

The Digital Map Iconography in Assisting of Create the Tourism Circuits

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ABSTRACT

The icon or marker on the map represents tourist attraction sites shown with a standardized iconography. This study aims to evaluate the iconography that is used on virtual tourism maps, and to discover a method for building up tourism circuits. It is based on the concept that a circuit can attract a tourist who enters it, and the tourist will then visit all the announced places in the circuit. This strategy can increase the total number of visits to a circuit, and increase attraction to all the tourist destinations on a circuit. Thailand's tourism web sites were observed and it has been discovered that there is no rule for standard icons, nor is there a tourism circuit matching this concept. This study finds that a tour circuit can be created manually or can be standardized by using Java script on Google map and the icons are suggested by World Tourism Organization (UNWTO).

Keywords: Map iconography, Iconography, Tourism circuit

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Introduction

The digital map is an innovation of the cartography, which became an important part of the human history. Since human discovered how to build it, they have used it as tools to define, explain, declare, and navigate, using the image that represents the geographic and object on the earth. It is incredible that the primal known maps recorded about the stars. The primitive man did cave painting and rock-caving with simple images to help them recognize the features of an area of land, such as the place of their resident, hill, river, valley, and route. In the later era, the information about the geographical knowledge and color on icon, symbol and text has been applied on the map ("History of cartography," n.d.). In the new age, maps are printed on new material that is portable, durable, and flexible; e.g., paper and plastic. The printed map displays all or part of the earth in flat surface. It represents the true distance, true direction, true area and true shape of the earth in a specific smaller-scale. The map size and scale have limited to the world map crop area. Thus, it cannot show all these features on the same map. Only the selected information comprises about the map area relate to cost of the map production. In addition, some features in small scale cannot be illustrated on the map. The symbol, icon and color are applied to represent and classified into different features on the map. To use the map, it is necessary to know how to find and interpret these symbols or icons existing on the map. The printed map was published on the latest date with accurate information in the production period. For this reason, the map information is static and it can become out-of-date after published. However, the printed map is simple with a wide range of usage. Although the information on the map is not up to date, it is still useful to find and compare its information on the new map to show the land use change. It additionally stores memory of some buildings or places existed in the history of certain locations or towns. Artistic design was used on purpose in some maps in order to show objects on the earth with colors and symbols that are easy to recognize. Even though it is less accurate, it can be understandable such as the map of tour guide. The computerization increases the potential and capability to transform an ordinary map into a digital map. In 1989, the word of Geographic Information System (GIS and Spatial Analysis was announced by the National Center for Geographic Information and Analysis (NCGIA). The GIS are used as tools for storing, retrieving and displaying geographic information. The map and data are transformed into digital format which is available to work on the computer. The application such as ARC/INFO is used for developing a user interface facilitating between the user and the system, and the transition between data and processes that conduct the output (Rogerson & Fortheringham, 1994). The roles of digital map are not only helping users to recognize and navigate the place existing on Earth, but also enabling users to conduct the statistical and analytical result from the collected data. The advantages of digital maps over the traditional printed or analog maps are from the new technology and the availability to introduce and explore it through the Internet network. New technology of GIS applies the digital map in a variety of applications using for everyday life, global environmental monitoring, land use trackbacks and forecast, agricultural field, science, the military and business, etc. The map has two basic types; Topography map and Thematic map. Topography map refers as the shape of the surface. It represents by the shading and/or contouring and including the other main features such as roads, trails, building, boundaries, railways, rivers, mountains, etc. Thematic map consists of two essential

elements; a base map and statistical data. It displays information related to a specific data set or some locations; e.g. population density, average income ("Thematic map," ; "Topographic Maps (Topo Maps) and Contour Lines Introduction," ; "UNIT 2 - MAPS AND MAP ANALYSIS,"). The digital map has advantage features that can solve some constrain found in printed maps such as accessible and shareable online, quicker process, easy to update through the network and generate the widespread use and applicable to vast innovative project.

To develop a tourism map on the web, one of the most important things to concern is an iconology that can represent the appropriate meaning of the tourist destination. Iconography uses on the map as a representative depiction of a recognizable and meaning of the subject (" Definition of ICONOGRAPHY," ; " Iconography - Wikipedia," ; *Tourism and Social Identities: Global Frameworks and Local Realities*, 2006). Iconography is an image or symbol that conveys the meaning of the content of the map as well as the ideograms and hieroglyphs used by the ancient Chinese and Egyptian. The map maker defines the symbol, icon or marker for general uses on the digital map to represent the location, object, activity, weather, traffic sign and route, or event at the specific location on the earth's surface. The digital tourism map applies only a subset of these signs and symbols. These signs and symbols are related to the 3A's of a tourism component. The 3A's of tourism is the attraction point, the transportation or accessibility, and the amenities of the tourist. The sign and symbol should have a general clear meaning and simple language (Jittangwattana & Sukleang, 2006; UNWTO, 2001). However, the signs and symbols are contained in the separate digital map layer such as terrain, traffic or street, tourism site, and a custom layer. The map makers, such as Google Maps, Microsoft Bing, MapQuest, etc. has already provided the basic map layers for instance; traffic, transit, bicycling, satellite, and terrain. Most of these applications also enable the developer to create a new custom layer. The colors and symbols are included on the map to define the common usage. ("View traffic, satellite, terrain, biking, and transit - Computer - Google Maps Help,"). The iconography in some maps layer is called icon or marker defining the thing or place on a map that correlates to the real earth surface. Google Maps define a marker as the image that identifies an object on a map. Usually, a marker uses a Google Maps' standard image when the icon is the custom image ("Markers | Google Maps JavaScript API | Google Developers,"). The icon or marker is used to identify an object which can be found from certain websites or from the menu that the map maker prepares in their tools. For example, the Map Channels website offers 91 markers and shadow images for general use with Google Maps and 21 markers and shadows for Street views("Map Channels: Official Google My Maps Marker Set," 2007), The Map Icon Collection website offers 1000 free and customizable icons to use as Point of Interest POI on the maps with selectable categories("Map Icons Collection - 1000+ free & customizable icons for maps,"), the World Tourism Organization (UNWTO) also offers the iconology for tourism map (UNWTO, 2001).

The Thailand tourism agency and government use tourism website as a tool to promote the tourist destinations. Most of them use the map marker or icon to place the tourism's points of interest on the map. Each point has a link to its label, information, picture, movie clip. However, it is sensible that the travelers search on these destinations for their trip planning and they do not want to find only one destination to visit during their vacation. It is difficult to consider all the promotion sites to grouping and planning to cover all appropriate destinations. Since some

information such as distance, transportation, direction, timing, etc. is leaked, it is a better strategy to promote the tourism destination using tourism circuit concept.

Tourism circuit is an alignment of the route of the tourist destinations. The circuit should include at least three major tourist destinations and located in different area within a distance that can be reached by tourists as they continuously cover all of them. The tourism circuit represents of short lengths stay at each destination, pre-plan schedule, and local or national clustering of attractions. It should have a well - defined entry point, the sequence destinations, and the existing points motivating the tourists to visits all identified destinations on the circuit. The objective of creating a tourist circuit is to increase the total number of visits and provide the tourist the attraction of all the destinations located on the circuit (Chowdhary, 2014; Chowdhury, 2011). Google Maps is one of the applications supporting the developers to add, modify, and customize the map by tools, or a simple Java scripts. This enables the developers to create the destination points and tourist circuit as well as clustering or grouping the marker to create the tourism circuit ("Markers | Google Maps JavaScript API | Google Developers,").

Objective of the study

To evaluate the digital map technology and Iconography that enable to assist the creation of tourism circuits.

Methodology

1. Secondary data such as the tourist destination has been collected from the Thai tourism websites especially from the tourist destination database system of Department of Tourism's website. This website is used as a reference tourist destination promoted by the government agency. The iconography is collected by search from the internet, Google maps, other maps applications and UNWTO.

2. The conceptual framework of the study starts from studying the features which offer to create or add the marker on the map especially on Google Maps. It also relates to how to create route between one point of interest to another to create the tourism circuit. The java script to group the marker as clustering them is help to group the nearby marker by distance. Thus, one cluster marker can suggest as a set of destination of one circuit.

3. To create the demonstrate tourism circuit on the tourism area.

Approaches and Methodology used for identification of circuit.

The study uses Google Maps as the tool to demonstrate the method to create the circuit. The sample tourist destinations are placed on the map as a map marker. The UNWTO's tourism iconography is used as the reference because the applicable icons are well defined; most of the icons contained in The UNWTO's tourism iconography cover the objects or activities related to the tourism. For instance, the image used as a marker can be found from the iconography creator website. For example; the waterfall is referred by the image in UNWTO's reference as shown in figure1.

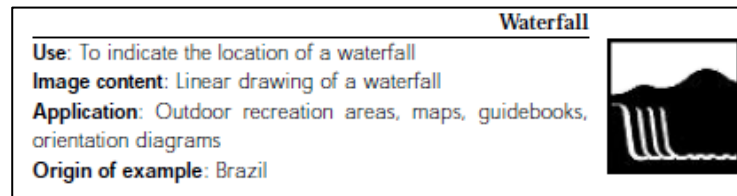


Figure 1 Image of Waterfall iconography from UNWTO



Source: World Tourism Organization

It is better graphic design to use the waterfall icon from the map icons collection website classifying it in the Natural marvels map marker group as shown in figure 2.



Figure 2. The Waterfall icon from the map icon collection

Source: <https://mapicons.mapsmarker.com/category/markers/nature/natural-marvels/>

It should be noted that Google Maps does not support icon that covers objects and activities of tourism. The pin point icon  or  is a general marker for Google map.

The line and the distance calculation can be built it on Google map by Java script that joints between each destination. The driving direction object in Java Script can create route between one maker to another("Developer's Guide | Google Maps Directions API | Google Developers,"). It also produces the geocode way point that can export it in Json format. These geocodes consist of the coordinate marker, distance between them and the estimate travel time. The MarkerClusterer object in Java Script can also group the nearest markers and represent by circular image ("Introduction to Marker Clustering With Google Maps,"). The distance matrix object is applied to create a route that joins all destinations in one circuit ("Distance Matrix Service | Google Maps JavaScript API | Google Developers,").

The steps to create a map circuit are as follows;

1. Place all map markers on the Google maps by manual or Java Scripts.
2. Create the marker cluster by running the MarkerClusterer in Java Script.
3. Create the driving direction by running the driving direction in Java Script.
4. Exported the driving direction in Json format to specify the entry point and exist point and run the Google Maps Distance Matrix in Java Script to create one complete tourism circuit.
5. Create the link of information, photo, movie clip to the marker in the circuit.

Results

The study has found that Google Maps is widely used in many purposes. The Iconography presented by UNWTO still unawareness to the tourism map developers. Since the tourism iconography from UNWTO are cover most of the objects and activities and design to use for tourism. When the Google Maps offers the general-purpose iconology, it has been found that it cannot cover to use with the tourism. The other free icon designer such the map icons collection can use as the marker by referring to the UNWTO iconography as standard iconography for tourism. The Java Script was used to demonstrate how to create the tourism circuit by the step that present above. The demonstrated result can be shown as in following figures.

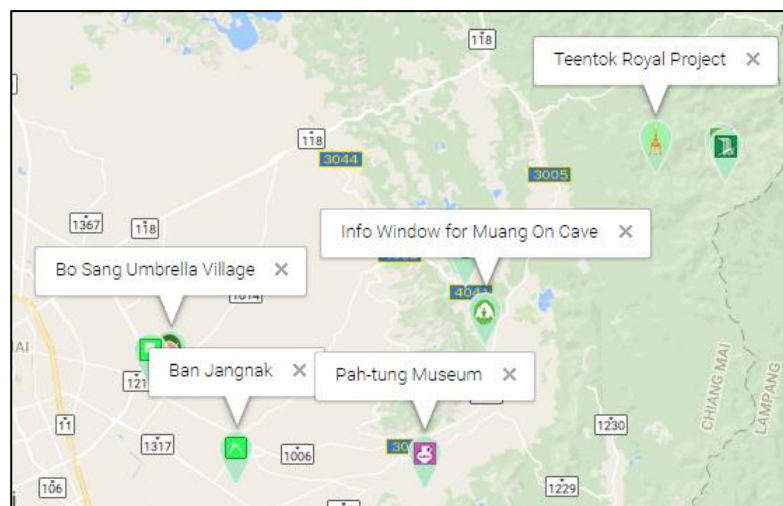



Figure 3 the marker place on Google map

The sample of tourist destination in Chiang Mai, Thailand along with the route 1006 which departs from Muang district to Sankhampaeng district. The tourist destinations are shown in figure 3 which is represented by map marker having an image related to the tourism site. The maker of cave site is represented by  that can be referred from the UNWTO reference as shown in figure 4


Cave	
Use: To indicate the location of a cave	
Image content: Linear drawing of a cave with human figure at the entrance	
Application: Outdoor recreation areas, maps, guidebooks, orientation diagrams	
Origin of example: Brazil	

Figure 4 The icon of cave from UNWTO

These markers can be found the nearest group by MarkerClusterer in Java Script. The result after run the script is three clusters when another two markers could not be grouped with the others regarding to distance between them. The number in the circle shows how many sites exist in each group as shown in figure 5.

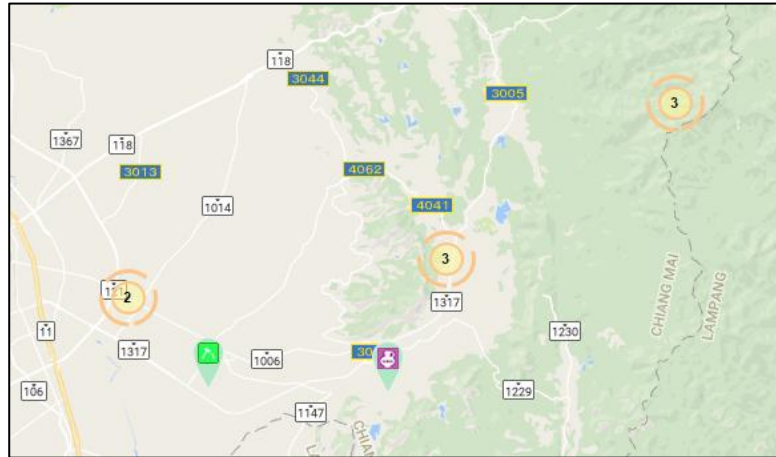


Figure 5 Create Marker Clustering

These clusters of tourist destination can be used to create tourism circuit. For a simple case and demonstrate how to create the circuit. The cluster that has two tourist destination sites as shown in figure 6 was selected.

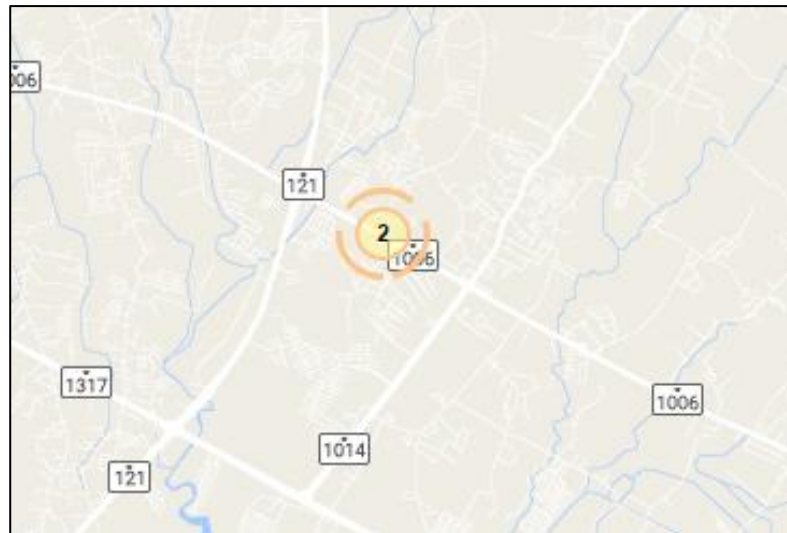


Figure 6 A tourist destination cluster with two members

In this sample cluster, it consists of two tourism sites; Tonpao which is the village of local mulberry paper craft called “Saapaper”, and Bo Sang which is the village of craft umbrella as shows in figure 7. These two sites are very famous in local craft. They are two of the major sites promoted by tourism authority of Thailand. To create a circuit for these two sites, the travel direction is assuming depart from Muang district to Sankhampaeng district. The enter point is set at Tonpao village (A) and point to the next destination Bo Sang village (B). In this case, Bo Sang village is the end- point of the circuit. The route of circuit can be built by Google Maps Distance in java Script. The Google Maps distance can return the calculated distance and traveling time between these two points which can be used as traveling information for the traveler.

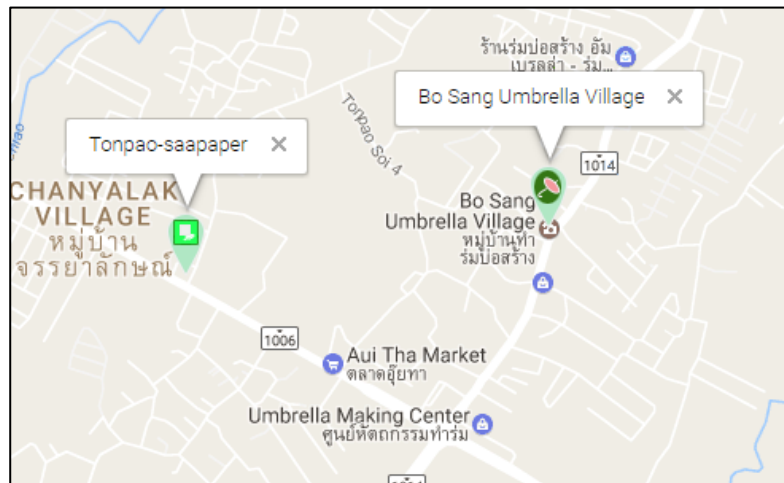


Figure 7 Shows two tourist destinations that exist in the same cluster.

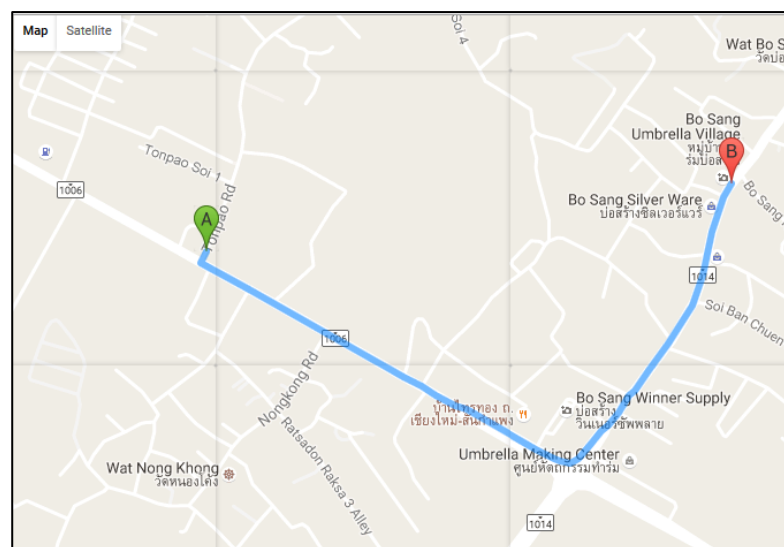


Figure 8 creating the route between destinations

The tourism circuit can use to promote the tourism sites and the way point that can guide the traveler to travel to all sites in tourism circuit.

Discussion and Conclusions

The iconography from UNWTO can be used as a reference to the tourism map developer. This can set up a standard for tourism map as a basic map language for tourism. It is vital to create some icons related to certain places or activities in Thailand as a new icon. Since the matching icon to the UNWTO may not be found, the new icon should have additional details with it. The advantage of promoting the tourism circuit is to arrange the travel guide line and information for the users who search on the map at the destination country to find the tourism sites for their travel plan. In addition, the suggested routes, tourist destination sites, and information can be provided so that tourists can easily make their decision when they find that any circuit given them high profit and satiation. The tourism circuit

can support the idea of the tourism management as a new strategy to increase the number of visits the destination. Moreover, it supports the creation of both international and local tourism development plan.

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