Federal Electricity & Water Authority

Enterprise GIS Implementation for Utility Networks

Presented By
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Agenda

- FEWA Overview
- FEWA GIS Vision
- Enterprise GIS Implementation - Objectives
- Major Stakeholders
- Phase 1 Overview & Achievements
- Phase 2 Scope & Implementation
- Lessons Learned
- Future Plans
- Discussion / Q&A?
FEWA Overview

Production/Transmission/Distribution (Electricity & Water)

FEWA Caters to 5 major regions:
- Ajman
- UAQ
- RAK
- Dhaid
- Fujairah / Dibba

2500+ Employees

FEWA GIS Center (Ajman)
Team Size - 15
GIS Vision in FEWA

“To create a world class Enterprise GIS Center that will serve up-to-date GIS data and support critical business operations of FEWA such as Network Planning, Utility Network Asset Management and Emergency Services”
E-GIS Implementation – Objectives

Phase 1 – (2004 – 2006) - Completed
1. Build Enterprise Utility GIS Infrastructure
2. Project for Ajman Region (Western)
3. Field Data collection and verification
4. Full network documentation
5. Establishing a GIS center
6. Central GIS Database
7. Centralized GIS-based asset editing
8. Web-based information & access
9. Application development (webGIS,NOC)
10. End User Training

Phase 2 – (2008 – Current)
Similar to Phase 1 but extended to other areas -UAQ, RAK, FUJ, DHD, DIB
Major Stakeholders

Internal
1. Survey Departments
2. Electricity & Water: Transmission and Distribution
   1. Network Planning
   2. Operations & Asset Management
   3. Field Crew
   4. SCADA
3. Billing Department
4. Emergency Services

External
Municipalities, Other Utility Providers (Telco, Sewer etc), Contractors, Consultants
End User GIS Requirements

Geospatial information to be used in:
1. Providing New Service Connection for both water and electricity.
2. Maintenance Operations - Network Tracing / Management
   • Find old and repaired utility assets and replace them with new ones
   • Generate reports / Maintenance work sheets
   • Planning Purposes
   • Load Analysis (load accumulation, load switching studies)
   • Network optimization for cost effectiveness
3. Future studies for system planning
4. Sharing Data with other departments
   • Centralized Data Repository
5. Concurrent Editing and Central GIS Database
6. webGIS for Emergency Operations
7. Create and Print Maps at different scales
High Level Solution Architecture

Solution Components Diagram

GIS Center (SCC- UAQ)

GIS Database:
- vector
- Attributes
- Raster

Web/Internet MAP Server:

Plotter

Laser printer

Admin Tools

Digitizer

Network

Ajman Region (WESTERN - A)

FEWA Existing Network

Internet Users (IE)
End users participation such as Field Office Engineers, Surveyors, etc very crucial to the success of the data model.
Data Compilation – Paper-to-CAD

Contractor was deployed to
- Convert old FEWA paper maps to CAD format
- CAD drawings used as reference to start data collection from field
Field Data Collection
Data Preparation - Workflow

Source

Field Data Collection
Scanned Paper Drawings

CAD Drawings

Shapefiles

Process

GIS Data Conversion

Destination

ArcFM UT
Data Model
Electricity Network - Ajman
Water Network - Ajman
Finding Locations
S/S Inplant Components Model
Transformer Attribute
Asset Management - Editing asset data
Network Tracing – Outage Management
FEWA WebGIS
FEWA Map Viewer

Designed to

- Minimize investment on Desktop licenses
- Serve more users
- Easily accessible by Senior Management
Easy Search – Account No
FEWA EGIS Phase 2 - Scope Summary

- Extend Data Collection/Conversion for the remaining regions:
  - RAK Region: (Electricity & Water).
  - Fujairah - Eastern A/B Region: (Electricity & Water).
  - UAQ Region: Electricity.
  - Dhaid - Central Region: (Electricity & Water)

- System Implementation services such as NOC, webGIS

- Upgrade GIS Infrastructure (Hardware, Software, Network etc)
FEWA E-GIS Phase 2 – Main Directions

β Capitalize on what has been achieved so far:
   β The team experience (FEWA & GISTEC)
   β The core GIS system
   β Data model and configuration
   β Coordination procedures between all parties

β Learn from Pilot Area lessons:
   β Data collection
   β Team coordination
   β Pre-requisites, exact user requirements, etc.
   β Time management.

β Implement latest enhancement in GIS Technology including
   ESRI GIS Server, ArcFM UT latest release, etc.
## Phase 2 - Progress

<table>
<thead>
<tr>
<th>Region</th>
<th>Status</th>
<th>Network</th>
<th>Other Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAK</td>
<td>Completed</td>
<td>Electricity &amp; Water GIS Network ready</td>
<td>NOC WebGIS</td>
</tr>
<tr>
<td>UAQ</td>
<td>Completed</td>
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<td>NOC WebGIS</td>
</tr>
<tr>
<td>FUJ/ Dibba</td>
<td>In Progress</td>
<td>Field Data Collection</td>
<td></td>
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Lessons Learned

- Involve the Users, Engineers & concerned departments in system definition. Leads to better Design/Development of the system.

- Executive Management **BUY IN** and Involvement

- Minimize development & customization by using the off-the-shelf technology offering

- Relationship and Transparency

- Manage Stakeholder Expectations well

- Building EGIS is a “Journey” and NOT a “Destination”
Benefits to FEWA & Possible ROI

General benefits of the system:
- Enterprise scalable solution
- Internet/Intranet enabled solution for unlimited number of users

Automated Mapping and Facility management:
- Documenting of the network with FEWA business rules.
- Ability to trace the network and locate assets and isolate problems.
- Ability to prepare engineering designs and drawings.
- Generating reports (BOM) for planned designs.
- Plan and design project less time.
- Rules based system and not to leave it to the user.
Benefits to FEWA & Possible ROI

Operational benefits:

- Using tracing to locate and isolate a fuse or valve.
- The OMS will reduce the need to send many crews to one incident through the TCA.
- Ability to locate asset helps in maintenance and repair.
- All FEWA engineers may view through the IE.
- Custom Applications such as the NOC generation.

Network Facility Documentation
+ mapping
+ data management
+ reg/compliance
+ conduit sys mgt
+ mains replacement
+ tree trimming
+ network analysis
+ joint pole use

Work Orders, Life-Cycle Management
+ manage work flow
+ layout proposed plans
+ analyze options
+ estimate costs
+ produce work packages
+ as-built updating
+ engineering calcs
+ close jobs/post

Customer Care, Trouble Calls
+ manage outages
+ coord priority response
+ support service restoration
+ record outage statistics
+ produce reliability performance reports
Future Plans

- Integrate with other business systems such as EAM, CRM, SCADA, ERP, etc.

Emiratization:
FEWA’s objective is to recruit UAE national and train them to use the GIS system & Applications
Questions ???

Thank you for your Time