Potential of Geospatial Mashups in Promoting Tourism Resources: A Case Study

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Abstract

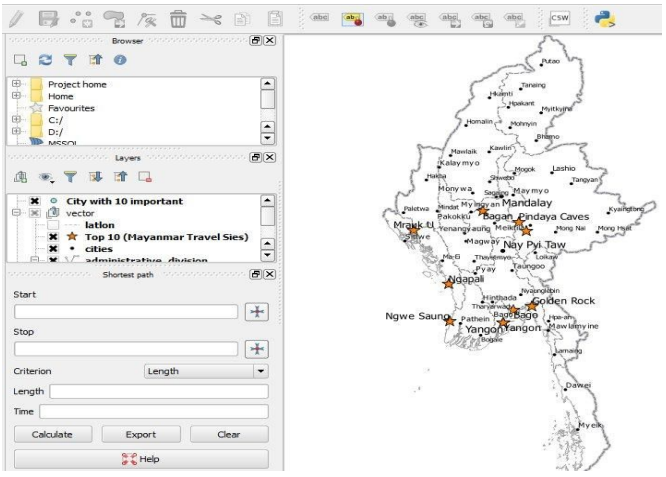
Tourism is playing a vital role in alternative and sustainable socio-economic development. Like any other modern industries, this service industry is also incorporating Geographical Information System (GIS) in almost every step of their operation. Southeast Asian countries are enriched in diverse culture, locations and heritage. But many potential tourist sites of this region are still not integrated into the global tourism map. One of the main reasons for it is the lack of available online information. To analyze the existing geospatial information and the tourist inflow of the region, a case study was conducted in the Republic of Myanmar, a potential tourism site in South East Asia. This research project further discusses the basic architecture and the competences of Geospatial Mashups in identifying potential tourism resources and assisting in effective decision making. A Public Participation Geospatial model and its strategic implementation for effective tourism management and promotion have been proposed in the concluding section of the current study. QGIS Desktop 2.10.1 software has been used to analyze existing tourism data.

Keywords: Tourism, GIS, Geospatial Mashups, Public Participation Geospatial model, QGIS

1 INTRODUCTION

Republic of the Union of Myanmar is one of the developing nations in south-east Asia. It has an area of 676,577 square km, extending 1,931 km in the North-South and 925 km in the East-West. Myanmar has a wide range of natural diversity; the snow-capped mountain in Putao, Inle Lake in the Shan state, Ngapali beach located in Rakhine state, Mergui Archipelago consists of 800 islands located in the southern part of Myanmar. Beside these, the country has the charming capital city of Yangon, the temple city of Bagan, the cave housing in Pindaya, the Golden Rock in Mon state and many more (Chaudhuri et al., 2015). Top ten popular tourist destinations of Myanmar (Inle lake, Shwedagon Pagoda, Golden Rock, Bagan, Bago, Yangon, Ngapali, Mrauk U, Pindaya Caves and Ngwe Saung) along with nearly 50 important cities are

depicted in the map (figure 1). The map has been designed using open source cross-platform GIS software, Quantum GIS (QGIS). This software helps in integrating and analysis of heterogeneous geo-referenced data.

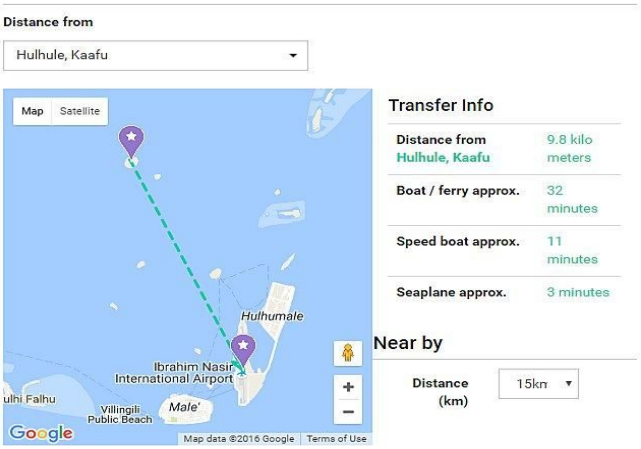


Source: Designed using QGIS Desktop 2.10.1

Figure 1: Map of Myanmar: Important cities and top ten tourist locations

2 GEOSPATIAL MASHUPS

In context to Web GIS, a Mashup is the process of merging multiple sources of data, both spatial and non-spatial, into a single integrated spatial display. It is about extracting spatial data from a non-spatial source and combining with other spatial data and finally displaying it on a map (Ray et al., But just embedding a video or an image on a web page is not a Mashup. The factual Mashup technology allows the contributor to host, update, customize and maintain global data without having any constraints. The basic architecture of Web GIS consists of two application layers, server end and client or browser end. The mode of operation for both client-side and browser-side Mashup is same. In both the cases, the Web browser sends requests to different services, receives the responses and displays the desired composite results. The advantage of server-side Mashups over the client-side is that the server has the capability of using more powerful hardware and software than the browser. The common georeferenced Mashup design consists of three components: Basemaps, Operational Layers and Tools. One example is Eatolls.com (under process) provides Geospatial information in an interactive map interface. Figure 2 (below) depicts the query result of sea route information for a particular resort from the International airport of Maldives.



Source: www.eatolls.com (2017)

Figure 2: Directional Information by Geo-tagged Website

3 MYANMAR GEOSPATIAL INFORMATION SYSTEM FOR TOURISM

According to Singh et al. (2011), GIS and tourism share a common characteristic, both cross the boundaries and areas of application. Geospatial Mashup has significant impact tourism information (Singh et al., 2011).

A. System Architecture

The proposed, "Myanmar Geospatial Information System for Tourism" (MGIST) is a client-side Mashup application following typical three-tier (view layer, logical layer and physical layer) architecture. The system has customized three levels of users. Each level of users has different levels of data accessibility and customization functions. Figure 3 (below) illustrates the different levels of users with their respective functionalities.

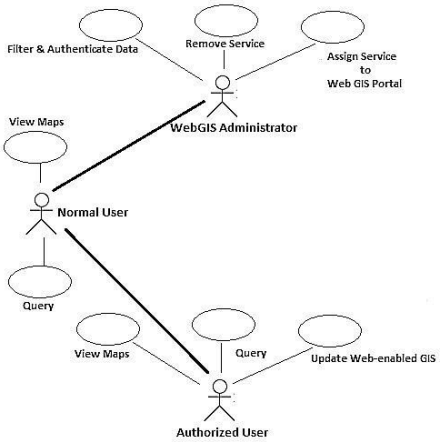


Figure 3: Use Case diagram for the proposed model

The primary focus in the process of Georeferenced Mashup development is on the user friendliness and the on-click availability of diverse global geo information in a common base map. So that anyone can share their local geospatial information in an online interactive common platform.

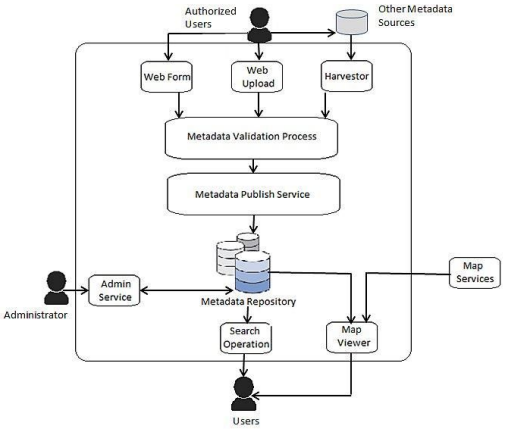


Figure 4: Schematic Model of MGIST

Open Geospatial Consortium (OGC) web service provides a vendor-independent interactive framework for web-based capturing, storing, and editing, analyzing and projecting geospatial data. Web Feature Service (WFS) and Web Map Service (WMS) are the two most important web service standards proposed by Open Geospatial Consortium, 2002. Figure 4 (above) depicts the workflow sequence for the proposed MGIST. It follows OGC service. A series of "decision making ratings" will be used as the assessment criteria to study the characteristics of the destination and its potentiality to be a popular tourism site. The authorized users' web upload criteria and indicators will be revised suitably, so that the information sought may be cross checked in the administrator level. This series of "decision making ratings" will allow studying the relationship between the characteristics of the destination and its potentiality to be a popular tourism destination.

B. Interface Design

The proposed model will have the following features:

- Basic home page
    - Filter by regions
- Display Mashup maps with user-controlled selected features of each location (Landmarks, Historical Sites, Beach, Food Places, Hotels etc.). Multimedia based information will pop up on click.
- Filter places based on user preference
- Find direction and shortest distance between two locations.
- Information about the place (Aggregation of the results will be displayed to others)

- Provide ratings to places
- Comment your experience

- Recommend or, create new and undiscovered potential tourist locations
- Update information about a location
- Administrator dashboard.
- Feedbacks and other inquiries- A help desk to improve the system.

C. System Components

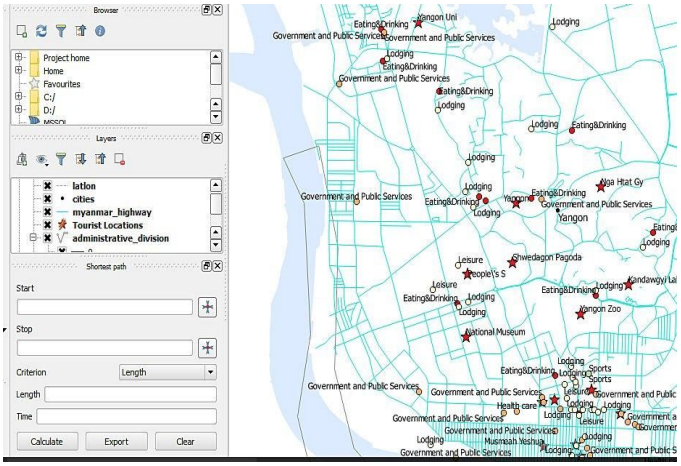
MGIST consists of five different component programs:

- QGIS as OGC Data Server (Open Source)
  Compatible with Apache web server and having Python plugin support.

- PostGIS 2.0 Database spatial enable support
  Dynamically updating layers in QGIS with PostGIS views.

- MGIST application designed using PHP

Scripts (Hypertext Pre-processor) and Ajax. The user interface consists of a series of ".php" files which are rendered to the browser using Hypertext Mark-up Language (HTML). The Web application uses client-side scripts, i.e. it uses JQuery and JavaScript's files to execute instructions on the Web page.



Source: Designed using QGIS Desktop 2.10.1

Fig. 5 Mashup Map of Yangon (Server Side)

4 CONCLUSION

The available Myanmar tourism related information are static and solely dependent on the maintenance and update by the proprietors of the individual websites. The proposed "Myanmar Geospatial Information System for Tourism" (MGIST) will be *"Information by the People for the People"* and can be easily uploaded on web to respond to the potential tourist's query. It combines two important approaches. MGIST offers the common platform to publish proprietary data and use related metadata. It

also helps in combining heterogeneous data from different sources and offers easy integration and reuse of user derived information sources like: Google Earth or, Open Street Map. The greatest advantage in this Participatory Mashups is that, the globally accessible Geo -Mashups contain the most recent information about the location. Even the tourists while travelling can update the Mashup information over the internet. This will be beneficial for other potential tourists. Data update and maintenance will not be the sole responsibility of any single organization. People will be able to share multimedia based information in this georeferenced platform, authenticated by some administrator. Thus it will help potential tourist from any part of the globe to access most up to date information in a user-friendly geospatial information system.

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