Metadata Visualization: An Insight Based On Experience

2013

M.Sc , M.tech (ALCCS) SAMIT KUMAR , SATCOM DIVISION
NATIONAL INFORMATICS CENTER, Mo Comm. & IT, INDIA

SUMMARY

Metadata represented in hierarchical structure as geographic cluster using "National Optical Fiber Network ", can be used to visualize the impact of temporal geospatial local demographic data in resolving policy issues at various level from local Gram-Panchayats to National level.

INTRODUCTION

To reach to a conclusion in cases that are mutually exclusive yet dependents on each other, its human tendency is to assume certain basic parameters so that the matter can be resolved in the stipulated time. Such assumptions may lead to situations that may not the precise solution of the problem. For example if we consider the population benefitted by the deployment of Optical fiber network the varied results may arise due to the various algorithms adapted to assess the population in pilot grampanchayats of 62 villages in 3 geographically dispersed blocks in India. One basic assumption would be that if a village has approximate population of around 3000 people then 62 villages would have 62 times 3000 population. It's obvious to decide that how much reliable "figure" does such algorithm would provide!

"Metadata visualization" provides precise information about the characteristics of any data or other metadata linked to Metadata in subject. It can be considered that Metadata information processing is a Top-down approach of analysis which is developed due to bottom-up approach of data collection where the data has its own temporal and spatial meaning at each level of visualization. Thus metadata visualization can be used to develop semantic web applications

VISUALISING METADATA

Metadata representation should be such that the goal can be identified by simple inspection of the metadata hence an accurate analysis of metadata is essential. Such analysis can only be reached after the specifications of elements of metadata are defined. Local definition of elemental data then becomes the Metadata for the next level of the geographical hierarchy which in turn can be used as elemental data for the next higher level. It is also important to note that such data has temporal and spatial meaning. Thus a constant feedback mechanism is essential for metadata processing.

In addition it's important to state the dimensional characteristics of metadata which can be found in various formats as listed below

- Numerical : Such as any number format
- Nominal : As a token
- Ordinal : As a count or Order (Not for any measures)
- Spatial : Geo-coded info with location reference and applicability
- Temporal : time coded info with time reference and applicability
- Free text : Any Alphanumeric text

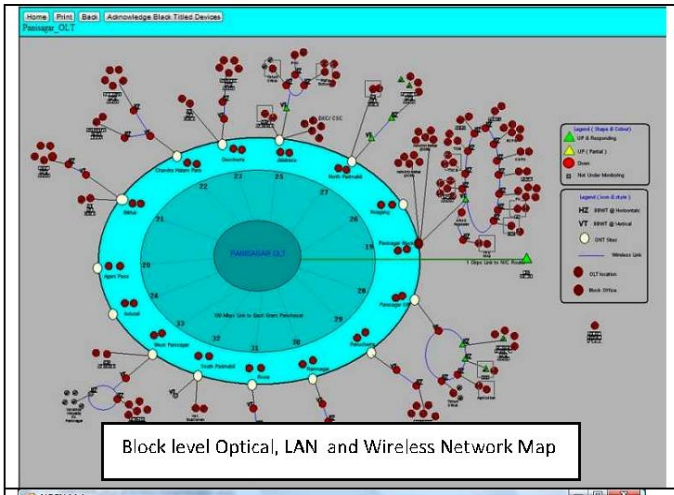
M.Sc , M.tech (ALCCS) SAMIT KUMAR , SATCOM DIVISION
NATIONAL INFORMATICS CENTER, Mo Comm. & IT, INDIA

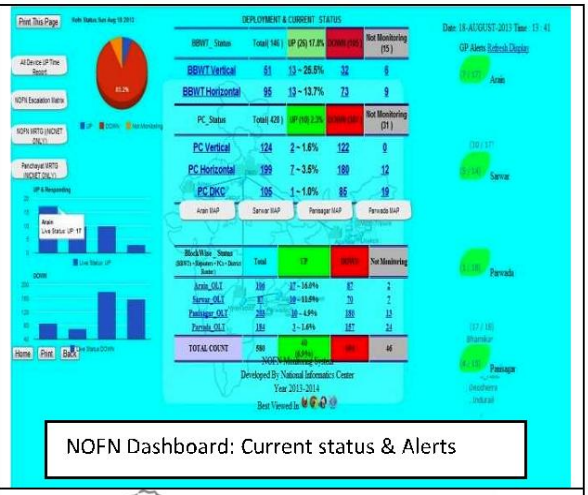
- Color codes : Any color scheme such as RED, GREEN, YELLOW, and CYAN etc.

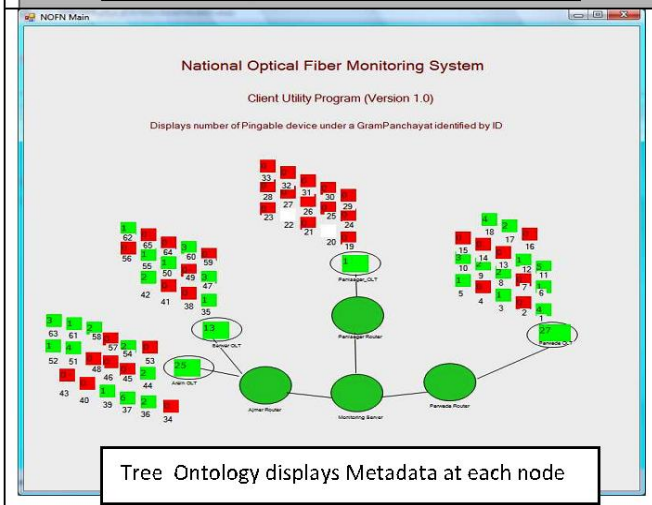
NOFN EXAMPLE

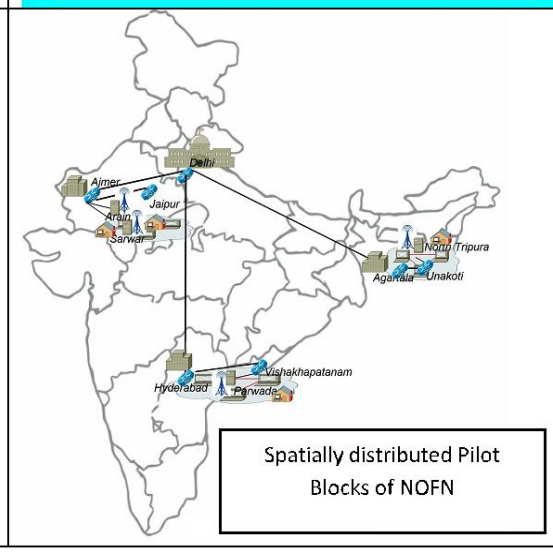
National Optical Fiber Network (NOFN) is a pilot project to provide high speed data (~100Mbps) at govt. run institutes located in the remotest areas in the 62 villages in India. This network utilizes Fiber Optics Network, Local LANs and Wireless Connectivity using Broad Band Wireless terminals. Institutes covered ranges from Educational, Health, Agriculture, Women Empowerment, Police stations, District and Block offices in these villages as "Horizontals Institutes " and the Grampanchayats as "Verticals" .

Each Horizontal has 100 mbps connectivity to the respective vertical and each vertical is connected to a Fiber Line terminal at Block Head Quarter. Every Block Head Quarter is connected to district headquarters using 1Gbps Fiber Link. At district router the Network is routed in the National Network NICNET.









M.Sc , M.tech (ALCCS) SAMIT KUMAR , SATCOM DIVISION
NATIONAL INFORMATICS CENTER, Mo Comm. & IT, INDIA

Verticals are the locations connected to the Optical Line terminals using optical fiber network and Horizontals are the location connected to verticals using wireless network. Dashboard as Intranet web application displays current connectivity status and generates alerts if any important node gets unconnected. Tree ontology is a representation of connectivity monitoring in which the root node is the monitoring server which is connected to the next level of nodes representing the district routers displaying total number and currently responding devices along with the color code to display the connectivity status at the node. The next level is the Optical line terminal at each of the Pilot Blocks displaying devices that are connected. These nodes are in turn connected to the last mile of the Optical network termed as Optical network terminal. Similar way of representation was followed to display further wireless connectivity to the horizontal sites.

SCOPE of METHODOLOGY

Apart from providing services ranging from Health , education , Land records , Govt. License , Vehicle registration, Postal & distribution system , socials security , policing etc . A Countrywide WAN such as NOFN can be used to collect real time data at various levels. The "metadata" defined at the various levels of the "Tree Ontology" can represent somewhat precise picture on the real time basis. Metadata defined in such "temporal" and "spatial" manner displays real picture of the problems of under and over nourished areas and therefore an optimal flow can be maintained the overall health of the Nation.

CONCLSUIONS

Representation of Metadata on a spatially distributed map & Ontological tree can represent high level of information in the form which can be easily identified by simple inspection just by analyzing Metadata represented in maps and ontological Tree. It's important to quote that the Metadata depends on its Elements and hence temporal and spatial relevance of Metadata and its Elements is also essential.

BIBLIOGRAPHY

- A Visualisation of a Hierarchical Structure in Geographical Metadata : Urška Demšar
- Metadata Visualization with VisMeB : Peter Klein, Frank Müller, Harald Reiterer, Tobias Limbach
- Topic Models and Metadata for Visualizing Text Corpora : Justin Snyder, Rebecca Knowles, Mark Dredze, Matthew R. Gormley, Travis Wolfe
- Metadata Visualization for Digital Libraries: Interactive Timeline.Editing and Review : Vijay Kumar, Richard Furuta
- Visualization of Semantic Metadata and Ontologies : Paul Mutton1 and Jennifer Golbeck2
- Visualizing Mapping of Metadata Properties : Martin Hoernig, Wolfgang Weiss, Werner Bailer

M.Sc , M.tech (ALCCS) SAMIT KUMAR , SATCOM DIVISION
NATIONAL INFORMATICS CENTER, Mo Comm. & IT, INDIA