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Spatio-Temporal Object Relational for Biodiversity System (STORe-Biodi)

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ummary

Spatio-temporal data model for biodiversity is owing importance to the biodiversity data anagement, forest and environment control. patio-temporal data models have received much tention in the database research community ecause of their practical importance and teresting challenges they pose. This paper is scussed upon the research activities of lecting, designing, implementing the data odel. The paper can be divided by two major rts, first: discuss about biodiversity data model nd secondly: spatio-temporal conceptual amework design of biodiversity data model for ng terms stewardship of biodiversity formation. In this paper our main objective to inimize the extension required in SQL nguage. This paper also focuses on the unified odels of space and time using object-relation proach. In particular, we propose a conceptual ject-relational spatial temporal data model ased on Donna J. Peuquet's pyramid framework. tandard and user management queries are plied to test the model. After extensive testing, e data model performed admirably in anaging biodiversity data.

eywords: Spatio-temporal, Data model, iodiversity data, Object-relational, SQL.

Introduction

fter two decades of research, representation of pace and time in databases and functional plications are still problematic [1]. This paper presents a universal object-relational framework for spatial temporal data modeling. Spatial temporal data modeling aims to extend the existing data models to include space and time in order to better describe our dynamic real world.

Problem with previous data models is that spatial and temporal aspects of databases are modeled separately [2], [3]. Spatial database focuses on supporting geometries [4], while temporal databases focus on the past state [5]. But in many circumstances, such as environmental monitoring, resource management, transportation scheduling, etc, spatial and temporal attributes should be connected together. Many current systems can handle only one aspect of space and time. Spatial systems always fail to cater for many temporal aspects in a dynamic environment [6]. Though many researchers have found the necessity of integration of space and time in one environment, by far, little such work has been done.

Another problem is representation of data should be natural to human. The structures of space and time are identified as essential for the realization of cognitive systems [10]. According to Donna J. Peuquet and her group [11], models of spatial temporal data in geographical database representations must incorporate human cognitive principles. Human knowledge of the dynamic geographical world comprises of three different (and interrelated) subsystems that handle *what*, *where* and *when* aspects of object properties [8]. Object relational approach with its characteristic of inheritance and aggregation is