

Web-Based Spatial Data Infrastructure (SDI) System for Field of Archeology and Heritage Management

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Introduction

Information technology is improving rapidly in this decade as a technological innovation. Usage of Computers and other electronic devices are changing in a revolutionary manner as a result of the above innovation. Digital data tradition takes part of the socialization in e-village and the geographical distance is overcome by the technology in the e-village. Demand for the digital data, especially geo-spatial data, is a new trend in the world as a result of the development of geo-informatics and Geographical Information System (GIS) with GPS technology.

The use of the technology of the geographic information system (GIS) for digitally analyzing spatial problems has become pervasive and in the process, has created a demand for a vast amount of digital geospatial data. Increasingly complex analytical needs result in requirements for digital geospatial data. These data must be easily accessible and must have the ability to be integrated, generalized, and manipulated with known or predictable results. Fulfilling all of these requirements was not an easy task in the past decades but today it is not a huge task with new technological innovation. Spatial Data Infrastructure (SDI) is the key indicator to share and publish spatial data. The term spatial data infrastructure was coined in 1993 by the U.S. National Research Council to denote

a framework of technologies, policies, and institutional arrangements that together facilitate the creation, exchange, and use of geospatial data and related information resources across an information-sharing community. Such a framework can be implemented narrowly to enable the sharing of geospatial information within an organization or more broadly to be used at a national, regional, or global level (Esri, 2013).

Based on the pattern of usage, SDI can be divided in to two parts as NSDI and GSDI (Groot, R. and McLaughlin, J, 2003). National Spatial Data Infrastructure (NSDI) is the platform for publishing and sharing geo spatial data in local level and Global Spatial Data Infrastructure (GSDI) is the gold key to access the e-village overcoming the geographical boundary. "The NSDI provides a basis for spatial data discovery, evaluation, and application for users and providers within all levels of government, the commercial sector, the non-profit sector, and academia and by citizens in general." (The SDI Cookbook, 2013).

As an initial stage of sharing and publishing the spatial data the government of Sri Lanka has implemented the NSDI policy in November 2007 indicating the policy statement under the seven sub characteristics.

1. Data Standards

2. Copyright
3. Principle of Spatial Data
4. Security of Spatial data
5. Promotion of the use of the data in development planning
6. Promotion of the use of spatial data in the education
7. Data integration

This is a clear-cut evidence to indicate that Sri Lanka is ready to implement NSDI in order to publish and share the geo spatial data. The principle objective of this research is to create an NSDI web system for the archeology sector in Sri Lanka.

Research Question

Department of archeology and other authorized government institutes collect spatial data for their excavation and research purposes. In addition to that, researchers who are interested in the field of archeology collect spatial data using different technologies. Usually most of the institutions and researchers collect their spatial data in ad hoc manner only for their research purposes. It creates the problem of data redundancy. This is a common issue not only for the archaeological sector but also for the other sector which uses spatial data for their activities. So, it was necessary to introduce some mechanism in order to publish and share spatial data. The NSDI is the common mechanism to resolve such kind of issues which are incorporated with spatial data.

Methodology

Anuradhapura and Polonnaruwa districts were selected as a research area in order to comprise the ancient capitals of Anuradhapura and Polonnaruwa. Most popular pilgrimage and archeological places were selected as a sample for the research. Geo spatially located data was collected by using GPS and an image of each location was collected. Other necessary information of the places was collected using secondary data sources.

Data publication and creating NSDI system is based on two separated activities. First one is uploading geo rectified spatial data in to the Arc server using a free account. Arc GIS 10.1 is used as application software for preparation and refitting spatial data. Second one is integrating Arc server with web site. Web site was created using Joomla 2.5 Content Management System (CMS) and WAMP server is used as basic IIS of the NSDI web system. It is facilitated to visualize each archeological place on Google map and relevant attributes display as popup menu of the system. It is a great opportunity to visualize point, line and polygon data in this system and any registered user able to download digital data with privileges of the administrator of the system.

Conclusion

SDI will inevitably impact on the field of archeology to conduct consequential research at global level sharing geo spatial data. The proposed SDI system will be facilitated to share geo spatial digital data and information with the entire community. In addition to that, the problem of data redundancy will be resolved at some level and this SDI system will be a platform to all the researchers and organizations who are interested in the field of archeology to share their experience and data.

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