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Abstract

The geographic distribution of current and potential customers is a major decision variable in tourism marketing. These distributions are most effectively modeled via the spatial analytic and visualization capabilities of a Geographic Information System (GIS). However, many businesses are not able to capitalize on these systems due to their complexity and/or expense. In these cases, a marketing decision support tool is needed which will allow the tourism industry and research community to capitalize on the value of GIS. This study explores the use of an open source web mapping system and a corresponding data structure to address this application gap. A customized web mapping application gives every user the ability to easily capture, display, augment and manipulate his/her own consumer related data to identify patterns and generate new hypotheses that could significantly improve their marketing analysis process.

Keywords: *Tourism Marketing, GIS, Web Delivery*

Extended Abstract

Competing for new customers, while retaining the current ones, is a priority for all tourism operations regardless of size, industry or ownership. Particularly in times of economic uncertainty, it is imperative that tourism entrepreneurs make prudent marketing choices regarding their products and services. A major decision variable in predicting the effectiveness of marketing and other investment initiatives is the geographic distribution of current and potential customers. These distributions are most effectively modeled via the spatial analytic and visualization capabilities of a Geographic Information System (GIS). However, many businesses are not able to capitalize on these systems due to the complexity and expense of the GIS software. When proprietary options are unavailable, a marketing decision support tool is needed which will allow the tourism industry and research community to capitalize on the value of GIS.

This study explores the use of an open source web mapping system and a corresponding data structure to address this application gap.

Tourism planning and management is a field that can benefit from a GIS's ability to aid in decision-making tasks (McAdam 1999). Given the proper input, a GIS has the capability to effectively display past, current and potential future situations that can enable planners or researchers to elucidate trends and plan for the future. Chancellor and Cole (2008) state that GIS allows for identification of the spatial relationships between tourists' origins and the attractions visited or services used, thereby enabling evaluation and targeting of marketing efforts, customization of visitor packages, development of new opportunities and the discovery of potential collaborative arrangements among partners.

The travel and tourism industry have an advantage over other industries in the context of geodemographic analysis, primarily because most transactions produce a record of the names and addresses (Elliott-White & Finn, 1998). Organizations with customer address or zip codes can use GIS to generate maps to display where their customers live in relation to each other and to their business. This type of analysis can identify customer clusters for additional neighborhood level promotion such as newspapers or billboards (Hess, Rubin, and West 2004). The lack of customers in a given area or neighborhood could indicate a potential new market to target and with the help of a GIS, that potential market can be both spatial and demographically compared to any current high preforming markets.

Despite these virtues, GIS has been slow to catch on in the tourism industry (Chen 2007). Furthermore, there is evidence that suggests GIS has lagged behind other information systems tools in business. Keenan (2005) identifies several factors that have contributed to that lag, including hardware requirements, software complexity, data availability, and user training; however, he acknowledges that due to recent developments in each of these areas, GIS technologies are accessible to more organizations, are increasing their ability to integrate various sources of internal and external data and are able to understand the data more fully through the use of spatial tools. One way these developments have materialized is through the shift in GIS software development away from the large systems, such as ArcGIS or Grass (with hundreds of functions) toward user intuitive spatial information applications (Giuliani 2004; Google Maps). These applications have less functionality than their predecessors; however, they are tailored to specific user needs and consequently are easier to use and deliver. This customization allows novice users to preform only the functions that are critical to their particular industry, thereby removing the complexity of universal applications and greatly reducing their cost. Several examples of these limited but effective systems have been created to handle ecological, natural resource and land assessment problems (Frehner and Brandli 2006; Hall et al. 2010; Kearns, Kelly, and Tuxen 2003). Currently in the field of tourism, such a system has not been described in the literature. The application described here will be an initial contribution on this front.

In addition to being tailored for tourism professionals and researchers, this application is built with an open source software stack and is delivered via the web, providing ease of access for application users as well as allowing for future expansion to mobile devices. Managers and researchers can upload client lists or transactional data (e.g. hotel stays), which are then quickly processed and returned as spatial frequency maps where the geometric boundary for each zip

code is symbolized by color to represent the number of corresponding transactions or clients, thereby informing the user about client concentration as well as the distances those clients are willing to travel. These spatial displays when combined with geographically matched demographic, socioeconomic and consumer behavior data allow for the development of new customer response models and analyses. Marketing initiatives can be both prepared and evaluated; for evaluation, users can determine if current marketing efforts are producing positive results or falling short of desired goals.

Customization and web delivery are made possible by employing an open source software stack including a spatial database management system (PostGIS for PostgreSQL), a web map server (Geoserver) and web map application interface software for displaying and manipulating the data on the web site (GeoExplorer API). The open source implementation design makes the application readily customizable and expandable as new lines of inquiry and management models emerge. The map interface includes standard web mapping options such as zoom and pan as well as specialty tools such as print, measure and information. To demonstrate the application's effectiveness, a case study for a summer camp consortium will be presented.

The type of spatial analysis technique employed by the application is not novel; however, there are advantages in ease of use, delivery and accessibility. Sophisticated proprietary software can perform comparable spatial analysis, but usually they require recurring licensing fees and proper training or operational knowledge to insure trustworthy analytic results. Alternatively, many for profit organizations offer marketing services which include geospatial investigation of clientele. Because these options are unavailable or too expensive for some businesses and researchers, there needs to be a reasonable alternative. This alternative has arrived as the open source software movement, which is putting powerful tools in the hands of many, giving a much needed option to pricy proprietary products. Although this tool was designed for tourism professionals and researchers, this application can be useful to anyone interested in spatial frequency analysis of their customers. The significant contribution of this work is that this open source application can give any user the ability to easily capture, display, augment and manipulate consumer related data to identify patterns and generate new hypotheses that could significantly improve their marketing analysis process.

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