

DATA COLLECTION AND ITS USEFULNESS FOR CREATING DATABASE AND INFORMATION OF HISTORICAL MAP IN THANG LONG - HANOI

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ABSTRACT

This paper discusses the need for study about historical sites and most importance of these in study in Thang Long-Hanoi historical heritage, Hanoi has about 2000 cultural and historical sites among them include 633 site have already raked (500 had national rank) but many sites have not been managed and develop effectively. Combination applications advantage of the Information technology, GIS and Remote Sensing to study historical and cultural of Thang Long-Hanoi. The focus of this paper is the realization of the study historical sites and its applying for create Historical maps including time dimension, and how to use number of the data collections to build up relational database displayed base on 4D Historical map in the future. Also in this paper discusses potential that's number of historical materials can be used information extraction method to extraction requirement information relating with project.

1. INTRODUCTION

This paper research about historical sites which is one of the importances in the project named ThangLong-Hanoi project on Preservation of Historical Heritage and 1000th Anniversary Celebration. This research includes study on historical transfiguration through urban development in Hanoi; Vietnam over 1000 years, this project is being carried out by Center for Southeast Asian Studies at Kyoto University. Study about historical site is very importance because of history of Thang Long-Hanoi is associated with history of sites. In this paper including knowledge about historical sites and it's usable for project work. And from other side collection of historical sources which is given by historical materials from differences sources with the statistic, investigation and etc.. Beside the big help of Information technology, Remote Sensing and GIS enhancement, information from many sources researched under advance information as the creation of thematic maps, historical map, land use land cover map, topographic map etc... with the time dimension thematic maps will be build in 4D space for Thang Long- Hanoi.

In the first step of Project, we collected 150 historical sites in Hanoi, with the help of some historical descriptions issuing by office of 1000th Anniversary Celebration and from other sources. In our experience study very detail of every importance historical site which will have a big support for study about Thang Long-Hanoi. Historical site can support good location for geo-references, support information for changes of place-name, administrative land, etc... and cultural heritage was existed and continue displaying the spirit, a tradition which are part of Thang Long heritage.

2. APPLYING HISTORICAL SITES TO STUDY HISTORICAL MAP

2.1 Historical Map and Historical material

Most historical GIS would be impossible without historical maps, historical document which noted information about geographic location and spatial information record the geographic information that is fundamental to reconstructing past places, where pagodas, temple, villages, town, region, or nation. But some problems are there in old historical maps, historical documents.

Historical maps: - Almost historical map had draw with simple estimate and calculate by ancient geologist there are no good accuracy

- Lack of detail in historical map, most of old historical maps are not enough information compare with the present historical maps.

Historical Material:

- Written source of ancient scientist
- Extraction, collection, research and written by expert in historical field and geography.

From both of sources, although there are not given exactly location as longitude, latitude and boundaries between the village, district etc...but from depiction we can use to verify and arrange vaguely location of the village, and historical sites

2.2 Methodology of Creating Historical map

More importantly for the aims of historical research, information that was difficult to perceive for our own investigation. We can now measure elevation, distance, and area, and rotate the image to place ourselves at different viewpoints. Ordinarily, the first step in preparing a paper map for use in GIS is scanning it. This purpose, it is best to capture map images at a very high resolution. If one's main purpose is to study map as historical documents. Scanned maps can be easily incorporated into a GIS as graphic images. Connected by hot links to particular features in a GIS layer, historical maps can be opened to compare present and past configuration of given place or landscape. Integrating historical maps in GIS to analyze the spatial information they contain, or to layer then with other spatial data, requires that the maps be geo-referenced. That is, select *control points* on a scan of the original map must be aligned with their actual geographical location, either by assigning geographical coordinates to each point, or by linking each point to its equivalent on a model accurate digital map. Once the control points are in place, one applies mathematics algorithm to warp the original map image to fit the chosen map projection as nearly as possible. Further adjustment can be done manually to try to find the best fit for all parts of original map. Because it stretches and shrinks the map image like a thin sheet of rubber being pulled to fit a particular form

2.3 Application for Study area

Historical maps are precious material, which show various spatial distribution of land use, streets and so on of the historical importance at the time the maps were produced; they may be a dependable source of information regarding concepts of city planning of the past. In analysis of historical maps, the most practical method is to compare them with the present ones, for instance, by overlaying them. However, the low precision, in the geometrical sense, of the historical maps

makes the task of comparison very difficult. So far, overlay historical map on present map has been done basically by hand. Such method, however, has following drawbacks:

- (a) the work is not efficient
- (b) original information on historical maps is lacking
- (c) the method is not sometimes objective.

Study about historical site is very importance which can useful for discover distribution of the streets, villages, districts in ThangLong citadel because following estimate (Table 1): almost historical sites related with history of villages, country life, place for worship and so on.

Group of historical sites	Objects of the study about historical sites
Characteristics of times	Historical times, historical information
Places of worship of trade village	Times, identify relative sites locations, boundaries between trade villages in citadel
Sculpture Architecture	Time, historical information
Painting and casting arts	Time, historical information
French Architecture	Time, urban changes, urban developments
Historical was collapse	To protect, urban changes, comparing with previous times



Fig 1. Original writing colleted in historical sites, Right image is Confer a title on Hoa Than Pagoda by King, Left image is letters were sculptured surround bell.



Fig 2. Van Mieu, Hoan Kiem Lake, HaNoi flag tower, typical and importance sites showing almost map, including ancient map,Le Dynastys Map in 1490, map of Hanoi 1873, etc..

2.4 Identification Historical site

To locate the historical site in the Map or Satellite images, normally we should know the location of that point or identify the situation of that point from shape, texture, knowledge about that point, etc. in fact to combine two methods are better, because from GPS instrument we can identify location with the accuracies which can be given by different GPS instrument accuracy, weather condition, space around the location where we took the coordinate of the historical site. And from satellite image we can check it up and change the location so that is suitable with the fact.

The problem of data collection in Hanoi, almost of the historical sites is inner the main city, with the many houses and building obstruct GPS instrument receiving and transmitting the signals. But with the high resolution we can identify the historical site from the image ex. Quick Bird Image with the 0.6 m resolution. More than haft of 150 historical sites in Hanoi which we have visited and observed we could identify by human eyes based on high resolution image However other historical site had not really good landscape to identify exactly location, in that case combine coordinate taken from GPS instrument, Satellite images and human who know clearly about study area can be help to decide which point in the map is location Fig3.

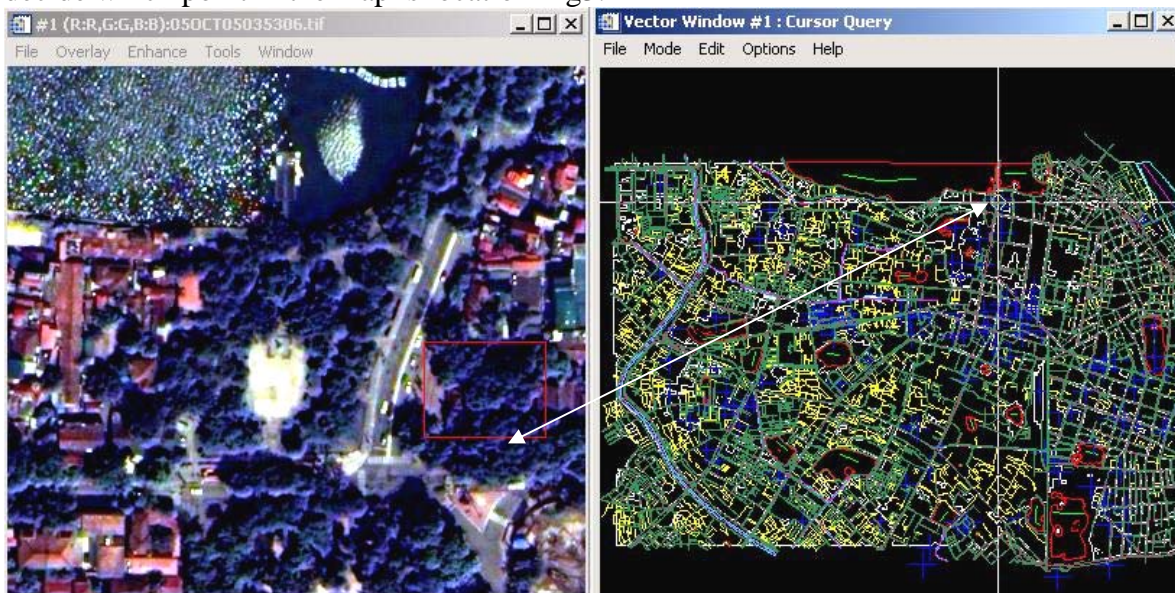


Fig 3: Left side is Quick Bird Image taken October, 2005, Right side vector data digitizing from left side image (Data taken from Prof. Shibayama and Prof. Venkatesh). Arrowhead in left and right are same point, inner the red triangle is historical site named Tran Quoc Pagoda, location given GPS in this case accurate's about 5 meters.

Input the GPS value which we have taken in the field had the location, some locations did not accurate with its real locations, Form Quick Bird data we can easily identify and correct almost. Some sites those have covered by houses and building, it is very difficult to recognize by Images, the combine of both methods are importance and useful

3 DATA MODEL FOR HISTORICAL MAP

3.1 Creation of records in the Database

Records in the relational database are also linked to geographic objects in GIS, in other words, for each record there are associated spatial objects in GIS layers which can be used to represent the historical places on digital map.

To accomplish this task, we had to clearly define what constitutes an historical administrative unit of the historical site and historical information description. According to the basic requirements for the study, there were three primary types of change to be recorded in the database:

- Change in name places
- Change in administrative type
- Change in location, area, or boundary.

In *our records* the three core elements for each historical place in the main table, to which a new row is added whenever one of the three core elements change. For our purposes each row is called an historical instance and is defined as a record with the period of time during which the place name, future type, and spatial object all remained unchanged, lasting from a specific begin date to specific end date. Should any of these three attributes change, a new record is added to the database. In the Table2 we show actual records from us database. Each of these records constitute a single *historical instance* and have their own unique ID number.

Name_roman	Chinese_transcribe Vietnamese	Type	Begin_yr	End_yr	Unique_id
Den Dong Huong	No data	Point	Le Dynasty	Nguyen Dynasty	100201
Den Dong Huong	No Data	Point	Nguyen Dynasty	1954	100202
Den Hai Ba Trung	No Data	Point	1142	1819	101301
Den Hai Ba Trung	No Data	Point	1819	1954	102102

Since the place name and future type are identical for all two instances of Dong Huong Temple, We need to provide some more information about what constituted changes. To do this the records in the main table include a year of changes.

Begin_yr	Begin change type	End_yr	End change type	Unique_id
Le Dynasty	Place name changed	Nguyen Dynasty	Administrative area change	100101
Nguyen Dynasty	Administrative area change	1954	End of database cover period	100102

From these columns we can now see that the first record for Dong Huong Temple appears in Le Dynasty, its name was changed in Nguyen Dynasty. In 1954 year the district where Hang Trong Temple was laid in was changed by administrative location's name.

3.2 Relation of the historical sites and boundaries

In most case, the geography of administrative units in our studies is defined in two ways: by the area over which they have jurisdiction, and situation of historical site changes. Using GIS technology it is possible to define both a polygon (to represent the area of jurisdiction) and a point (to represent historical site name) for single record. We found that boundary changes and changes of historical site situation some time occur at the same time and almost do not occur at the same time. In addition, these and other factors forced us to keep track of the area if

jurisdiction and the historical site situation for many particular historical place as separate objects in separate GIS layers.

Name_roman	Beg_yr	End_yr	Boundary_id	Point_id
Den Dong Huong	Le Dynasty	Nguyen Dynasty	100101	1001
Den Dong Huong	Nguyen Dynasty	1954	100102	1001

Some cases get the both of the changes: location changes and boundaries changes example Hai Ba Trung Temple was moved from Dong Nhan alluvial to Vo Mieu, Huong Vien, Tho Xuan district because of the flood making effect in 1819. In this case both location and boundary were changed.

Name_roman	Beg_yr	End_yr	Boundary_id	Point_id
Den Hai Ba	1142	1819	101301	1013
Den Hai Ba	1819	1954	102102	1021

4. POTENTIAL INFORMATION EXTRACTION FOR HISTORY IN THANG LONG - HANOI

Information Extraction (IE) is the name given to any process which selectively structures and combines data which is found, explicitly stated or implied, in one or more texts. The final output of the extraction process varies; in every case, however, it can be transformed so as to populate some type of database. Information analysts working long term on specific tasks already carry out information extraction manually with the express goal of database creation. One reason for interest in IE is its role in evaluating, and comparing, different Natural Language Processing technologies. Unlike other NLP technologies, MT for example, the evaluation process is concrete and can be performed *automatically*. This, plus the fact that a successful extraction system has immediate applications, has encouraged research funders to support both evaluations of and *research into IE*. It seems at the moment that this funding will continue and will bring about the existence of working systems. Applications of IE are still scarce. A few well known examples exist and other classified systems may also be in operation. It is certainly not

true that the level of the technology is such that it is easy to build systems for new tasks, or that the levels of performance are sufficiently high for use in fully automatic systems. System was prepared to provide a fully documented database of *historical administrative units in ThangLong* Records in the relation database are also linked to Geographic GIS. In other words, for each record there are associated spatial objects in GIS layers which can be used to represent the historical places on a digital map.

From many difference sources associating with advantage of rapidly develop information technology, creating the special system which support for historical study to extract requirement information form historical sources is probable.

5 CONCLUSION

This report has principally introduced the potential of the using historical sites in study Thang Long-Hanoi Project on preservation of Historical Heritage. Focus of this report is theory and some small application, but with the cooperation and support from Japan-Vietnam Geo-informatics Consortium, Center of Southeast Asian Studies, Kyoto

University, Japan etc... and all people who have worked with us, we hope that Vietnamese will have earliest the Thang Long-Hanoi with another views promoted the Thang-Long by area studies, informatics, to preservation Thang Long-Hanoi history and culture.

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