

Evaluation of Multi Layers Web-based GIS Approach in Retrieving Tourist Related Information

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Abstract: Geo-based information is getting greater importance among tourists. However, retrieving this information on the web depends heavily on the methods of dissemination. Therefore, this study intends to evaluate methods used in disseminating tourist related geo-based information on the web using partial match query, firstly, in default system which is a single layer approach and secondly, using multi layer web-based Geographic Information System (GIS) approaches. Shah Alam tourist related data are used as a test collection and are stored in a map server. Query keyword is tested using both default and multi layer systems and results are evaluated using experiments on sample data. Precision and recall are the performance measurement technique used. Findings show that multi layer web-based GIS provide enhanced capability in retrieving tourist related information as compared to default system. Therefore, in the future, web-based GIS development should utilize multi layers approach instead of the single layer method in disseminating geo-based information to users.

Keywords: Precision and recall, tourist information search, web-based geographic information system

INTRODUCTION

Geo-based information is gaining greater importance among tourists as it allows meaningful experience with places (Achatschitz, 2006; Tussyadiah and Zach, 2012). Furthermore, the use of geo-based information is not limited to tourists but it is also used in everyday life. Acquisition of this information through the use Information and Communication Technology (ICT) has effect on everyone especially tourists. Publishing web-based Geographic Information System (GIS) maps is one of the methods used to encourage the public to acquire geo-based information using ICT. Development of geoportals that is more receptive towards tourists' requests has become abundant today (Dickinger *et al.*, 2008; Sigala, 2009). However, the current online maps which run on a web-based GIS do not reflect users' needs (Khan and Adnan, 2010; Kyem and Saku, 2009; Plosker, 2006; Richmond, 2002). These maps need to be improved not only in terms of usability as discussed in Khan and Adnan (2010) but also in terms of their efficiency and effectiveness (Dickinger *et al.*, 2008; Kyem and Saku, 2009; Pan and Fesenmaier, 2006a; Plosker, 2006).

Currently, researches are either focus on usability of web-based GIS applications (Khan and Adnan, 2010; Radwan, 2005; Voldán, 2010; You *et al.*, 2007),

visualization (Pontikakis and Twaroch, 2006), geoportal collaborations (Hao *et al.*, 2010; Sigala, 2009), shortest path (Hochmair, 2009), map related information search (Chen *et al.*, 1998) or Geographic Information Retrieval (GIR) technique and performance (Pu *et al.*, 2009). Little concern is given in evaluating the performance of the current web-based GIS applications (Markowetz *et al.*, 2004; Matic, 2006; Simão *et al.*, 2009). In addition, the current off the shelf web-based GIS products have further encouraged users to use the applications without giving thoughts to the current system's performance (Plewe, 1997; Tsou, 2004; Tsou and Michael, 2003). The integration of GIR component in web-based GIS has given initial thoughts in evaluating the performance of the latter system (Larson, 1996; Martins *et al.*, 2005; Purves and Jones, 2006; Voldán, 2010; Zhang *et al.*, 2012). As a result, GIR evaluation technique can be used to evaluate the performance of web-based GIS (Clough *et al.*, 2006; Martins *et al.*, 2005). Therefore, this study intends to evaluate the performance of web-based GIS in disseminating tourist related geo-based information on the web. Two systems are evaluated. First is the single layer system which is provided by the current off the shelf web-based GIS developer. The other is a customized multi layers system. Both are evaluated and results are presented.

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