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REVIEW ARTICLE

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PARAMOUNTCY OF SPATIAL METADATA

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ABSTRACT
There are various metadata standards and guidelines to describe a product .The present metadata standard (example ISO Standards) gives complete, apparent definition for the data quality elements, sub elements. Inspire of all these standards ,metadata is still not capable of providing actual meaning of the metadata information to users ,data quality information contains industry specific term in textual form and does not help users to decide if a dataset should be acquired or used . The perspective in which geospatial data is used has changed significantly during the past decade but parameters list for describing geographic data has not changed in the past 15 years. Now Consumers can easily access spatial data through the internet. To provide users information about spatial data quality in a simple format, we need to define database structures that may store this information. So In this paper we are proposing a method to process and communicate the quality of dataset effectively in visual form to end users for better understanding of the quality information of spatial metadata.

Key words: Data quality, metadata, ISO standards, databases.

1. INTRODUCTION

Today's advancement in technology like cloud computing, sensors, data wireless networks, growth of internet and societal transformation results in exponential growth of data generation as compare to past years as everything on internet is recorded[3]. Each and every activity of user on internet is generating data. With this development of technology, spatial data have become progressively more important. This large Quantity of data is consistently growing, providing Consumers an ever growing choice of spatial datasets[1] .Spatial Data are extensively used by the public sector, private companies and the public attempt for the decision making, Strategic planning, risk analysis, site selection, and route finding[5]. The capture and storage of spatial data are time consuming and costly. The creation of spatial data from spatial raw data requires professionals, experts and advanced skills[6].The process of searching new and valuable patterns from vast spatial dataset is called as spatial data mining. Traditional database cannot handle the spatial data, so notion of spatial database and spatial data warehouse came into existence. SOLAP tools support high level of data interaction to users in order to provide data quality information to users, Metadata is necessary information used to describe the data in order to make meaningful interpretation of sensor data, instrument status, or observatory function [2]. Spatial data quality information can be managed in multi-dimensional database to present information

at different dimensions and levels so that the results can be visualised in the form of maps, tables and charts. Spatial data is widely produced from different sources [7].Metadata is used to provide information about spatial dataset .Metadata system allow consumers to find the information used for describing datasets located on network. Metadata is used as an important tool for recording data assets and in the spatial information industry it is also used to describe the quality of data to consumers[8]. ISO/TC 211 specify standardizing in the area of digital geographic earth .These standards specify reference model ,spatial and temporal schema ,metadata location based services, presenting and transferring such data in digital / electronic form between various users, consumers ,systems ,places[9].

1.2 Geo-Spatial Data

Digital information has a growing importance in business, industries, healthcare, agriculture, finance, weather forecasting, scientific research, astronomy, transportation and even for society development [11]. Geospatial location is valuable in organizing the architecting and constructing enterprise data stores[10]. Vast investments are made in collecting administrating and disseminating information of all types , greater part of which includes spatial component[12].Geographic data is used for the digital representation of spatial component. In GIS, there are two basic spatial data types representing the real world raster and vector dataset. In the raster data model, land cover is represented as single square cells. Each cell will have a value corresponding to its land cover type. In the vector data model, features on the earth are represented as points, lines ,polygons ,TINs (triangulated irregular networks).

1.3Geo-Spatial Metadata

Geospatial Metadata describes the features of geographic data that are useful in attaching value to geographic dataset. Metadata are set of data that gives information about other data.It is related to objects that have an explicit or implicit geographic extent .Geospatial metadata is the data that is linked with some position on the surface of the globe[14].Geospatial metadata is generally used to record geospatial data sets but can also be used to record geospatial resources including mapping applications, data models, and web based services[15]. Metadata documents consist of the main library catalog elements such as title ,abstract and publication date; geographic elements such as extents and projection; and database elements such as attribute label definitions and attribute domain values[16]. Metadata enables consumers of geospatial data to get the information and data they require and to conclude how best to use it. Metadata is used in data management , preservation of data history so the data can be maintained, updated ,deleted and reused[17].

2.Related work

Lukasz Grus focused on the theoretical bases to assess the Spatial Data Infrastructure (SDI) and presented a Multi-view SDI assessment framework [18].Nichol G. E et al describes a work in progress: a review of social, economic, and environmental models applicable to landscape analysis, and the 'mapping' of these models to two chosen landscape analysis frameworks [19].Ternier, S. et al presented and analyzed the standards-based Ariadne infrastructure for managing learning objects in an open and scalable architecture. The architecture supports the integration of learning objects in multiple, distributed repository networks[20]. Sheng Gao et al proposed to evaluate Geospatial Web Service quality from Geospatial Web Service activities and Geospatial Service usage. The Geospatial Web Service activities contain four layers: Geospatial Web Service commitment, Geospatial Web Service description, Geospatial Web Service process, and Geospatial Web Service outcome layers[21].Olfat H.et al presented the results of the assessment process and explores the key areas of spatial metadata automation research in Australia also discussed discussed the structure of the questionnaire and the results of the responses analysis[22].Mullinix, C. discussed examples of water quality data analysis based on nutrient type, source, yield, and area of interest using the NYM tool for the Chesapeake Bay watershed also described examples of map-based

techniques for identifying high and low nutrient yield areas; web map engines; and data visualization and data management techniques[23].Scholten Henk J. has proposed the 'European Spatial Metadata Infrastructure' (ESMI) project with the objective to link existing and future metadata systems using Internet, to improve communication between data sources, data processing and the use of relevant spatial data in GISs[24].

3. Problem Definition

Spatial data is widely used for various applications by various experts and non expert users. The vast increase of spatial data has raised many serious issues of which giving meaningful data quality information has become a predominant factor [101].Consumers need a easy and fast way of communication rather than textual metadata[102]. Research has to be done on better quality evaluation and visualisation using latest technologies[103].

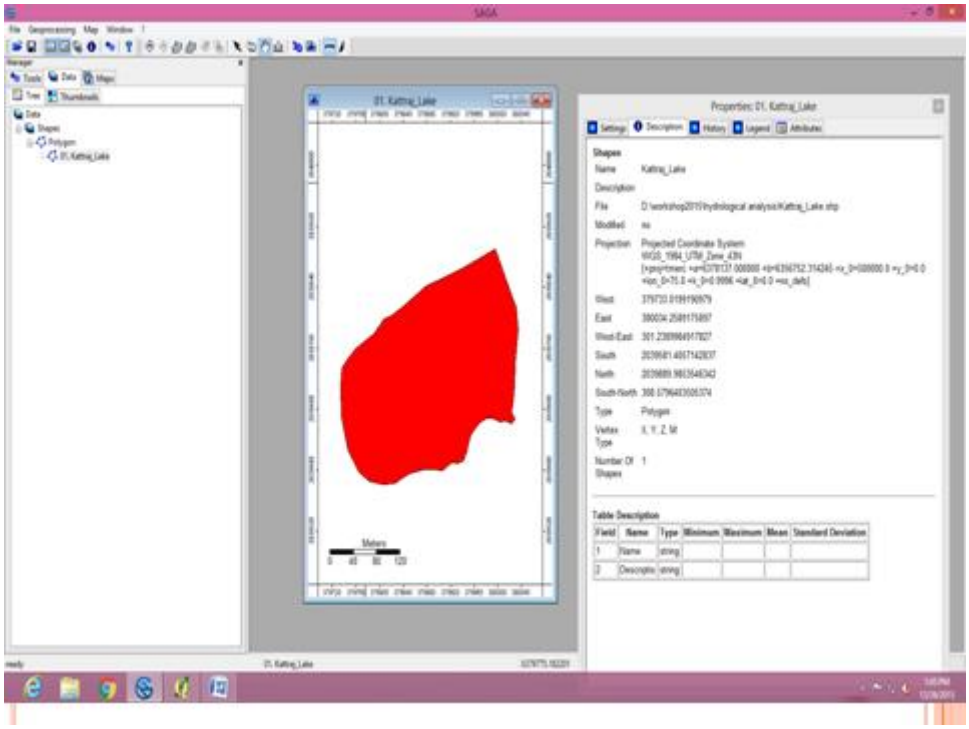

Figure: Viewing Spatial Metadata in SAGA GIS Tool

4. Proposed Work

A method and model is needed to process and communicate the quality of dataset effectively ,stored in spatial database .The Spatial information should be communicated to end user via maps, tables ,dashboards for visualising the quality of a dataset ,to get the actual understanding of spatial metadata. This can be achieved by preparing a data quality model that can quantify and communicate the quality of the dataset in visual form at different levels of data granularities.

5.Conclusion and Future Work

Geospatial data is widely used by different type of users but all are not skilled in understanding the metadata information provided to describe the dataset. So there is risk of misuse of dataset[99]. Proper Organization and communication of the quality information will enable the Users in assessing the data quality information[100]. This can be done by representing metadata in visual form rather than textual form.

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