sequencing

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A tourism portal is a reliable interface for providing valuable information on the Web for the tourism industry. The purpose of this paper is to design an efficient portal for the heritage tourism industry. Correlation analysis is used to illustrate how heritage Web portal functionalities should be sequenced based on the level and direction of association between two or more functionalities. ANOVA analysis is used to assess the reliability of the data. Since portals are essential tools for e-commerce applications, results of the study can be utilized to enhance the efficiency of other e-commerce and e-government initiatives.

Field of Research: Portal Web Page Sequencing, Correlation, Heritage Tourism

1. Introduction

Heritage tourism is an essential subset of the tourism market and contributes significantly to social and economic development. It generates employment opportunities for host communities, generates foreign exchange earnings for host governments, and contributes significantly to governments' tax revenues. Consequently, the development of heritage tourism is considered by governments as an integral part of national and regional economic growth, especially for developing countries. The growth of the tourism market has enabled governments and the industry to explore the use of the We as a means of optimizing the potential benefits of tourism activities. However, as Puhretmair et al (2002, p. 57) state, most tourism information systems are fragmented, making it difficult for tourists to retrieve relevant information in a timely manner. As a result, there is a need for the heritage tourism industry to develop Web portals with focus on user-friendliness, and easy and timely access to information. Portals are search engines used to retrieve information on the Web. They contain Web pages that are sequenced by navigation tools, which are designed such that users have access to required information within a single location. Navigation tools are also designed in ways that allow them to be hierarchically layered. The layering (sequencing) of the navigation tools should ensure that related items (functionalities) are grouped next to each other so that users of the portal can easily retrieve information in an orderly and timely manner. This paper uses correlation and ANOVA analysis to group elements of tourism activities in a systematic manner, in order to enhance efficient retrieval of tourism information.

2. Review of Literature

An essential measure of the efficiency of a portal is its ability to provide needed information to users within a reasonable time frame. A tourism portal is a reliable

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interface that serves as a valuable information resource for the tourism industry. This study extends previous studies in the literature that examines issues of relevance for Web users, in order to enhance the efficient retrieval of information, while providing safeguards for the security of personal information and data.

A number of studies have been undertaken to address the most efficient forms of portal designs, and the use of information technology, especially as they relate to the tourism industry. Lam et al. (2003) developed a model approach for Web information discovery and filtering which uses simulated annealing algorithms to explore Web pages and retrieve information. The system is domain independent and does not rely on any prior knowledge or information about the Web content. Similarly, Gao et al (2006, p. 4) propose a prefetching strategy used to predict individual's information requests and generate results by mining past users information. The approach uses adaptive session generation method to extract navigational behaviors in collecting relevant pages from Web logs. A session-tree framework is used to organize sessions for fast retrieval. Historical information of individual's browsing behaviors is segmented into sessions based on time gap and session similarity. Based on these mechanisms, individual's in-coming requests can be predicted and results quickly retrieved. Palanisamy (2005, p. 77) provides a model for IS planning for which involves users in the IS planning process. The model is based on the hypothesis that user involvement in IS planning leads to IS flexibility; and that flexibility in IS enhances organizational flexibility and IS success.

Asllani and Lari (2007, p. 1771) used genetic algorithm to develop a decision support system for Web site optimization in order to minimize download time, and maximize Web site visualization and product association level. The algorithm ensures multiple criteria Web site optimizations, while the genetic search provides dynamic and timely information retrieval. Chau et al. (2006, p. 1219) propose a framework for developing integrated Web portals that support information searching and analysis for scientific knowledge. The framework incorporates collection building, meta-searching, keyword suggestion, and various content analysis techniques such as document summarization, document clustering, and topic map visualization. Tarafdar and Zhang (2006, p. 17) used factor analysis (with varimax rotation) across 200 Web sites from five different categories: retail, financial services, news and information, search and portal, and entertainment to establish the underlying composition of the factors that determine Web site performance. Results of the study identify six factors (information content, ease of navigation, usability, customization, download speed, and security) as determinants of Web site performance

In order to assess users' perceptions of portal efficiency, Kuo et al. (200, p. 312) developed a multidimensional scale, which analyzes user-perceived portal quality. Through an on-line survey of portal users, they found that customer satisfaction is related to empathy, ease of use, information quality, and accessibility. Users perceived service quality as the most effective indicator to model portal customer satisfaction. Heijden (2003, p. 546) used the concept of Technology Acceptance Model (TAM) to explain individual acceptance and usage of Web sites. The study examined perceived ease of use, usefulness, enjoyment, and their impact on attitude towards using, intention to use, and actual use of Web portals. Results showed that visual attractiveness of a Web site influences usefulness, enjoyment and ease of use.

Previous studies have suggested that one of the major concerns for Web users is the privacy of personal information on the Internet. This has great impact on the willingness of customers to use a particular Web site. For example, Yang et al. (2007, p. 135) conducted a study on the feasibility of applying an Internet-based information system to facilitate business alliance activities for small and medium sized firms. Their results show that while information sharing are the most important activities in business alliance, a lack of trust in Internet security was one key factor that may hinder businesses from applying Internet-base information systems to business alliance activities. Singh and Hill (2003, p. 644) investigated consumers attitudes towards Internet privacy in Germany, and found that consumers believe that companies and governments are obligated to protect personal information of consumers. On the issue of trust in government, Tolbert and Mossberger (2006, p. 361) used two-stage models to analyze survey data, in order to explore the relationship between e-government uses, citizens' attitudes about e-government, and trust in government. Their results suggest that e-government can increase process-based trust by improving interactions with citizens and perceptions of responsiveness. Citizen attitudes toward government, including trust, are core concerns for democratic governance and public administration.

On the issue of Web site accessibility, Williams et al. (2004, p. 583) examined the Web content and Web site accessibility of some German and UK tourism information sites. Their findings suggest low levels of accessibility for the tourism sites of both countries. This indicates that tourism organizations need to devise more efficient marketing and promotional mechanisms in order to effectively communicate with potential clients. Daniel and Ward (2006, p. 119) conducted a study on the development and early stage deployment of enterprise portals within two country councils in the UK. In both cases the portal is seen as a key element of e-government activities. They conclude that portals offer the councils a number of very significant benefits that will improve service delivery to citizens, including the ability to share information across their own directories and also to improve working with other agencies. In an attempt to examine the benefits of portals to traditional retailers who use shopping portals as their entry mechanism to the online trading environment, Kennedy and Coughlan (2006, p. 516) used a case study approach that combined documentary analysis and semi-structured interviews. Their findings suggest that using a shopping portal delivers several benefits to traditional retailers in terms of marketing synergies, site traffic generation, access to Web site management, and the ability to offer customers a multi-channel retailing experience. However, drawbacks may include partner interdependence and turnover, restricted organizational learning, and restricted delivery capabilities.

These observations suggest that portals play a vital role in the financial well being of an industry. This raises the question of how to ensure that heritage tourism portals are designed in a way that enhances their efficiency by reducing tourism information access time.

3. Portal Performance Metrics

Portal performance metrics are indicators of whether the Web site is successful. They are measured by tracking different traffic parameters associated with the portal. The most common parameter relates to the frequency of use of the portal, that is, how many people use the portal. The reach of a portal is an important aspect of the

performance because it measures the extent to which the portal is known and accessed by different people. The metrics used in measuring portal performance are: response time, throughput, reliability, and availability. Response time indicates how fast it takes the server to respond to a customer's requests. From the user's side, the essential components of time are browser time, network access time at the client side, ISP time, Internet time, network access time at the server side, and server response time. Throughput indicates requests per second or transactions per second, and determines the rate at which the system can adequately respond to requests.

For organizations using the Internet to conduct business, the portal is the "gateway" to the world. It is the interface through which potential customers carry out business with companies. Thus, appropriate design characteristics are required to make Web portals efficient. Consequently, portal efficiency measures and their influence on Web site performance have a direct impact on the success of an organization. Other efficiency measures for a Web portal include the information content, navigation characteristics, usability, personalization characteristics, and technical properties. Information on a portal should be relevant to the purpose of the Web site (Tarafdar and Zhang, 2006). The navigation characteristics should be user-friendly. Navigability depends on the manner in which the information is organized, and arranged, (i.e., layout and sequencing). This also includes the number and effectiveness of hyperlinks, and the overall organization of the information. Usability and ease of use of a portal facilitate effective information retrieval. Personalization characteristics and the capability to cater to customized information requirements of specific groups of customers, enhances the appeal of a portal. Finally, technical properties, such as security features, access speed, and accessibility of the portal are essential to how users perceive a portal's efficiency.

4. Heritage Portal Items

The study is undertaken to collect primary data from UAE tourists from different parts of the UAE to avoid bias. The designed questionnaires were distributed to 150 foreign tourists. The survey questions relate to 47 heritage portal functionalities shown in Table 1. The tourists returned 97 survey instruments and only 55 responses are found acceptable for analysis. The data is represented in a scale of 1 to 5, with 5 being most desired and 1 being the least desired. The portal functionalities are defined and explained and the correlation results are shown. Correlation analysis is used to illustrate how the layout of a heritage tourism portal can be designed. As shown in Table 1 and Figure 1, the ANOVA analysis and mean response of the functionalities are displayed. The ANOVA result is significant in P and F values to support the reliability of the information.

5. Correlation and ANOVA to design portal navigation tool functionality

The level of association between two functionalities is the correlation between both functionalities. Two functionalities are said to have *positive correlation* if both functionalities are likely to be simultaneously chosen or not chosen. A second possibility is that two functionalities may vary inversely. In such a case, a higher preference for one functionality is associated with a lower preference for the other, and vice versa.

Such a situation is regarded as *negative correlation.* The direction of association between two functionalities therefore, helps to determine if both functionalities should be separated of assigned together. This means that if two portal functionalities are correlated, then the access to one influences a user's inclination to browse the other.

In Table 2 the sample segment of the portal functionality correlation is displayed (see also Shamsuddin and Amagoh, forthcoming). By observing the correlation information, potential portal layout functionality navigation tool position is suggested. For instance, if the portal function provides the *Value added features*, the portal user may not browse the *Calendar of events* because of the negative correlation (-0.55) between the two. Thus, while designing the navigation tool, it is undesirable to group the two functionalities together. It is also expected that a user would not browse the *Availability of web cam and images* , while visiting the *Description of local features* since both functionalities are negatively correlated (-0.17). Hence, when assigning the navigation tool in portal layout, these two functionalities should be separated. Similarly, a portal user's need for *Tourist guide* links, may tend to browse the *Systematic link to other websites* because of the positive correlation (0.27) between the two. A customer is expected to navigate the *Hotel information* portal page when accessing the *Calendar of events* information because of the positive correlation (0.21) between the two. Additionally, *Price guide* and *Value added features* show a positive correlation of 0.42 indicating that by browsing one of the functionalities, a customer will be inclined to browse the other.

The ANOVA summary in Table 1 indicates the mean responses to each of the portal functionalities. An examination of the responses indicates that portal users more favorably prefer functionalities with higher mean scores. For example, *Easy access to the web* has the highest mean score of 4.327273, followed by *Interface for help, guide, information* (4.272727). The two next most important items as represented by the mean scores are *Tourist guide* (4.236364) and *Passport – Visa* (4.236364). A complete picture of the importance of each of the functionalities as depicted by the mean scores is shown in Figure 1.

6. Conclusion

This study enhances the applicability, utility, and efficacy of tourism portals, and shows how an efficient tourism portal can yield optimal benefits to all stakeholders. The study identifies the design parameters for an efficient heritage portal navigation layout. Using results from the survey questionnaire, correlation analysis is used to identify functionalities that should be grouped together or apart based on the level and direction of association between the functionalities. ANOVA analysis lends support to the reliability of the data used in the study. Such a design can serve the interests of government and the tourism industry through the exploitation and grouping of information in the databases to assist tourists their trip planning and decision making.

Portal design that clusters relevant tourism information enhances user-friendliness and effective retrieval of. Since tourism and especially heritage/ecotourism is a major source of income for governments around the world, any effort to facilitate its development should be part of governments' strategic plan towards economic, social and cultural development. Regional governments should have coordinated tourism

policies which should ensure adequate resource allocation to tourism departments for tourism developments (Priskin, 2003, p. 275; Nowak et al., 2003, p. 248). Additionally, to encourage return visits by tourists, the tourism industry should ensure that visitors have a comfortable experience during their stay by developing its own sets of voluntary self-regulatory practices (a self-imposed code of conduct) that strive to make the industry as efficient as possible. Such establishment of industry "best practices" should reflect the goals of the industry to enhance tourists' experience (Sorice et al., 2006, p. 74), and encourage return visits. The design concepts employed here are necessary to enhance the quality of services to tourists, and accelerate the growth of the tourism industry. Consequently, results of the study can be used to enhance the efficiency of other e-commerce and e-government applications.

Table 1. ANOVA Summary on Portal Functionality (0.05 Significance)

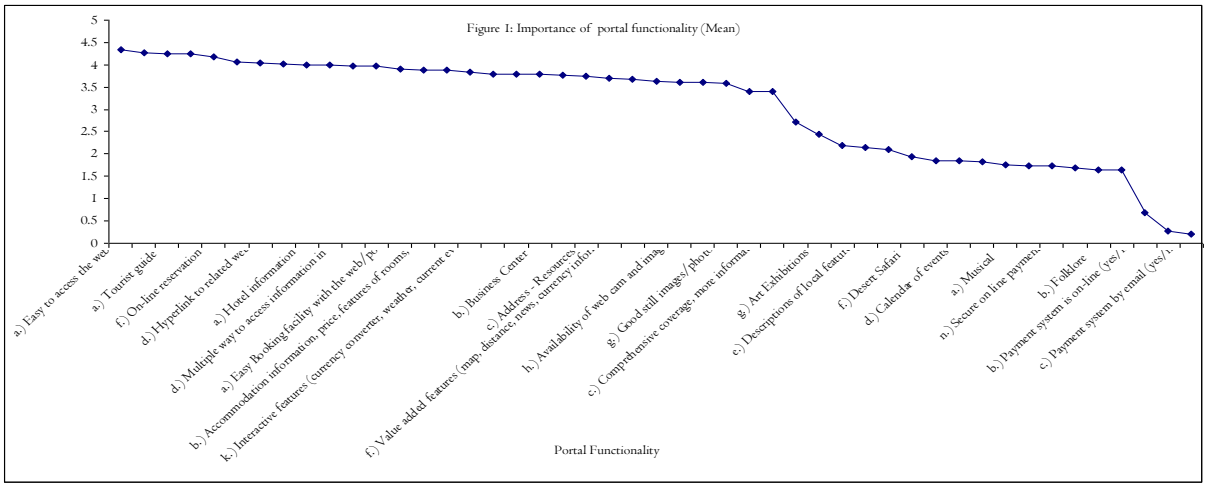
Anova: Single Factor: Summary						
Groups	*Count*	*Sum*	*Average*	*Variance*		
a.) Tourist guide	55	233	4.236364	0.961616		
b.) Directories of attractions	55	218	3.963636	0.628283		
c.) WWW guide	55	224	4.072727	0.846465		
d.) Calendar of events	55	102	1.854545	0.682155		
e.) Descriptions of local features	55	118	2.145455	1.23771		
f.) Value added features (map, distance, news, currency information)	55	202	3.672727	1.150168		
g.) Good still images/photos	55	197	3.581818	1.210774		
h.) Availability of web cam and images	55	198	3.6	1.392593		
i.) Systematic link to other web sites	55	200	3.636364	1.791246		
j.) Web based inquiry form or order (gifts, product…)	55	203	3.690909	1.06936		
k.) Interactive features (currency converter, weather, current event…)	55	209	3.8	1.051852		
l.) On line customer support, FAQ, search engines,,,,	55	96	1.745455	0.89697		
m.) Web Advanced features (e-mail updates, multimedia, chat, forum)	55	116	2.109091	1.024916		
n.) Secure on line payment	55	96	1.745455	0.600673		
a.) Hotel information	55	220	4	0.962963		
b.) Accommodation information, price, features of rooms, facility	55	213	3.872727	0.816835		
c.) Restaurant guide	55	121	2.2	1.274074		
d.) Price guide	55	198	3.6	1.059259		
e.) Contact information	55	214	3.890909	1.173064		
f.) On-line reservation	55	230	4.181818	0.744108		
a.) Musical	55	97	1.763636	0.66532		
b.) Folklore	55	90	1.636364	0.976431		
c.) Theatre	55	93	1.690909	0.587879		
d.) Golf	55	207	3.763636	0.887542		
e.) Boating	54	217	4.018519	0.810971		
f.) Desert Safari	55	107	1.945455	0.682155		
g.) Art Exhibitions	55	134	2.436364	1.509764		
a.) Heritage attractions	55	100	1.818182	0.855219		
b.) Castle, Museum, Monuments	55	90	1.636364	0.383838		
c.) Parks, Fauna, Flora	55	102	1.854545	1.052525		
a.) Easy to access the web	55	238	4.327273	0.520539		
b.) Easy to access information in this web	50	200	4	0.77551		
c.) Format of site is consistent (font/color..)	55	208	3.781818	1.247811		
d.) Multiple way to access information in web	55	219	3.981818	1.240404		
e.) Interface for help, guide, information	55	235	4.272727	0.609428		
a.) Simplicity & clear direction	55	187	3.4	1.17037		
b.) Information are up to date, current	55	150	2.727273	0.683502		
c.) Comprehensive coverage, more information	55	187	3.4	1.096296		
d.) Hyperlink to related web	55	222	4.036364	0.66532		
a.) Easy Booking facility with the web/portal	55	215	3.909091	0.973064		
b.) Payment system is on-line (yes/no)	55	38	0.690909	0.217508		
c.) Payment system by email (yes/no)	55	11	0.2	0.162963		
d.) Payment system by telephone (yes/no)	55	15	0.272727	0.20202		
a.) Education Center	55	211	3.836364	0.917172		
b.) Business Center	55	208	3.781818	0.951515		
c.) Address - Resources	55	206	3.745455	0.711785		
d.) Passport - Visa	55	233	4.236364	0.554209		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	3411.426	46	74.16143	83.59144	0	1.370932
Within Groups	2246.363	2532	0.887189			
Total	5657.789	2578				

Table 1: ANOVA Summary on portal functionality (0.05 Significance)

Table 2: Correlation of Sample Segment of Heritage Portal Functionalities (Significance 0.05%)

	a.) Tourist guide	b.) Directories of attractions	c.) WWW guide	d.) Calendar of events	e.) Descriptions of local features	f.) Value added features (map, distance, news, currency information)	g.) Good still images/photos	h.) Availability of web cam and images	i.) Systematic link to other web sites	j.) Web based inquiry form or order (gifts, product…)	k.) Interactive features (currency converter, weather, current event…)	l.) On line customer support, FAQ, search engines,,,,	m.) Web Advanced features (e-mail updates, multimedia, chat, forum)	n.) Secure on line payment	a.) Hotel information	b.) Accommodation information, price, features of rooms, facility	c.) Restaurant guide	d.) Price guide	e.) Contact information	f.) On-line reservation	a.) Musical	b.) Folklore	c.) Theatre	d.) Golf	e.) Boating
a.) Tourist guide	1.00																								
b.) Directories of attractions	-0.25	1.00																							
c.) WWW guide	0.26	-0.05	1.00																						
d.) Calendar of events	0.01	-0.11	-0.01	1.00																					
e.) Descriptions of local features	0.18	-0.12	-0.14	0.24	1.00																				
f.) Value added features (map, distance, news, currency information)	0.05	-0.08	0.46	-0.55	-0.30	1.00																			
g.) Good still images/photos	-0.22	0.20	-0.16	-0.09	-0.25	-0.04	1.00																		
h.) Availability of web cam and images	0.30	-0.15	0.39	0.23	-0.17	0.17	-0.10	1.00																	
i.) Systematic link to other web sites	0.27	0.13	0.27	-0.09	-0.20	0.08	0.12	0.42	1.00																
j.) Web based inquiry form or order (gifts, product…)	0.23	-0.04	0.08	-0.32	-0.18	0.53	0.23	0.19	0.06	1.00															
k.) Interactive features (currency converter, weather, current event…)	0.13	-0.24	0.15	0.00	0.10	0.28	-0.35	0.31	-0.06	0.24	1.00														
l.) On line customer support, FAQ, search engines,,,,	-0.38	0.17	-0.53	-0.11	0.01	-0.52	0.08	-0.23	-0.13	-0.39	-0.22	1.00													
m.) Web Advanced features (e-mail updates, multimedia, chat, forum)	-0.01	0.09	-0.32	0.28	-0.04	-0.56	0.20	-0.17	-0.23	-0.23	-0.26	0.36	1.00												
n.) Secure on line payment	0.06	-0.28	-0.12	-0.27	-0.02	0.00	-0.34	-0.19	-0.18	-0.19	-0.20	0.33	-0.24	1.00											
a.) Hotel information	-0.10	0.00	0.22	0.21	0.22	0.00	-0.16	-0.09	0.05	0.06	0.27	-0.27	0.10	-0.43	1.00										
b.) Accommodation information, price, features of rooms, facility	0.08	0.10	-0.09	-0.07	-0.10	0.17	-0.14	0.12	0.32	0.21	-0.06	-0.17	-0.21	0.01	-0.04	1.00									
c.) Restaurant guide	-0.16	0.21	-0.41	-0.28	-0.13	-0.13	0.39	-0.09	0.21	0.01	-0.32	0.31	0.30	-0.16	-0.17	0.17	1.00								
d.) Price guide	0.46	-0.04	0.11	-0.33	-0.38	0.42	-0.02	0.32	0.30	0.47	0.22	-0.32	-0.28	0.09	-0.27	-0.02	-0.04	1.00							
e.) Contact information	0.06	-0.16	0.07	-0.12	0.09	0.21	-0.12	0.19	0.15	-0.20	-0.03	-0.15	-0.20	0.07	0.00	0.24	0.09	0.11	1.00						
f.) On-line reservation	0.06	0.10	0.19	-0.30	-0.16	0.43	-0.13	0.10	-0.09	0.28	0.01	-0.24	-0.07	-0.03	0.12	0.16	-0.20	0.10	0.04	1.00					
a.) Musical	-0.13	0.20	0.06	0.05	-0.05	-0.29	-0.09	0.16	0.17	-0.02	0.17	0.42	0.17	-0.01	0.00	-0.04	0.15	-0.12	-0.36	-0.12	1.00				
b.) Folklore	-0.44	0.17	-0.32	0.20	0.02	-0.65	0.08	-0.18	0.01	-0.33	-0.22	0.69	0.31	0.04	0.17	0.01	0.18	-0.57	-0.37	-0.18	0.50	1.00			
c.) Theatre	-0.22	0.06	-0.08	0.15	0.27	-0.25	0.13	0.09	0.14	-0.32	0.02	0.28	0.06	-0.30	-0.13	-0.19	0.42	-0.19	0.10	-0.47	0.38	0.15	1.00		
d.) Golf	0.23	0.14	0.05	0.25	0.16	-0.25	-0.07	-0.06	-0.04	-0.37	-0.05	0.01	0.27	-0.12	0.04	-0.24	-0.17	0.07	0.05	-0.34	-0.15	-0.17	0.18	1.00	
e.) Boating	-0.16	-0.15	-0.33	-0.03	0.21	0.23	-0.04	-0.02	-0.17	0.30	0.31	-0.06	-0.02	-0.11	0.34	0.23	0.09	0.02	0.22	0.34	-0.24	-0.13	-0.21	-0.28	1.00

Figure 1. Importance of Portal Functionality (mean)



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