An Open Source Web GIS based Infrastructure and Environmental Planning for Universities

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Abstract

GIS and remote sensing is an eminent technology for representing geographical properties and used to store, retrieve, and visualizing geographical data in a useful manner. This paper implements a GIS and web based Navigation system to represent geospatial information linked to environmental and infrastructure resources of the University. The proposed system is framed for the University of Calicut, Kerala, so as to support the University administration for the planning and development processes. This system uses two different types of layers: base layers and overlay layers. Base layers such as Google satellite, Google hybrid, and Google street maps are used for mapping and Overlays are used for representing infrastructure facilities including University buildings, roads inside the campus, water pipelines, OFC Cables, locations of the biometric punching machines and the environmental resources such as water bodies, vegetation, soil and rock. The open source GIS tools are used for the implementation of this work. It also discusses the potential of the open source and how it is used in web GIS application development. The proposed system also capable to display different geographical object parameters such as name, area, content, longitude and latitude values of the special and non-special resources within the University campus. As this web GIS application is built on a generic frame work, it could systematically support and solve many geospatial related decision making issues currently faced by many of the Indian Universities.
Why maps?

- **Efficient** and **effective** way to look at geographic data
- Provide quick overview of spatial **patterns**, **relationships**, **trends**...leads to Discovery!, **Explanation**.
- Aid to **Decision Making**
University's face some geographical problems

- currently the University has no such geographical information system based applications
- Therefore a printed map is followed for solving various issues associated to geospatial information
- The main problem with the manual map is that it has no accurate information and the map is not geo-referenced.
- The other problem with the manual mapping system is that spatial information of the University cannot be accessed through internet by the users or the planners
- We identified many difficulties faced by the technical staff in the University related to the construction and maintenance of the buildings, optical fiber cables, water pipe lines, biometric punching systems etc.
- The administration also finds difficulties in decision making and planning due to the lack of systematic geospatial related information in infrastructure and environmental related resources
We have....
GIS and remote sensing
Gis service

- Urban and regional planning application
- Soil mapping
- Agricultural mapping
- Forestry application
- Water resource application
- Wildlife ecology
- Archaeological application
- Environmental assessment
- Natural disaster assessment
Cont...

- Modern education system
- Housing quality studies
- Vegetation condition
- Transportation route location
- Commercial site location
- Population estimate
- Traffic and parking
- Real estate
- 3 d mapping
Tools and Frame work
Data collection tools.
Qgis perform vector and raster analysis
Data analysis tools

- OpenGeo
- GeoServer
- PostGIS
- PostgreSQL
- Sencha
Working of a GeoServer
Google physical view with boundary information
Google street view and overlays layer is boundary of Calicut University
Google satellite view with boundary information
Map view of University buildings with details
Map view of water pipelines with details
Working gis app.
Feature development

The next stage of this project would be focusing to develop a complete web based open GIS solution by incorporating different geographical layers to extract soil information, to find variation of vegetation and climate variation etc. with a mobile version of it. The feasibility of developing a decision support module for the web GIS that helps in infrastructure and environmental planning will also be studied.
REFERENCES

Cont..


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Thank You!