Enabling decision making through webmap apps in an electricity utility

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ABOUT ESKOM

A south African Power Utility

- The largest producer of electricity in the whole of Africa.
- Was formed in 1922 to generate, transmit and distribute electricity to various customers with different consumption patterns and quantities.
- Customers range from residential, agricultural, mining and commercial to electricity redistributors such as municipalities.
- Electricity is generated through diverse technologies using varied resources like coal, nuclear, gas, wind, water and the sun.
- Generation capacity is +/- 45 000MW
GIS HISTORY IN ESKOM...

Spatial platform …late 1980’s

Purpose:
- Assist Land Survey entities in supplying maps efficiently & effectively
- To depict line routes and sites
- To handle statutory applications to build the infrastructure.

Some thoughts were given to other uses……

Spatial platform …late 1990’s

Information Technology / Management accepted as big enablers
- General demand for electricity
- Electrification drive
- Increase in customer base
Distribution and Transmission entered the geographical industry from two view points due to their unique purposes.

Some Gx departments followed…..shortly after

<table>
<thead>
<tr>
<th>Distribution</th>
<th>Transmission</th>
<th>Generation</th>
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<tr>
<td>AM/FM</td>
<td>GIS</td>
<td>GIS</td>
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<td>Based on management of customer growth</td>
<td>Based on the security of the structures on lines</td>
<td>Decentralised systems Analysis</td>
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<td>Optimal operation of the network</td>
<td>Servitude management</td>
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<tr>
<td>Link and connectivity between equipment</td>
<td>Corridor mapping</td>
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GIS HISTORY IN ESKOM…CONT.

Spatial platform …early 2000’s

- Formation of ESI-GIS (GIS CoE)

  Purpose:
  - Acquisition of strategic datasets and services that would benefit all divisions
  - Obtaining the funding to source and manage some of these core dataset.
  - Quality assurance, setting of specifications - ensuring usability to the relevant spatial users and the applications
  - Standardization - Align as close as possible to the South African standards.
  - Adhoc mapping
  - GIS Advisory service
GIS CoE

All Eskom divisions with or without GIS / unique business applications e.g.

- Gx Business
- Tx
- Dx
- Other

External Spatial Data Suppliers of Core Datasets

- SPOT5
- LiDAR
- Cadastre
- etc

External Recipients of Eskom spatial data

- SPOT5
- Eskom networks
- SBC
- etc

Supply core datasets, web-services or other project / services data

Receive business data required for GIS Consultancy Services / SLAs

Supply of Eskom spatial data to external users by GIS CoE

ESVA

Data creation
Data acquisition
Quality checking
Analysis
Modelling
Conversions
Mapping

GIS Spatial System

ESRI ArcGIS Geodatabase

Desktop Users

Spatial Web Services

Sourcing of external datasets (GIS CoE)
THE ESKOM GEOSPATIAL CHALLENGE

1. **GIS information in silo’s**
   - Duplication of efforts
   - Poor management of information (currency, custodianship, maintenance)
   - Different versions of reality

2. **Limited access to information**
   - Desktop GIS (requirements)
     - Know where to get info from

3. **Under utilization of Business Information (BI)**
   - Adding intelligence to location
   - Optimally utilizing resources
   - Exposing a new and different dimension of BI
ADDRESSING THE CHALLENGE
Components of an “open” GIS Landscape

1. **Consolidation of GIS data**
   - Postgres
   - SQL SDE ----- Oracle

2. **ARGIS for Server, Portal for ArcGIS**
   - Self service mapping
   - Desktop GIS accessing web-services
   - Simplification of GIS dependent workflows

3. **Creation of interpretable data stores**
   - Utilization of a service based architecture
   - Shift from client side to server side processing
ENABLING BUSINESS
Enabling Environmental Management: Ingula Pump Storage Hydro Power Station

• Ingula Power Station is located in a environmentally important area.
  - Tracking of environmental incidents, such as bird fatalities is required.
  - Tracking of environmental management interventions, such as vegetation management

• Provide users with an easy to use interface, that is intuitive and require minimal training.

• Provide users with update information.

• Data is stored in secure environment.

• Information that is collected in the field is available for use by Ingula staff for situational awareness and management needs.

• Reporting can be done from the information collected.

• The information collected is available to the rest of the business.
ENABLING BUSINESS
RESPONDING TO BUSINESS NEEDS
Environmental Management

• Eskom has a large number of environmental management professionals that operate over varying environments.
  - Coastal as well as inland areas,
  - Generation, Transmission and Distribution of electricity.
• They have different areas of reasonability.
  - Regulatory,
  - Operational support,
  - Infrastructure development.
• Users required an interface to easily access a variety of datasets.
  - Over 40 layers are accessible.
• All users need to see the same information and be able to highlight areas of interest.
RESPONDING TO BUSINESS NEEDS
ADDING INTELLIGENCE TO LOCATION

Outage Management

- Eskom Distribution Division operate over 200 000 km of power lines.
- Outage management is a key performance area for the business.
- Because of the large geographical coverage of the network it is an area the provides a number of opportunities for GIS to play an enabling role.
- The occurrence of outages is linked to equipment that has a geographic location, however the outage and associated information is not displayed geographically.
- This application provide the ability to visualize outages. Enabling users to:
  - See the location and distribution of outages,
  - The status of an outage
  - The personnel assigned to the outage and their location.
- The application makes optimal use of existing BI and leverages the power of GIS.
ADDING INTELLIGENCE TO LOCATION
LEASONS LEARNT

• You do not need an application in all cases.
  - Web maps on Portal for ArcGIS can meet a variety of needs.
• Allow adequate time for users to understand the capabilities of the system and what they would need.
  - Agile and dynamic development is important.
• Ensure that the organization that the supports the application is prepared.
• Expectation Management
• Ensure that application is scalable.
CURRENT PLATFORM STATUS

• An enterprise GIS has been lunched within Eskom: ESVA
  - Enterprise Spatial Viewing and Analysis provides a high availability environment with an open architecture supported by ESRI technology,
  - Allowing for mission critical applications to be developed,
  - Providing business with the newest technology and functionality,
  - The platform needs to be matured to provide functionality to the enterprise at large.

• GIS needs to be embedded in business process to ensure the flow of data and the utilization of functionality.
THE END