Chapter 40

TCloud:
Cloud SDI Model for Tourism Information Infrastructure Management

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ABSTRACT

This chapter proposes and develops a cloud-computing-based SDI model named as TCloud for sharing, analysis, and processing of spatial data particularly in the Temple City of India, Bhubaneswar. The main purpose of TCloud is to integrate all the spatial information such as tourism sites which include various temples, mosques, churches, monuments, lakes, mountains, rivers, forests, etc. TCloud can help the decision maker or planner or common users to get enough information for their further research and studies. It has used open source GIS quantum GIS for the development of spatial database whereas QGIS plugin has been linked with quantum GIS for invoking cloud computing environment. It has also discussed the various spatial overlay analysis in TCloud environment.

INTRODUCTION

Spatial Data Infrastructure (SDI) has facilitated the sharing and exchanging of spatial data holding by different stakeholders. It has initiated to create an environment that enable a wide diversity of common users to access, retrieve and disseminate spatial as well as non-spatial data in secure way (Georis-Creuseveau et al., 2016; Smith et al., 2004). The technological growing need to organise the data across various disciplines and organisations and also the need to create multi-participant and decision-supported

environments that have resulted in the concept of SDI. It enable users to save resources, time and effort when trying to acquire new datasets by avoiding duplication of expenses associated with generation and maintenance of spatial data (Mansourian et al., 2005; Giuliani et al., 2016; Coleman et al., 2016).

SDI can be used for decision making, storage of various kinds of spatial data, bringing data and maps to a common scale as per the user needs. It has the ability to superimposing, querying, analyzing, designing and presenting final maps/ reports to the administrators and planners (Yue et al., 2016; Senaratne et al., 2017; Koswatte et al., 2015). The utility of SDI has become widely popular and are being used for a wide range of applications (Pun-Cheng et al., 2016; Mwange et al., 2016). There are five important components of SDI which has been encapsulated. The component of SDI has shown in Figure 1. In the dynamic nature of SDI, technologies, polices and accessing network are the core dynamic components where people and data are the static components (Georis-Creuseveau et al., 2016).

SDI can play a vital role in various applications such as environmental monitoring, natural resource management, healthcare, land use planning and urban planning. SDI integrates common database operations such as query formation, statistical computations and overlay analysis with unique visualization and geographical functionalities. These characteristics are distinguish SDI from other information systems and make it valuable to a wide range of public and private enterprises for explaining events, predicting outcomes and designing strategies (Barik and Samaddar, 2014(a); Barik and Samaddar, 2014(b)).

SDI with specific model i.e. SDI Model has also played an important role in mineral resources, water resources and coastal management in which it has potential to share and analysis all the hydrologiacal data, coastal data and mineral data related spatial data in a common platform. SDI Model has the possiblity to improve the spatial dimension of coastal zone aswell as water resources management. It can allow to access interoperability of data from river, coastal, marine and terrestrial environments (Strain et al., 2004; Hamylton and Prosper, 2012; Idrees, 2015). For seamless development of SDI Model, it has integrated with cloud computing. SDI Model has merged with cloud computing to perform a value added services that give rise to spatial cloud computing. The spatial data have rich information about temporal as well as spatial distributions. In traditional setup, we send the data to the cloud where these are going for further processing and analysis (Yang et al., 2017;Yang et al., 2011).

For the development and implementation of SDI Model, there are many open source software available as compete with the proprietary software (Raghunathan et al., 2005; Barik et al., 2009). Developers have created many Open Source Libraries and Plugin to handle huge spatial data. Open Geospatial Consortium (OGC) aims to strengthen utility of development of community-led projects and Open Source

Figure 1. Five important components of SDI (Georis-Creuseveau et al., 2016; Laura et al., 2017)
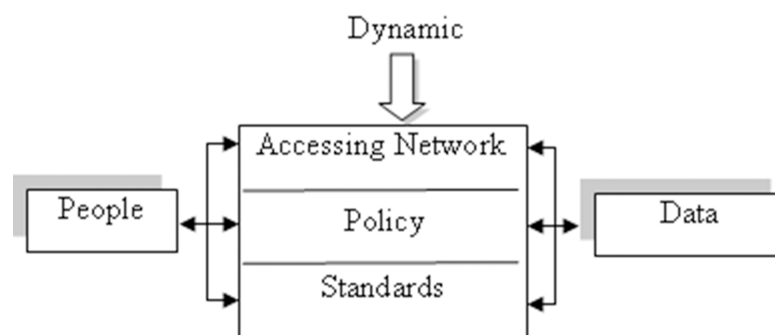
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