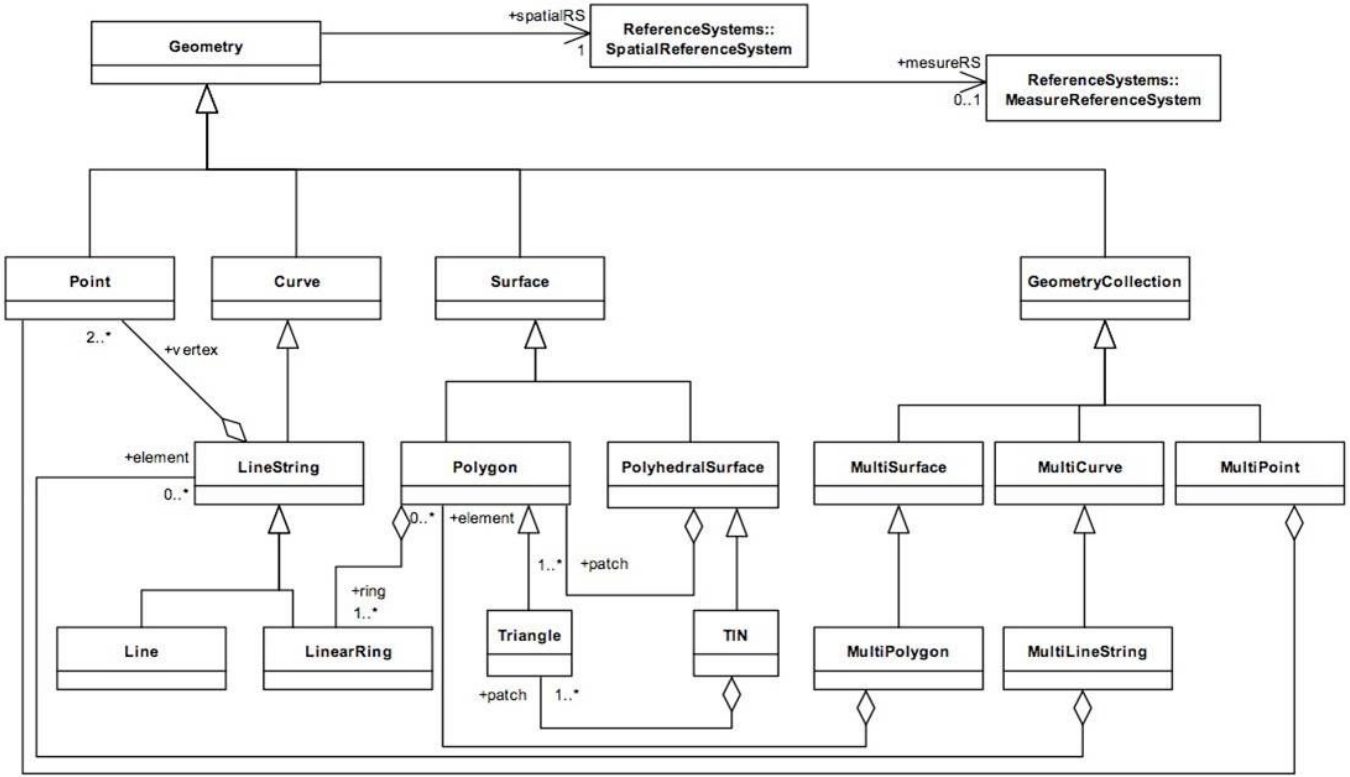
OGC Standards - some case studies

by

Simple Feature Specification intro



Simple Feature Specification - geometry methods

Dimension ( ):Integer—The inherent dimension of this Geometry object, which must be less than or equal to the coordinate dimension. This specification is restricted to geometries in two-dimensional coordinate space.

GeometryType ( ):String —Returns the name of the instantiable subtype of Geometry of which this Geometry instance is a member. The name of the instantiable subtype of Geometry is returned as a string.

SRID ( ):Integer—Returns the Spatial Reference System ID for this Geometry.

Envelope( ):Geometry—The minimum bounding box for this Geometry, returned as a Geometry. The polygon is defined by the corner points of the bounding box ((MINX, MINY), (MAXX, MINY), (MAXX,MAXY), (MINX, MAXY), (MINX, MINY)).

AsText( ):String —Exports this Geometry to a specific well-known text representation of Geometry.

AsBinary( ):Binary—Exports this Geometry to a specific well-known binary representation of Geometry.

IsEmpty( ):Integer —Returns 1 (TRUE) if this Geometry is the empty geometry . If true, then this Geometry represents the empty point set, ∅, for the coordinate space.

IsSimple( ):Integer —Returns 1 (TRUE) if this Geometry has no anomalous geometric points, such as self intersection or self tangency. The description of each instantiable geometric class will include the specific conditions that cause an instance of that class to be classified as not simple.

Simple Feature Specification - spatial analysis

Distance(anotherGeometry:Geometry):Double—Returns the shortest distance between any two points in the two geometries as calculated in the spatial reference system of this Geometry.

Buffer(distance:Double):Geometry—Returns a geometry that represents all points whose distance from this Geometry is less than or equal to distance. Calculations are in the Spatial Reference System of this Geometry.

ConvexHull( ):Geometry—Returns a geometry that represents the convex hull of this Geometry.

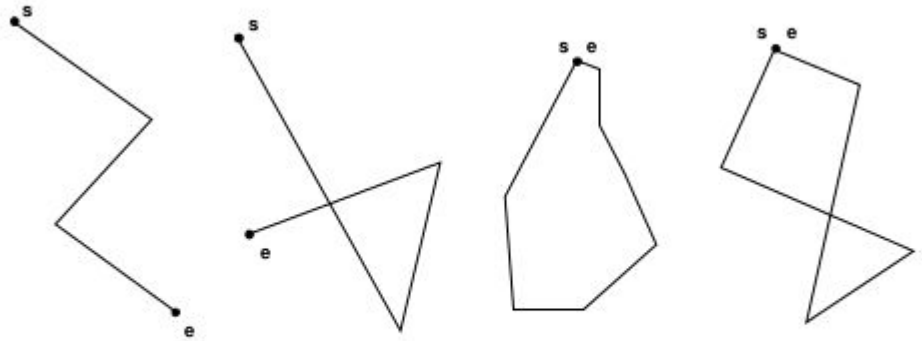
Intersection(anotherGeometry:Geometry):Geometry—Returns a geometry that represents the point set intersection of this Geometry with anotherGeometry.

Union(anotherGeometry:Geometry):Geometry—Returns a geometry that represents the point set union of this Geometry with anotherGeometry.

Difference(anotherGeometry:Geometry):Geometry—Returns a geometry that represents the point set difference of this Geometry with anotherGeometry.

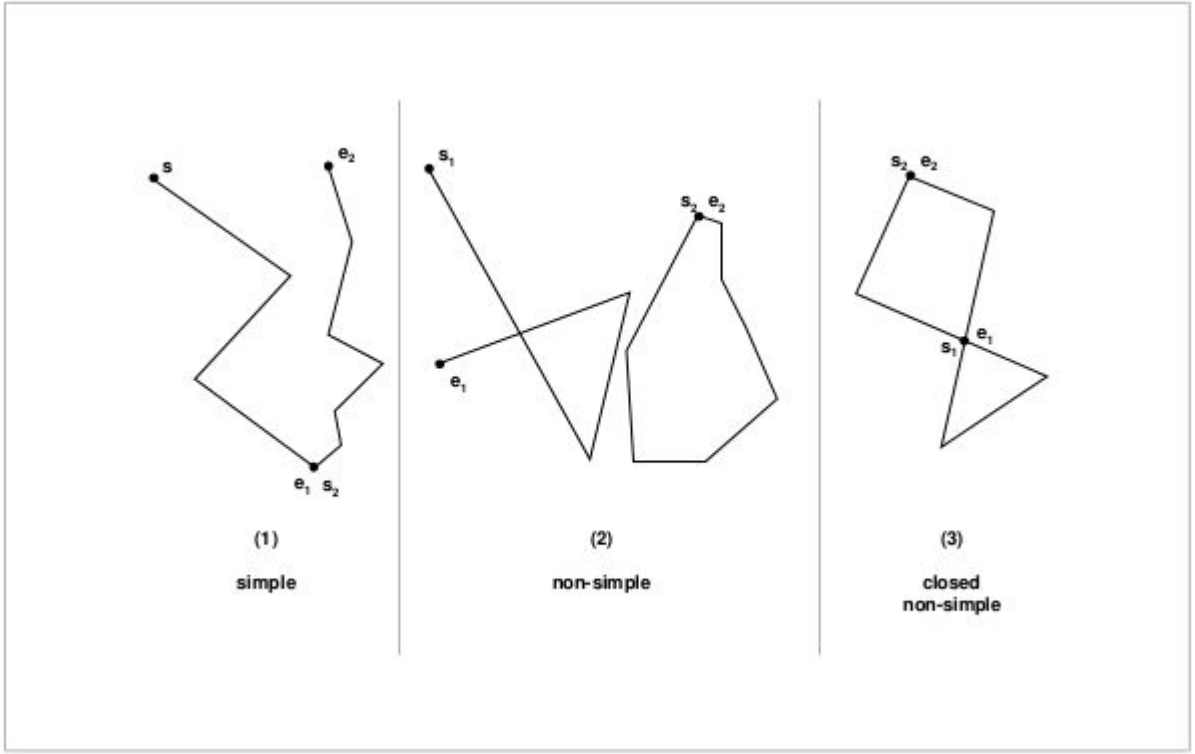
SymDifference(anotherGeometry:Geometry):Geometry—Returns a geometry that represents the point set symmetric difference of this Geometry with anotherGeometry

Geometries - linestring

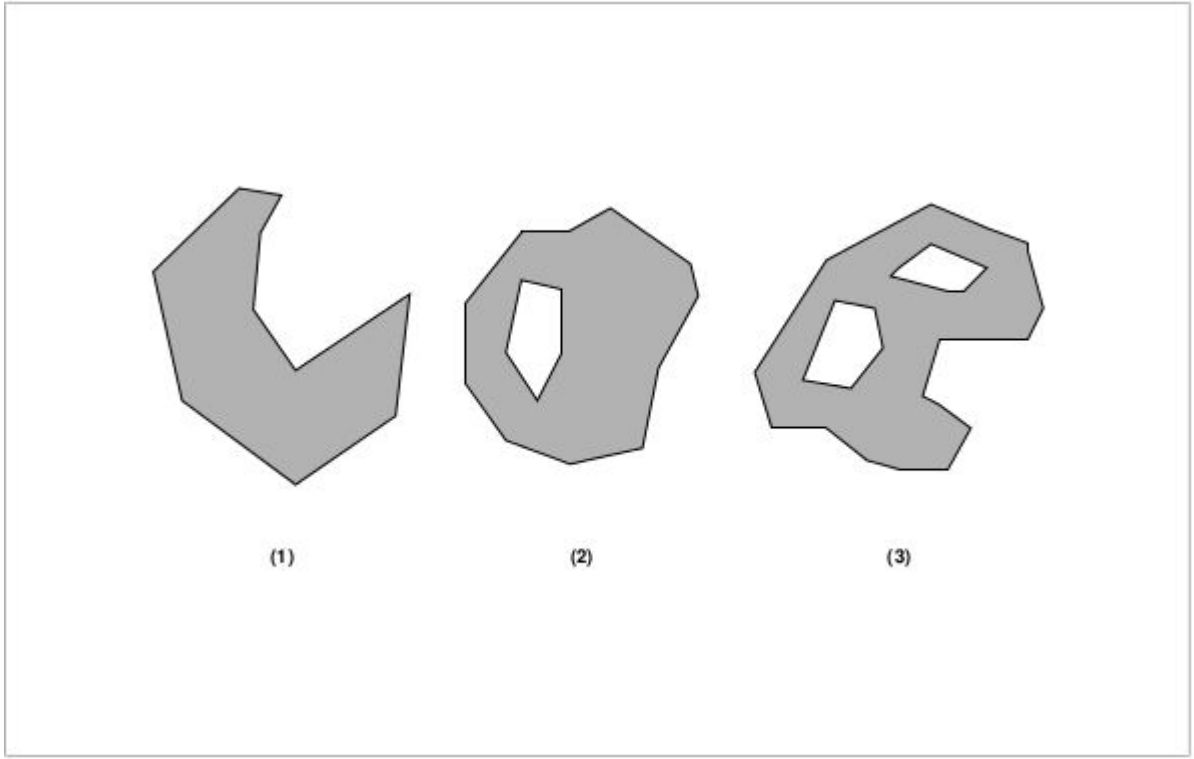


Geometries - multilinestring

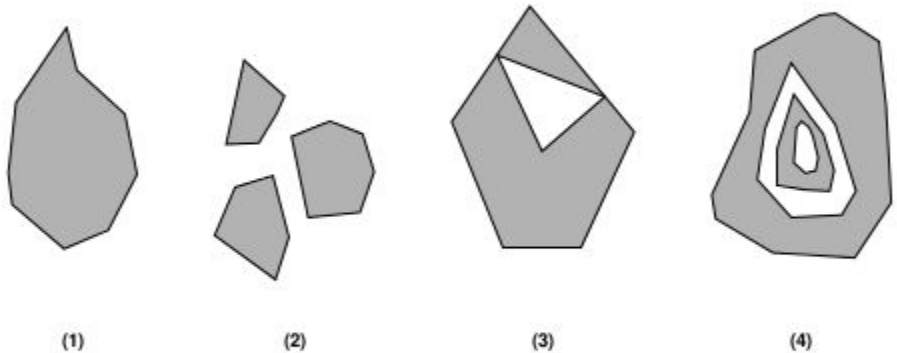
A MultiLineString is a MultiCurve whose elements are LineStrings.



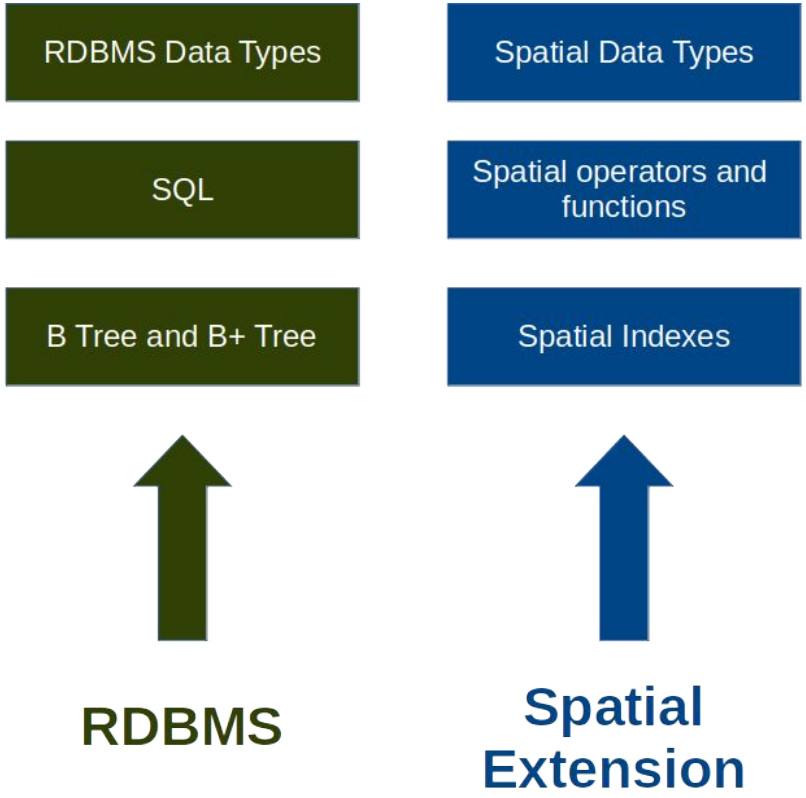
Geometries - polygon



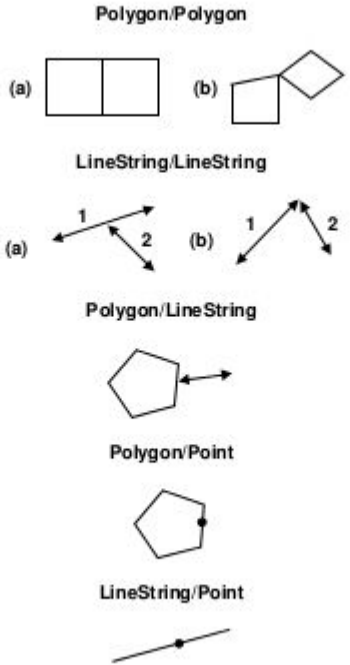
Geometries - multi polygon



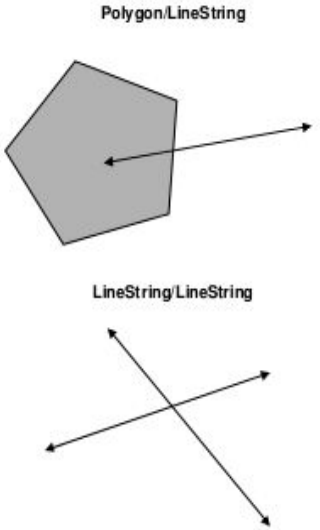
Spatial databases



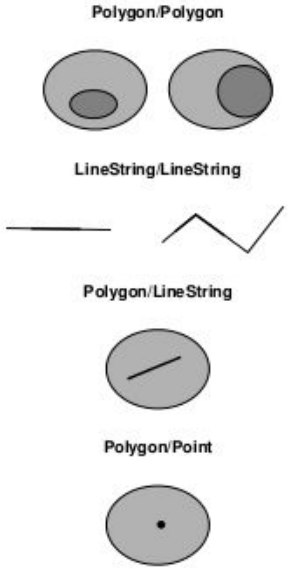
Spatial databases - spatial relationships



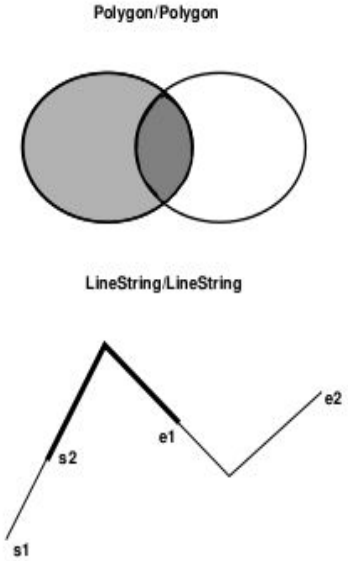
Touches



Crosses



Within



Overlap

Creation of geometry

Geometry Type	SQL Text Literal Representation	Comment
Point	`'POINT (10 10)'`	a `Point`
LineString	`'LINESTRING ( 10 10, 20 20, 30 40)'`	a `LineString` with 3 points
Polygon	`'POLYGON ((10 10, 10 20, 20 20, 20 15, 10 10))'`	a `Polygon` with 1 exterior ring and 0 interior rings
Multipoint	`'MULTIPOINT (10 10, 20 20)'`	a `MultiPoint` with 2 point
MultiLineString	`'MULTILINESTRING ((10 10, 20 20), (15 15, 30 15))'`	a `MultiLineString` with 2 linestrings
MultiPolygon	`'MULTIPOLYGON ( ((10 10, 10 20, 20 20, 20 15, 10 10)), ((60 60, 70 70, 80 60, 60 60 ) ))'`	a `MultiPolygon` with 2 polygons
GeomCollection	`'GEOMETRYCOLLECTION (POINT (10 10), POINT (30 30), LINESTRING (15 15, 20 20))'`	a `GeometryCollection` consisting of 2 `Point` values and a `LineString` value

Create geometry from WKT

`PointFromText ( pointTaggedText String, SRID Integer): Point`	Construct a `Point`
`LineFromText( lineStringTaggedText String, SRID Integer) : LineString`	Construct a `LineString`
`PolyFromText( polygonTaggedText String, SRID Integer): Polygon`	Construct a `Polygon`
`MPointFromText (multiPointTaggedText String, SRID Integer): MultiPoint`	Construct a `MultiPoint`
`MLineFromText ( multiLineStringTaggedText String, SRID Integer): MultiLineString`	Construct a `MultiLineString`
`MPolyFromText( multiPolygonTaggedText String, SRID Integer): MultiPolygon`	Construct a `MultiPolygon`
`GeomCollFromTxt( geometryCollectionTaggedText String, SRID Integer): GeomCollection`	Construct a `GeometryCollection`

References

References

OGC Refernce Model - http://www.opengeospatial.org/standards/orm

Open GIS Simple Feature Specification

kaiinos

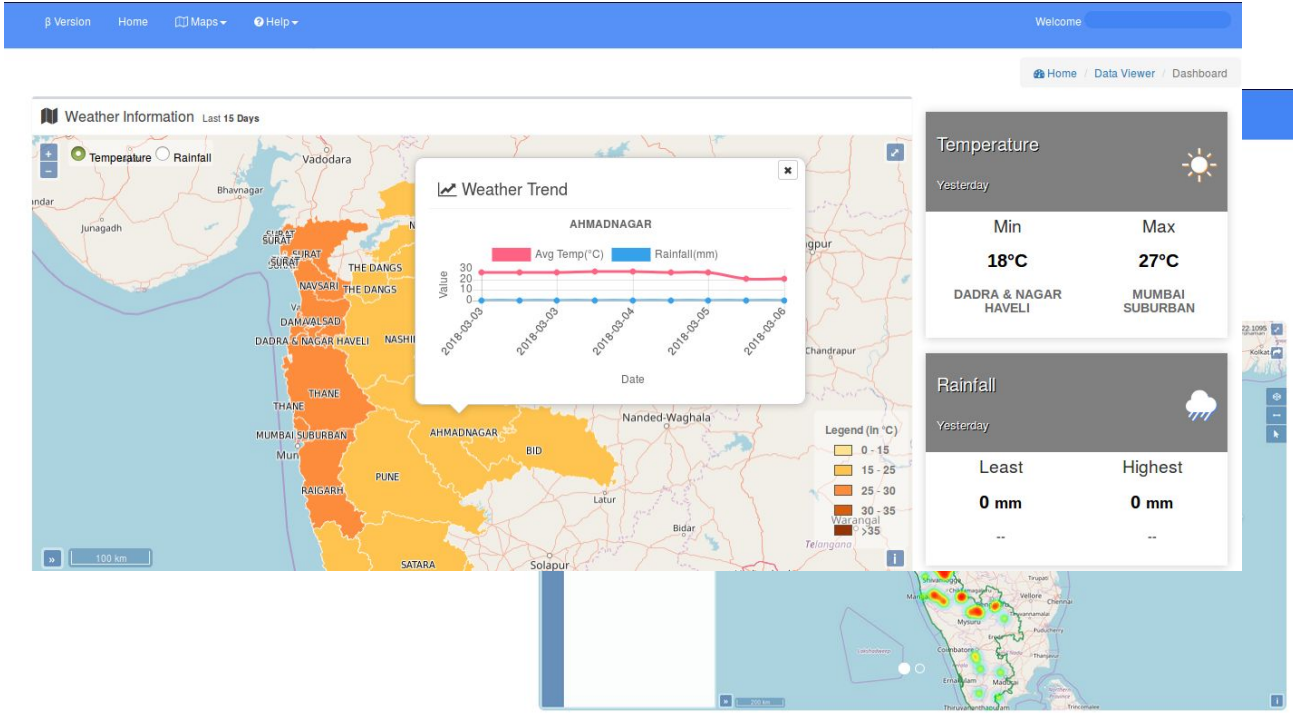
Hand-on

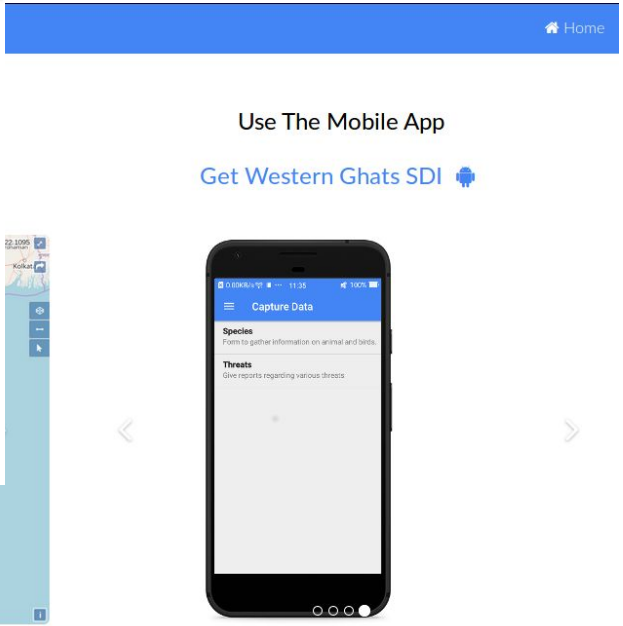
Load sample data into postgres and try the functions listed in the presentation.

kaiinos®

Case studies

Western ghats SDI





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Western ghats SDI

OGC Webservices

All the spatial data has been made available using WMS and WFS webservices as per OGC standards. Registered Users can download data or use the services to perform analysis.

Desktop Access

Data residing in the SDI can accessed from Desktop tools such as QGIS, gvSIG. The WMS and WFS urls can be used to access the data of the SDI.

Crowdsourcing

Along with the SDI, Kriti - an Android based mobile App, has been developed to enable users to post spatial data directly to the SDI. This unique feature enables dynamic updation of this SDI.

Analysis

Web Analytics prototyping for Richness Index has been done and integrated into this SDI. User can visualize the clusters of various species present in the Western ghats on the Web GIS interface.

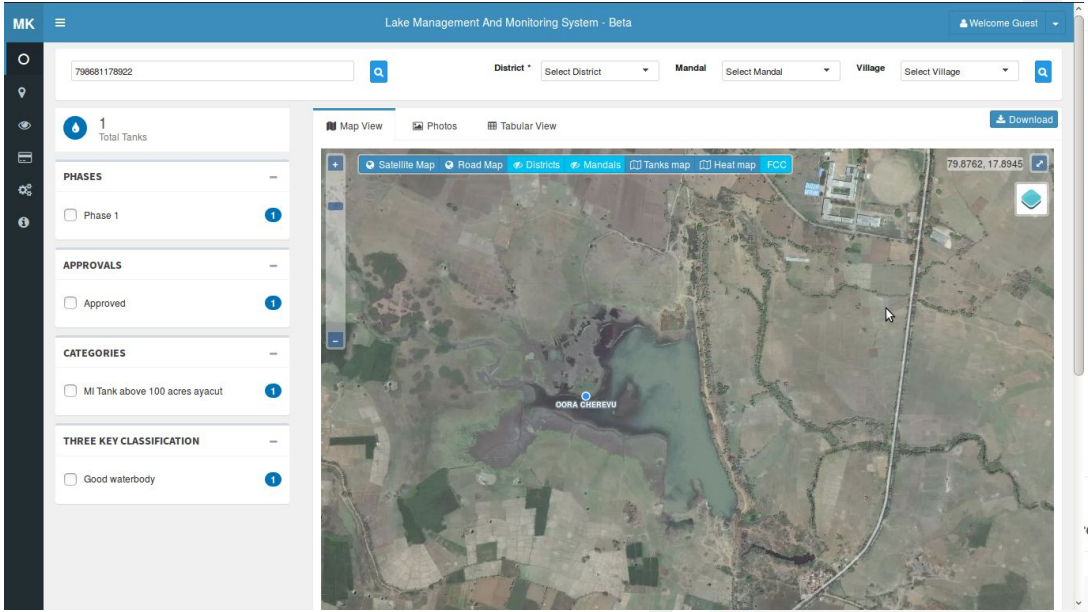
Open Source

In developing this SDI Free and Open Source Software tools for Geoinformatics (FOSS4G) like Geoserver, PostgreSQL/PostGIS, Openlayers have been used.

Interoperability

As this SDI is developed using standard compliant libraries, this SDI can be deployed in all major operating system platforms such as Windows, Linux, MacOS etc. Also this SDI can be customized as a cloud service due to the underlying architecture.

Lake management and monitoring system

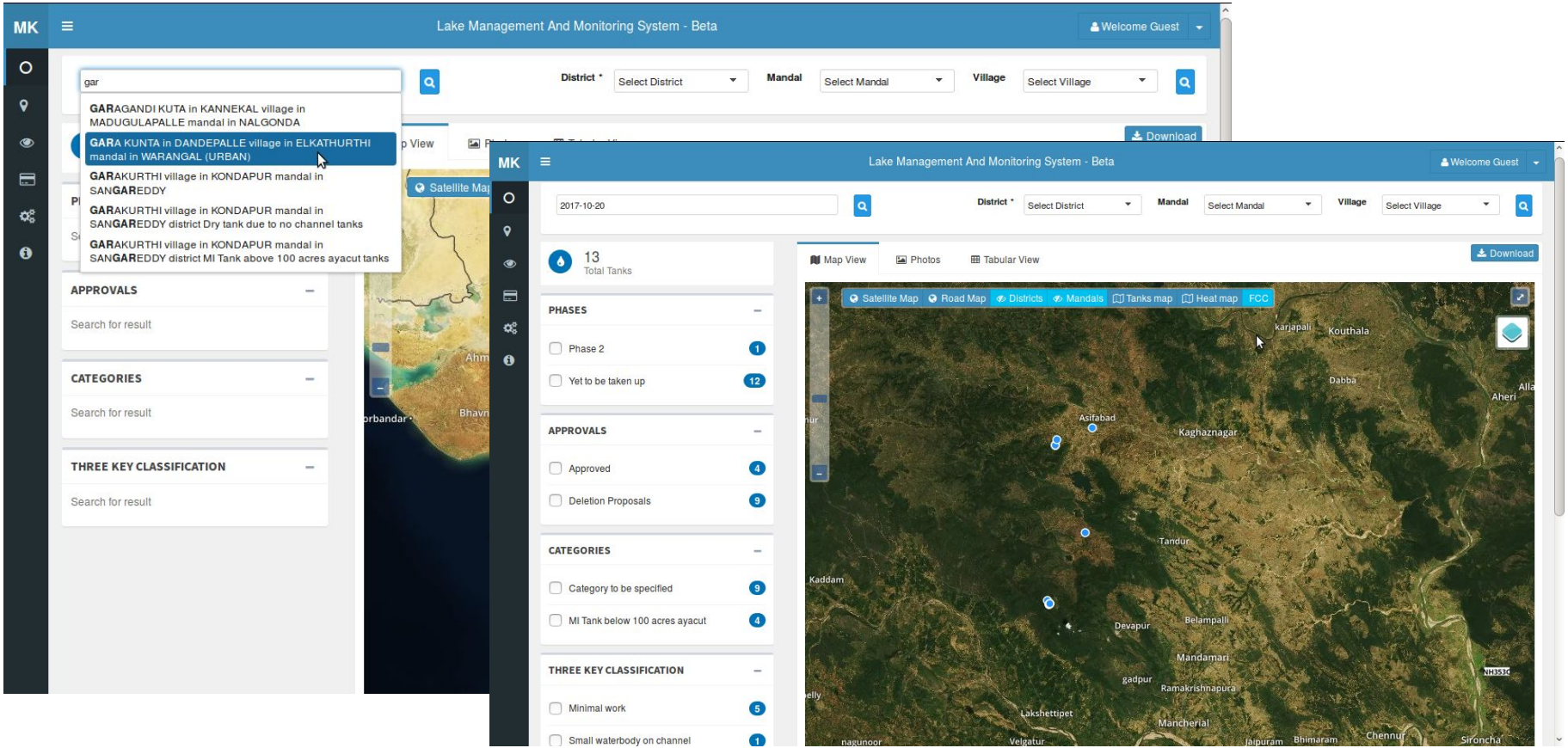


Administrative | Physical | Ayacut | Hydrology Structures | Work Progress Monitoring

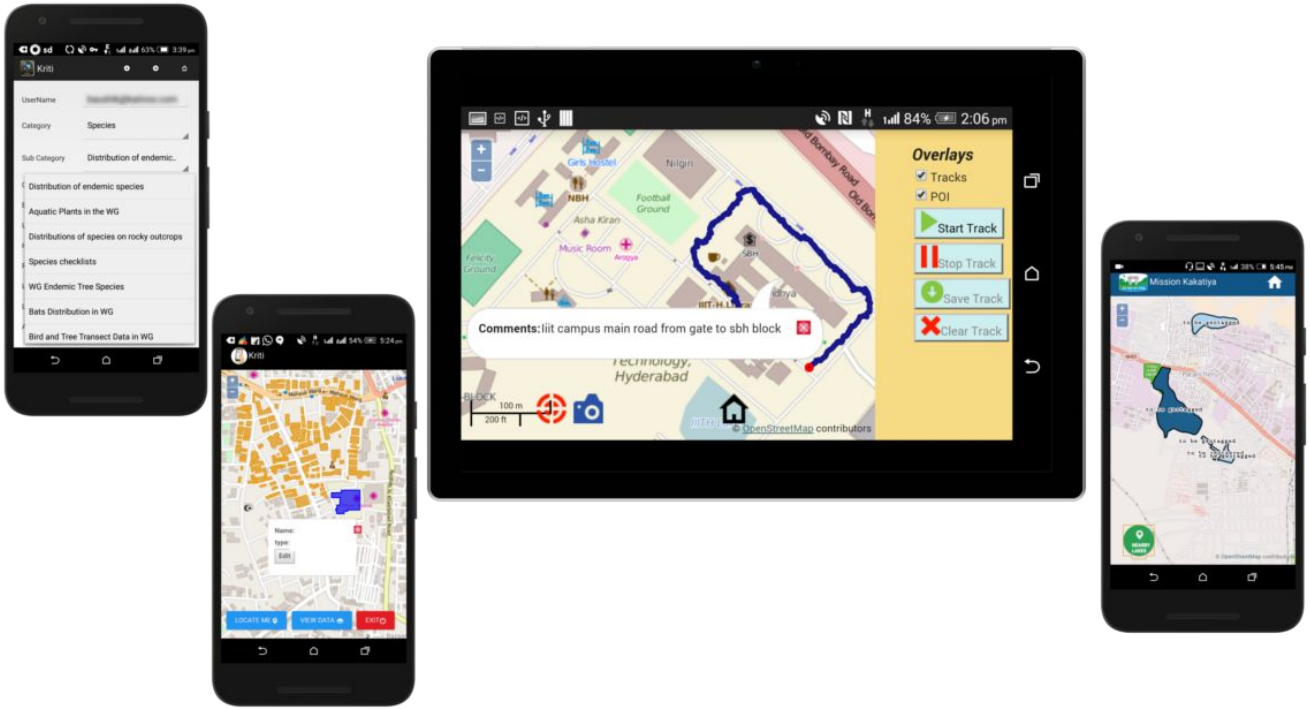
ology Structures | Work Progress Monitoring

	Krishna
Subbasin:	Munneru - K12
Phase:	1
Ayacut area (hectare):	167.18

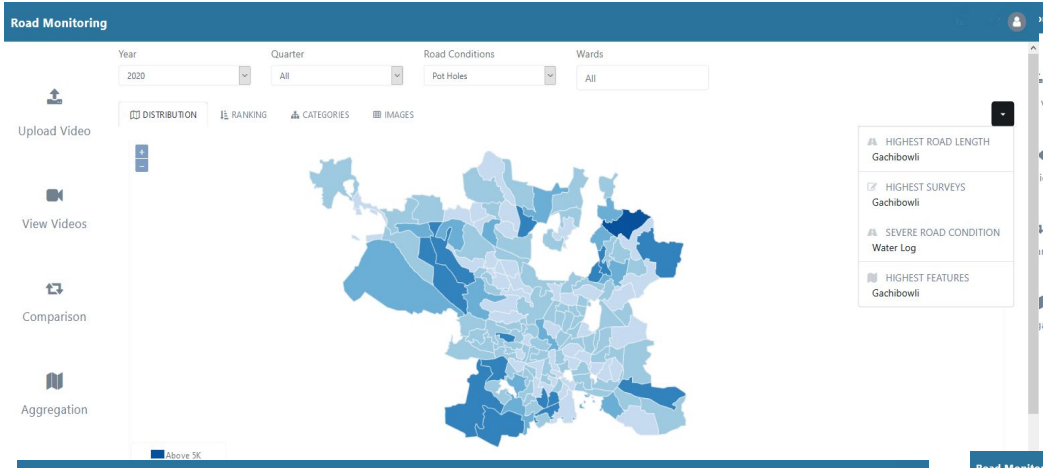
Search engine

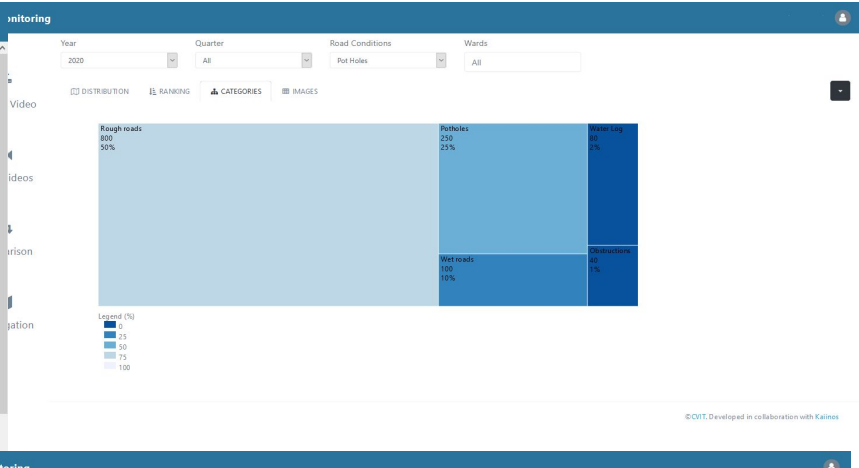


Mobile apps


Kriti
UserName
Category
Species
Sub Category
Distribution of endemic..
Distribution of endemic species
Aquatic Plants in the WG
Distributions of species on rocky outcrops
Species checklists
WG Endemic Tree Species
Bats Distribution in WG
Bird and Tree Transect Data in WG
Kriti
LOCATE ME
VIEW DATA
EXIT
84% 2:06 pm
Overlays
Tracks
POI
Start Track
Stop Track
Save Track
Clear Track
Comments: liit campus main road from gate to sbh block
Girls Hostel
Nilgiri
NBH
Football Ground
Asha Kiran
Music Room
Hyderabad
100 m
200 ft
© OpenStreetMap contributors
Mission Kakatiya

Dashboards


Road Monitoring
Year
2020
Quarter
All
Road Conditions
Pot Holes
Wards
All
DISTRIBUTION
RANKING
CATEGORIES
IMAGES
Upload Video
View Videos
Comparison
Aggregation
HIGHEST ROAD LENGTH
Gachibowli
HIGHEST SURVEYS
Gachibowli
SEVERE ROAD CONDITION
Water Log
HIGHEST FEATURES
Gachibowli
Above 5K


Year
2020
Quarter
All
Road Conditions
Pot Holes
Wards
All
DISTRIBUTION
RANKING
CATEGORIES
IMAGES
Rough roads
800
50%
Potholes
250
25%
Water Log
80
8%
Wet roads
100
10%
Obstructions
80
1%
Legend (%)
0
25
50
75
100
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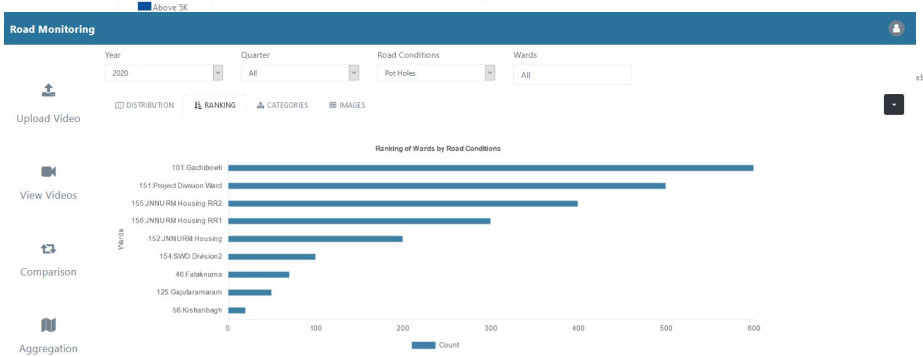
Road Monitoring
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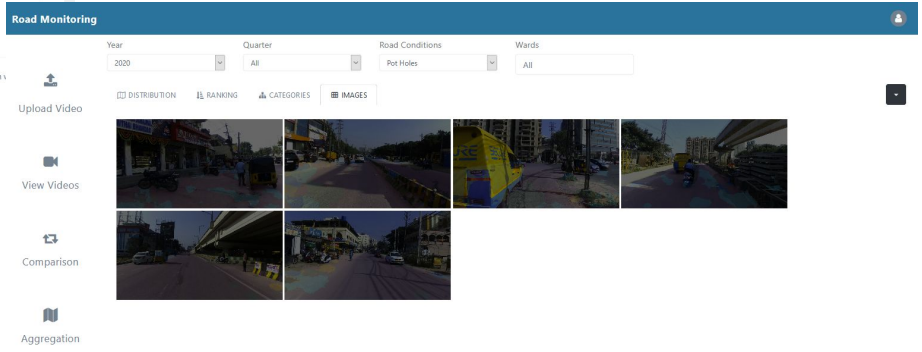
Quarter
All
Road Conditions
Pot Holes
Wards
All
DISTRIBUTION
RANKING
CATEGORIES
IMAGES
Upload Video
View Videos
Comparison
Aggregation
Ranking of Wards by Road Conditions
101:Gachibowli
151:Project Division Ward
155:JNNURM Housing RR2
156:JNNURM Housing RR1
152:JNNURM Housing
154:SWD Division2
46:Falaknuma
125:Gajularamaram
56:Kishanbagh
Wards
0
100
200
300
400
500
600
Count


Road Monitoring
Year
2020
Quarter
All
Road Conditions
Pot Holes
Wards
All
DISTRIBUTION
RANKING
CATEGORIES
IMAGES
Upload Video
View Videos
Comparison
Aggregation