ADWEA's Digital Transformation: Geospatial Asset Management

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Agenda

- ADWEA’s GIS Platform Evolution
- Enterprise GIS Upgrade Project
- Smart Grid Roadmap Implementation Plan
- ADWEA’s Integrated Information Systems Vision
  - Geo-Enabled Asset Management
  - Geo-Enabled Executive Dashboard, KPI & Demand Forecast
  - ADWEA’s Portal for ArcGIS
- Alignment with Abu Dhabi Vision 2030
- Future Roadmap
- Q&A
ADWEA’s GIS Platform Evolution
The Strategic Shift Towards a Digital Enterprise to Align with Vision 2030

2001
Enterprise Foundation Implementation

2004
Advanced Operational Stage – GIS in the core of the business with data and application reinforcement & training

2007
Maturity & Business Realization – System implementation across wide user community with growing user expectations, leading to advanced digital business environment & further fine tuning of applications, tools, and infrastructure data
Innovation & Adaptive Management (Phase 1) – System upgrade to be fully business process driven & new technology implementations (3D Modeling, Web GIS, eNOI)

Innovation & Adaptive Management (Phase 2) – Enterprise-wide Service Oriented Architecture (SOA), systems integration, utility network transformation & alignment to Municipal Landbase
GIS as a System of Engagement – Leverage complete GIS Platform across systems, users, and devices to geo-enable the business and deliver insights.

2016 - 2030
Smart Grid Realization – GIS as an integral part of the Smart Grid vision & implementation strategy

2015 - 2018
GIS as a System of Engagement – Leverage complete GIS Platform across systems, users, and devices to geo-enable the business and deliver insights.
Enterprise GIS Upgrade Project – Business Drivers

UPGRADE
GIS Platform Upgrade into latest Mature and Reliable ArcGIS/ArcFM Technology

TRANSFORM & ALIGN
Utility Network Transformation & Alignment based on standard Emirate-wise Municipal Landbase

GEO-ENABLE
Geospatial enablement of Mission Critical Systems: DMS, Oracle Customer Care & Billing, IBM Maximo, Network Planning SW

EXPAND
GIS Expansion & Smart Grid Readiness Solutions (Mobile, Web and Communication Network)

AUTOMATE
Business Process Automation, Executive Dashboards & Reporting
Enterprise GIS Upgrade Project – Overview

- 36 Months
- 88 Business Processes
- 16+ Solutions
- 5 Stakeholder Companies
- 1 System Integrator
- 9 SW Vendors

Business Processes & Network Operations

Geospatial Solutions & Systems Integration
Enterprise GIS Upgrade Project – Main Project Pillars

- Upgrade to ArcGIS/ArcFM 10.2.1 Release
- Ensure Business-driven System Updates
- Support Service Oriented Architecture

- System Upgrade
- Transformation & Alignment
- GIS/DMS Upgrade
- GeoEnable & New Solutions

- Transformation of ADWEA Assets From NAH to WGS84
- Adoption of new LB to eliminate redundant updates
- Align ADWEA Utilities based on new Landbase

- Develop and Configure New Solutions: Geoportal, Web, Dashboard, etc.)
Utility Network Data Transformation & Alignment

- Align with Abu Dhabi Government Initiatives
- Enable Data Exchange with Other Entities
- Reduce Redundant Landbase Updates

ADOPTED METHODOLOGY

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Data Assessment

- POC
- Production (Offline & Online)

ADOPTED METHODOLOGY

- Adopt recent Landbase developed by DMA in WGS84
- Transform ADWEA Assets from Nahrawan67 to WGS84

ALIGNMENT

- Align ADWEA Utility Networks based on new Landbase
- Maintain High Accuracy
- Consider Effects on GIS-Dependent Systems (DMS, CC&B, Maximo)
- Do Not Disturb Daily GIS Ops.
- Ensure Optimal Transition Time

Average Distributed Shift

Align with Abu Dhabi Government Initiatives

Enable Data Exchange with Other Entities

Reduce Redundant Landbase Updates

Accurate Shifting

Maintain High Accuracy

Consider Effects on GIS-Dependent Systems (DMS, CC&B, Maximo)

Do Not Disturb Daily GIS Ops.

Ensure Optimal Transition Time

5.5M Assets

250K Assets

Utility Network Data Transformation & Alignment

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GIS / DMS Interface Upgrade

- Segregate GIS from DMS to Minimize Dependencies

- Optimize GIS / DMS Interface by:
  - Reducing Overall Processing Time
  - Attaining Daily Synchronization
  - Re-Engineering GIS / DMS Interface

- Rectify Landbase Alignment Effect on DMS

- Ensure No Time Interruptions on the GIS and DMS Operations

IDENTIFIED AREAS OF IMPROVEMENT

- Workflow & Procedure
- Core SW Upgrade
- Process Re-Engineering
- HW Upgrade

~70% Overall Improvement in Processing Time
ADWEA’s Present & Near Future Grid Architecture
With Small-Scale Pilots and Demonstrations

Unidirectional Power Flow

Bidirectional Power Flow
ADWEA’s path to Smart Grid is driven through a well-crafted vision and implementation strategy ...
ADWEA’s Vision of Integrated Information Systems

Integrated Communication Cloud

Smart Generation
- Solar Power
- Wind Power
- Energy Storage Program (BESS)
- Electric Vehicles
- Distributed Energy Resources

Smart Network
- Customer Care & Billing (CC&B)
- Geographic Information System (GIS)
- IBM MAXIMO
- Enterprise Service Bus
- Load Dispatch Center (LDC)
- Distribution Management System (DMS)
- Meter Data Management System (MDMS)
- Outage Management System (OMS)
- Network Management System (NMS)
- Real Time & SCADA Service Bus

Smart Consumpt
- Home

Intelligent Network Devices
- Substation Automation
- Smart Meters
- LV Automation
- Condition Monitoring

Residential Loads
- Electric Vehicles

External Initiatives
- SHAMS
- NOOR
- Nuclear Power
- Wind Power

ESTIDA
- MA
- Demand Side Management
- Energy Storage Program
- Electric Vehicles
- Electric Vehicles
- TABREED

IBM MAXIMO

Outage Management System (OMS)

Enterprise Service Bus

Load Dispatch Center (LDC)

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Electric Vehicles
Geospatial Enablement & New Solutions

- Implement Business Process Driven Geospatial Solutions
- Upgrade Mission Critical Applications
- Integrate Silo Systems Using Service Oriented Architecture
- Expand Solution Offering to Meet Smart Grid Readiness Targets
- Meet e-Government Initiatives and Enable Data Exchange with Other Government Bodies

**SOLUTIONS DEVELOPMENT STRATEGY**

- COTS Solutions & Products
- Web Platform Technology (where applicable)
- Configuration vs. Customization
- Iterative Deployment & Testing

**Foundation**
- GIS: ArcGIS / ArcFM, QA/QC, Web Viewer, Reporting Management, Mobile Solution

**Planning:**
- PSS-SINCAL, SLD Generation, Hydraulic Modeling, Demand Forecast Asset Management: Maximo, Primavera, Document Mgt, CAD Integration, Communication

**Operations:**
- SCADA/DM S, CC&B, Field crew and Mobile
Geo-Enabled Asset Management

- Maximo Spatial Configuration
- Two-way Asset Synchronization
Geo-Enabled Executive Dashboard, KPI & Demand Forecast

- Executive Dashboard and Reporting Engine
- Performance Management and KPI Dashboard
- Geo-enabled Electric & Water Demand Forecasts
Web Solutions

- ADWEA's Portal for ArcGIS
- Operations Dashboard and Other Web Maps
- ADWEA Web Viewer based on ArcFM Server & ArcFM Silverlight Viewer
Mobile Solutions

- Extend Geospatial Data to Field Users
- Support Multiple Platforms (Windows, iOS & Android)
- Task Oriented Functions & Business Process Dependent
- Receive Work Orders, Inspect Assets on Site, Perform Field Verification
- Solutions Include: ArcFM Mobile, ArcGIS for Windows Mobile, Collector for ArcGIS, Portal for ArcGIS, ADWEA Web Viewer, Augmented Reality Field Solution
ADWEA’s Alignment with Abu Dhabi Vision 2030

**Economic Development**
Becoming business-focused to respond to economic diversification and investments in new projects.

**Social & Human Resources Development**
Enhancing workforce management through mobile GIS solutions and measuring performance.

**Infrastructural Development & Environmental Sustainability**
Shifting from regulated commodity energy firm to low-carbon network operator through integrated and digital networks.

**Optimization of Government Operations**
Aligning with government initiatives, such as Unified Municipal Landbase and integrating systems to improve efficiency.
Future Roadmap
ADWEA’s GIS Vision for 2030

- Developing Integrated Information Systems that support an Integrated and Smart Network (SCADA/DMS, eAM and AMI) with Smart Generation (Renewables) and Smart Consumption (Demand Response, Electric Vehicles, DSM & Storage)

- Meeting Government Regulation & Supervision criteria and KPIs (by reducing time for Electricity & Water connections, initiatives for sustainable Water and Electricity consumption, reducing total losses, visualizing performance measures (SAIDI, SAIFI…),....)

- Geospatially enabling business processes to increase transparency and effectiveness

- Enhancing Data Update Processes through stringent Physical Network Synchronization between the Field and GIS early in project construction phase

- Implementing workforce management through mobile GIS solutions and improving workplace health, safety & welfare

- Enabling Data Transfer and e-Government Integration to respond to government electronic initiatives and plans
ADWEA’s Vision of Integrated Information Systems

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  - Real Time & SCADA Service Bus
- Smart Consumption
  - Smart Home
  - Demand Side Management
  - Energy Storage Program (BESS)
  - Electric Vehicles
  - Residential Loads
- Initiatives
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THANK YOU!