User Profile, Perception, and Behavioral Characteristics of Web-Based GIS in Tourism Information Search

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ABSTRACT

Among the Internet applications, Web-based spatial data service (WebGIS), e.g. Google Maps, Yahoo Maps, and GlobeXplore, has promised a new generation of information platforms and expanded the ways in which travel information can be accessed. However, we know little about the population who seeks tourism and recreation information through WebGIS. Therefore, the purpose of this study is to investigate tourism-information seekers' characteristics and their use behaviors associated with tourism situations when utilizing WebGIS. An electronic self-administered survey was developed as the study instrument. ANOVA was employed to conduct analyses. Sex showed to be influential in information search behavior. The factor of age differentiated the behavior and perceptions toward WebGIS in a wide spectrum in comparison to other factors. In general, education as a factor showed differences in motive and the area of interests. The factor of income levels showed little influence in the attitude and preferences.

Keywords: *Tourism information search, WebGIS, Spatial information, eTourism, Online marketing*

INTRODUCTION

As the Internet has become increasingly accessible, how consumers seek tourism information has shifted dramatically over the years. Among the Internet applications, Web-based spatial data service (WebGIS), e.g. Google Maps, Yahoo Maps, and GlobeXplore, has promised a new generation of information channel and expanded the ways in which travel information can be accessed. WebGIS services have become vital means to convey information and knowledge to the public, especially in the tourism industry (Luo, Feng, and Cai 2005; Spink, Wolfram, Jansen, and Saracevic 2001). These current developments in information communication have affected the field in a wide spectrum.

According to Jansen, Ciamacca, and Spink (2008), in terms of travel information searching on the Web, geographic information accounted for nearly half of all tourism related search queries. Spatial information searching is an effective strategy to reduce uncertainty and risk, as well as to enhance the quality of a prospective experience (Jang 2004). WebGIS provides both tourism sectors and tourists with various benefits including the unlimited access to spatial

data, independent time and space, advanced cartographic components (e.g., multimedia), and the ability to tailor information through interactivity (Dickmann 2005).

The use of geo-information has changed considerably since the studies in the mid 1990s in terms of the range of users, tasks performed, and perceptions (Haklay and Zafiri 2008); however, the changes have been neglected in more contemporary research. Due to the lack of research, we know little about the population who seeks tourism information through WebGIS (Download.com 2008; Kraak and Brown 2000; Peterson 2001), their attitude, and behavior. This lack of understanding has resulted in an information deficiency for tourism agencies that implement the web-based spatial service and need to ensure that the service is effective, efficient, and enjoyable (Haklay and Zafiri 2008). Therefore, the purpose of this study is to delineate the tourism-information seekers' demographic characteristics, perceptions toward WebGIS, and their use behaviors under different tourism situations.

LITERATURE

Based on ComScore Network's recent estimations, in May 2005, MapQuest.com served 43.7 million U.S. visitors, Yahoo Maps served 20.2 million users, and Google Maps served 4.68 million visitors. In the UK, MapQuest claimed that it had over 40 million unique visitors monthly in 2007. The data presented above indicated that Web-based spatial data has a massive audience and keeps being disseminated to people's everyday life. As a result of the popularity of the Internet, much more growth of Web-based Geo-spatial service is expected. Therefore, it is becoming more pressing to know more about who is using what kind of WebGIS services. What differences in perceptional and behavior characteristics exist among different user profile? Under the situation that user profiles have been more and more diversified, knowing users' characteristics, their tasks, and preferences is crucial to provide effective WebGIS (Jokela, Iivari, Matero, and Karukka 2006; van Elzakker 2000; Williams and Lafrenière 2005).

The change of the Internet users' characteristics has been stated. Van Elzakker (2000) identified users of the Internet as relatively young, well educated with interests in science, technology, and possession of a personal computer. However, Wellman and Haythornthwaite (2002) argued that the profile has changed rapidly. Peterson (1997) indicated that for people who planned to connect to the Internet in their households, half of them had high school educations or less. In 1999, about half of the users were females and twenty percent of users were over fifty years old (van Elzakker 2000). Studies have found that personal demographics, such as age, sex, education, nationality, occupation, and income have significant influences on tourism information search behavior (Fodness and Murry 1997; Grønflaten 2008).

Therefore, to better deliver WbGIS services, it is essential to identify different needs and preferences of user groups (Nielsen 1992). Although user demographics significantly reflect user perception and behavior that result in different requirements for the needs of flexibility to tailor geo-information systems for specified user groups, studies were scarce on examining the factors that influence geo-spatial tourism information.

METHOD

Study survey

An electronic self-administered survey was developed to collect data. Electronic survey is a suitable method to reach the population who has access to the Internet, particularly for a study that focuses on the Internet as a channel of information delivery. The development of the instrument was completed in five stages: (1) preliminary developments; (2) Delphi studies; (3) questionnaire improvements; (4) pilot study; (5) reliability, validity testing, and questionnaire improvements. The final survey consists of four parts: the perception dimension, functionality interactions, tourism attributes, and demographics. Items were measured in a five level Likert scale. The perception dimension includes three constructs of TAM (Technology Acceptance Model): 'perceived usefulness', 'perceived easiness', and 'perceived playfulness'. The Interaction dimension lists WebGIS functions from basic to advance to measure the interactions between users and WebGIS interfaces. The dimension of tourism attributes have five constructs, including 'trip preparation stages', 'experience phases', 'trip modes', 'service seeking motives', and 'service seeking tasks'. Finally, the demographics include sex, age, education, and income level.

Subjects

The investigator used multiple e-mail lists to recruit study subjects. Email lists were provided by a mid-west University and two leading recreation and tourism organizations in the state. The subjects include public and commercial recreation and tourism professionals and randomly drawn college students who are likely to use the Internet constantly, representing a good fit considering the components of web applications in this study. The sample size in this study was 1,346 in total consisting of 346 provided by two leading recreation and tourism sectors in the state and 1,000 randomly selected college student emails.

Data collection

This current study adopted a self-administered electronic mail survey method without incentives offered. The data collection process concluded after sending the total of three e-mails, and the process of data collection was approximately 22 days. In sum, the number of valid completed survey was 155. With a valid sample size of 1,265, the overall return rate was 12.5%.

Data analysis

The Statistical Package for Social Science (SPSS) version 16.0 was used in the data analysis process. The analyses employed a one-way between subjects ANOVA to compare groups by demographic variables. The ANOVA assumptions were validated to ensure eligibility of the analytic technique. Depending upon the conditions of the data distribution of each group, either the pair of ANOVA/Tukey HSD analyses or Welch/Games-Howell analyses were used to perform the evaluation.

RESULTS AND CONCLUSION

The perceptions and behaviors on utilizing tourism WebGIS showed significant variations by different demographic groups. First, sex was a significant factor that differentiates the search behavior by tourism situations. Male showed greater usage at the recollection phase in their experiences, sought more terrain knowledge, and needed better geo-information for outdoor recreation than did female. In addition, male showed more usage in searching recreation and tourism information for local and natural areas and utilized more aerial photographs than did female. These results may indicate the differences in searching criteria and strategies applied, as well as the rooted differences in tourism preferences between male and female (Gilbert and Hudson 2000; Hudson 2000; Lefrancois, Leclerc, and Poulin 1997; Shaw 1994). However, female and male respondents showed parallel levels of adoption of WebGIS in this study. Without specifying the recreation situation, male and female perceived similarly in terms of the senses of usefulness, ease of use, and playfulness toward WebGIS.

In this study, the effect of the personal income levels was not as influential in comparison to the results of general information search. This inconsistency may have resulted from the lesser monetary cost of the Internet search when compared to other forms of information search, which may cost more because of such fees as telephone charges and buying magazines (Gursoy and McCleary 2004).

The factor of age impacted on more variables in all three dimensions including perception, tourism situation, and behavior than other demographic variables. The results of age as an influential factor were supported by the earlier studies (Gitelson and Crompton, 1983; Fesenmaier and Vogt 1992), but not later ones (Lo et al 2002; Luo et al 2004). These findings suggested that although gathering tourism information using WebGIS have been commonly used, age is still an influential factor that divide perception, preference, and usage. Age affected greater in acceptance level and usage in different tourism situations. With the exception of the 'preparation stages' and 'service seeking tasks', age groups showed differences in acceptance constructs and in trip situations. In addition, age 45 appeared to be the age that divided the use behavior including acceptance levels, experience stages, trip modes, and the usages of geo-information types.

The effects of the education were better supported by results of earlier studies (Fesenmaier and Vogt 1992; Dodd 1998) than by recent literature (Lo et al 2002; Luo et al 2004). Within this study context, education levels distinguished the preference in 'customization' variable, in which the users put their effort into organizing and/or creating different types of geo-information for a specific trip. This task usually requires more effort than retrieving information directly from the predetermined defaults. In addition, people with higher education showed a greater usage in searching geo-information on natural areas. This result was supported by the findings of previous studies (Brau 1993; Liere and Dunlap 1980; Shen and Saijo 2007). However, there was not enough information to identify the purposes and how people with higher education use the geo-information of natural areas.

With the goals to reach a greater potential population and actively promote tourism industry, the information obtained in this study may assist the industry with sufficient tools to decide priorities and select appropriate geo-spatial services. The characteristics of the usages, trip

situations, and perceptions toward WebGIS can be identifiable with the corresponding demographic factors. The considerations of the attitudes, preferences, and information needs of the targeted audiences are necessary to facilitate a successful service and effective investment on the internet application of WebGIS, an information platform that has the ability to promote tourism industry by offering rich and interactive functionality with highly visualized nature and informative characteristics.

REFERENCES

Brau, M. N. (1993). The influence of educational level on participation in outdoor recreation. *Public Opinion Quarterly 44*, 181-197.

Dickmann, F. (2005). Effectiveness and efficiency of tourism maps in the World Wide Web and their potential for mobile map services. In L. Meng, A. Zipf & S. Winter (Eds.), *Map-based mobile services: theories, methods and implementations*. Heidelberg: Springer.

Dodd, T., & Bigotte, V. (1997). Perceptual differences among visitor groups to wineries. *Journal of Travel Research, 35*(3), 46-51.

Download.com. (2008). Google Earth version 4.3 downloads Retrieved 08/10, 2008, from http://www.download.com/1770-2001_4-0.html?query=google+earth+&tag=srch&searchtype=downloads

Kraak, M. J., & Brown, A. (2000). *Web cartography: Developments and prospects*. London: Taylor and Francis.

Fodness, D., & Murry, B. (1997). Tourist information search. *Annals of Tourism Research, 24*(3), 503–523.

Gitelson, R. J., & Crompton, J. L. (1983). The planning horizons and sources of information used by pleasure vacationers. *Journal of Travel Research, 21*(3), 2-7.

Grønflaten, Ø. (2008). Factors influencing traveler's choice of information search strategies: an exploratory study. Paper presented at the 18th Annual Council for Australian University Tourism and Hospitality Education (CAUTHE) conference, Queensland, Australia.

Gursoy, D., & McCleary, K. W. (2004). An integrative model of tourists' information search behavior. *Annals of Tourism Research, 31*(2), 353-373.

Haklay, M., & Zafiri, A. (2008). Usability engineering for GIS: Learning from a screenshot. *The Cartographic Journal, 45*(2), 87-97.

Jang, S. (2004). The past, present, and future research of online information search. Journal of *Travel & Tourism Marketing, 17*(2), 41-47.

Jansen, B. J., Ciamacca, C. C., & Spink, A. (2008). An analysis of travel searching on the Web. *Journal of Information Technology and Tourism, 10*(2), 101-118.

Lefrancois, R., Leclerc, G., & Poulin, N. (1997). Predictors of activity involvement among older adults. *Activities, Adaptation & Aging, 22*(4), 15-29.

Lo, A., Cheung, C., & Law, R. (2002). Information search behavior of Hong Kong's inbound travelers– A comparison of business and leisure travelers. *Journal of Travel & Tourism Marketing, 13*(3), 61-81.

Luo, M., Feng, R., & Cai, L. A. (2004). Information search behavior and tourist characteristics: The Internet vis-a-vis other information sources. *Journal of Travel & Tourism Marketing, 17*(2 & 3), 15-25.

Pavlou, P. A. (2003). Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model. *International Journal of Electronic Commerce, 7*(3), 101-134.

Peterson, M. P. (2001). Chapter 3: Maps on the Web. In W. Cartwright (Ed.), *Maps and the Internet* (pp. 88-102). London: Library Association Publishing.

Shaw, S. M. (1994). Gender, leisure, and constraint: towards a framework for the analysis of women's leisure. *Journal of Leisure Research, 26*(1), 8-23.

Shen, J., & Saijo, T. (2007). *The social determinants of individual environmental concern: Evidence from Shanghai data*. Osaka, Japan: Osaka School of International Public Policy, Osaka University.

Spink, A., Wolfram, D., Jansen, B. J., & Saracevic, T. (2001). Searching the Web: The public and their queries. *Journal of the American Society for Information Science and Technology, 52*(3), 226-234.

Wellman, B., & Haythornthwaite, C. A. (2002). *The Internet in everyday life*. Maiden, MA: Blackwell Publishing.