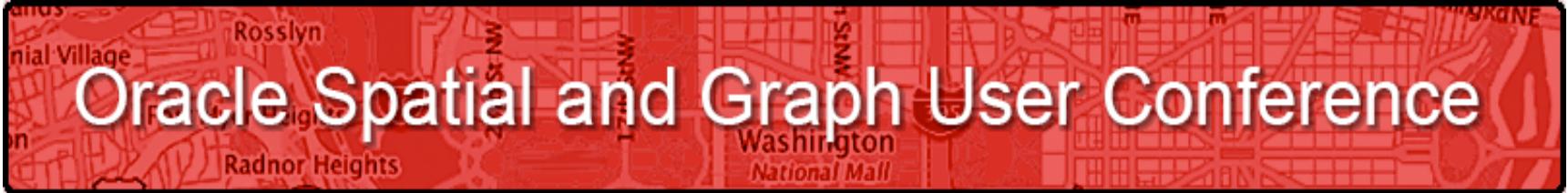




May 2013  
Oracle Spatial and Graph  
User Conference

**ORACLE®**



# Oracle Spatial and Graph User Conference

May 22, 2013  
Ronald Reagan Building and International Trade Center  
Washington, DC USA



# **Sarel Coetzer**

Oracle Spatial Developer,  
**Gijima**



# South Africa integrated eCadastral



# Gijima South African eCadastre System

## OVERVIEW

- Centrally managed, authoritative database
- Incorporates 8 Provincial cadastral datasets
- Integrate NGMS and Title Deeds office system, spatial and non-spatial
- Supports title deed transactions and maintenance of new eCadastre
- Incorporating 300mil title deeds documents in TIFF format, scanned.
- Maintain and process 20mill exponential growing land parcels
- Provide platform to securely transact and audit properties

## CHALLENGES / OPPORTUNITIES

- Need to sustain 100 thousand possible daily property transactions
- Sustain over 20 million public users
- Need to facilitate all NGMS offices spatial operations real time
- Need to provide spatial data to public, land surveyors, city planners
- Provide an Open Spatial Data platform for other departments and municipalities

## SOLUTIONS

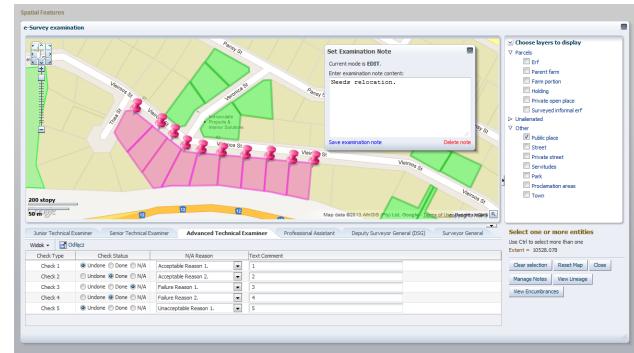
- Oracle Database 11g Release 2, Oracle Spatial and Graph, Partitioning, RAC, WMS, WFS
- Oracle Identity Management
- Oracle Universal Content Management, URM, IBR, SES, ODC
- Oracle Fusion Middleware, MapViewer, Weblogic
- Oracle Business Intelligence Enterprise Edition

5



## RESULTS

- Consolidated national Cadastre
- SA government has single spatial repository to perform spatial queries and get monthly feedback
- Standardized all addresses and coordinates in a consistent format and datum
- Nationwide association of title deeds documents to land parcels
- Improved precision thereby making system more useful to the public and business
- Manage SA Cadastre from a centralized managed platform
- Improve local economy



**Gijima**  
Technology People



# Program Agenda

- About Gijima
- Introduction
- NGMS and Deeds business
- Solution eCadastre
- Oracle technology in eCadastre
- Challenges
- Future
- Conclusion
- Q&A



# Gijima

[www.gijima.com](http://www.gijima.com)

- South African Information Technology company listed on the JSE.
- Complete IT partner with Oracle
- Client base of large technology users in both the public and private sectors
  - Financial services, retail market, manufacturing, mining, telecommunications as well as National and Provincial Government departments and State-owned enterprises.
- Core Ideology
  - **Vision Statement**
    - *To be widely recognized as the South African black owned company that transformed into a global technology solutions leader*
  - **Core Purpose**
    - *To design technology solutions, which enable enterprises to achieve great goals*
  - **Core Values**
    - In everything we do: *Integrity, Care, Transparency and Respect*



# Introduction

The Department of Rural Development and Land Reform (DRDLR)

Vision:

Revolutionize the South African Cadastre to an integrated automated eCadastre by integrating

- National Geomatics Management Services (NGMS)
- Deeds Registration (DR)

Main Drivers:

<b>- Standardization</b>	<b>- Paperless</b>	<b>- Completeness</b>	<b>- Accuracy</b>
<b>- Automation</b>	<b>- Optimizing</b>	<b>- Integration</b>	<b>- Secure</b>
<b>- Agile</b>	<b>- Managed</b>	<b>- Accreditation</b>	<b>- Self funding</b>

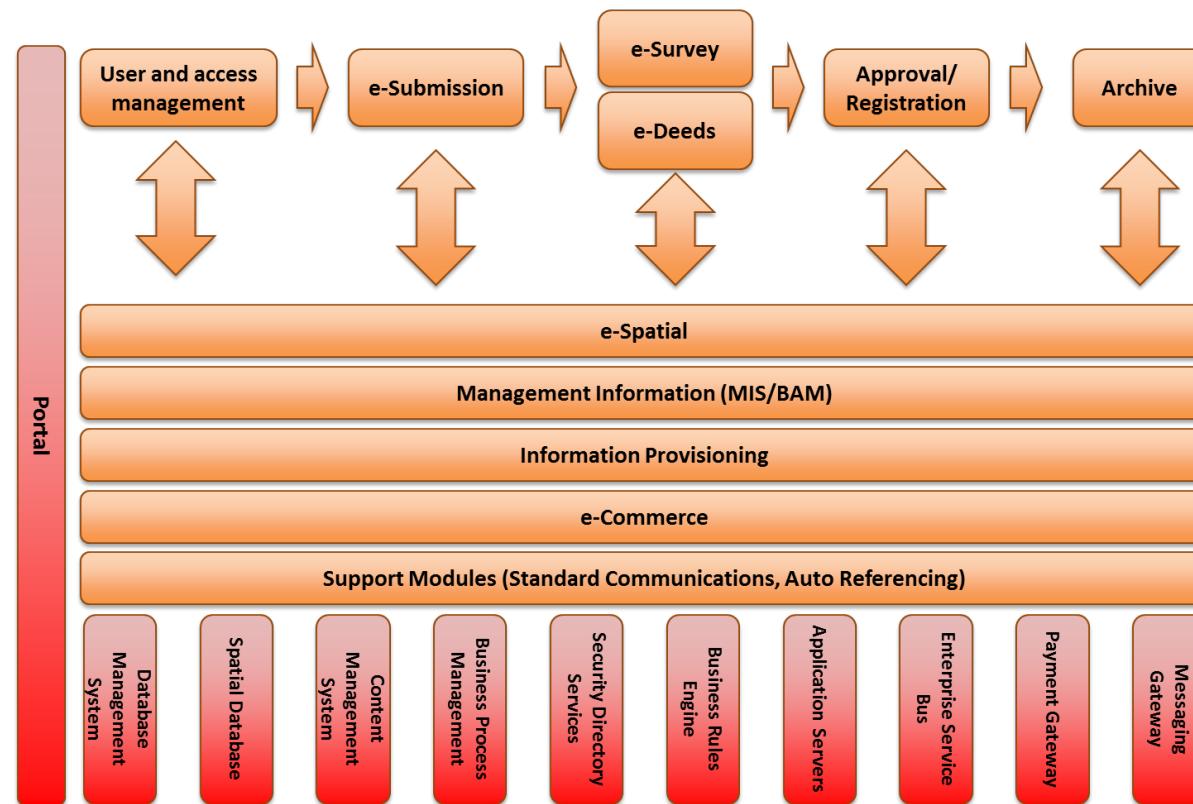


# NGMS and Deeds business

- National Geomatic Management Services (NGMS)
  - Examine and approve all cadastral surveys
  - Update South African Cadastre
  - Maintain spatial boundary and legal surveyed documents
- Deeds
  - Title deed registration
  - Management and maintenance of the property registry
  - Register parcel to legal owner



# eCadastre Solution

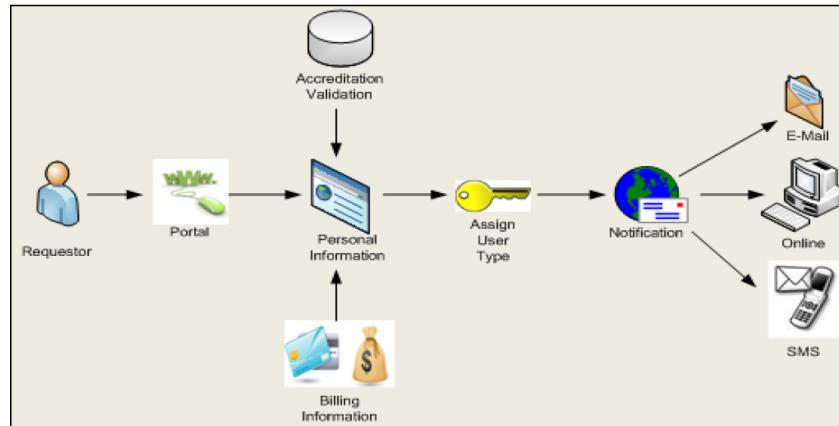




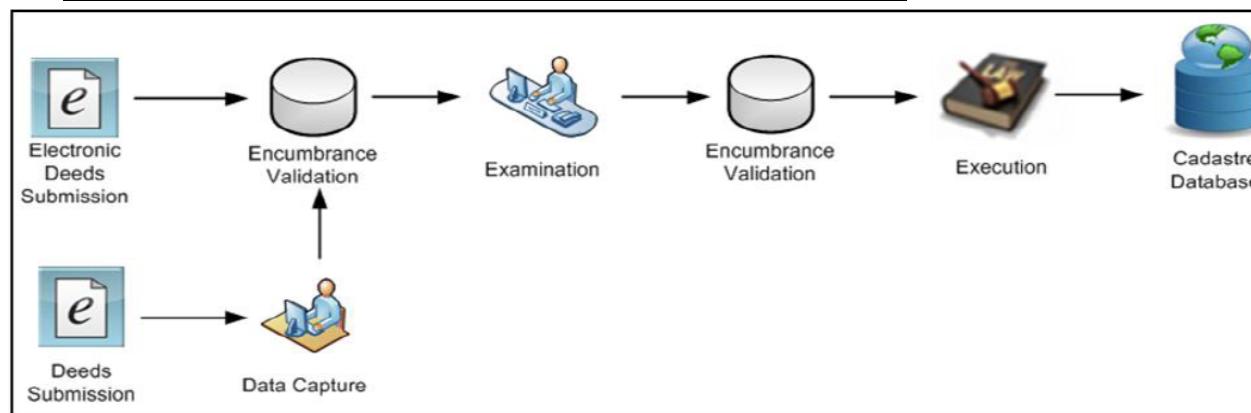
# Solution eCadastre

## Business Processes

- User Registration



- Deeds Approval

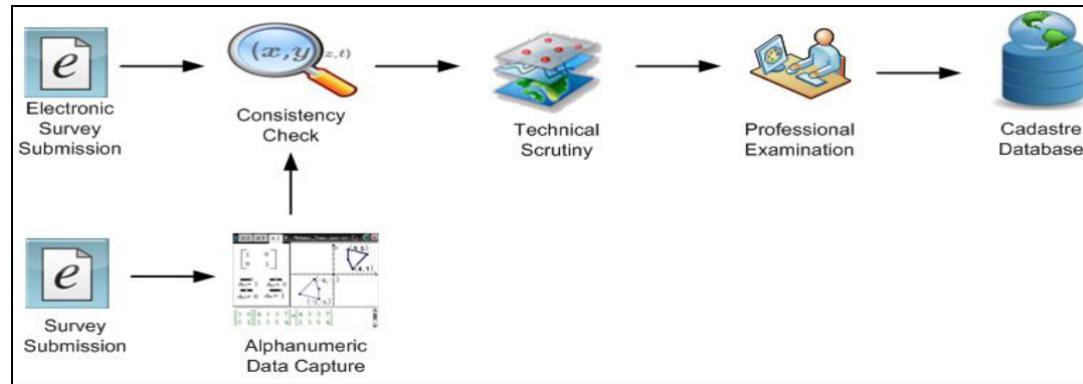




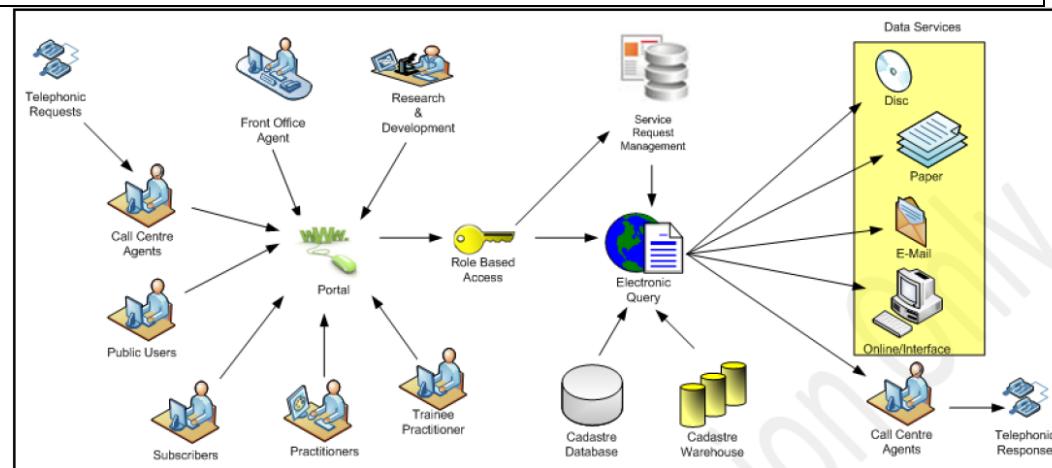
# Solution eCadastre

## Business Processes

- Survey Approval



- Information Provisioning



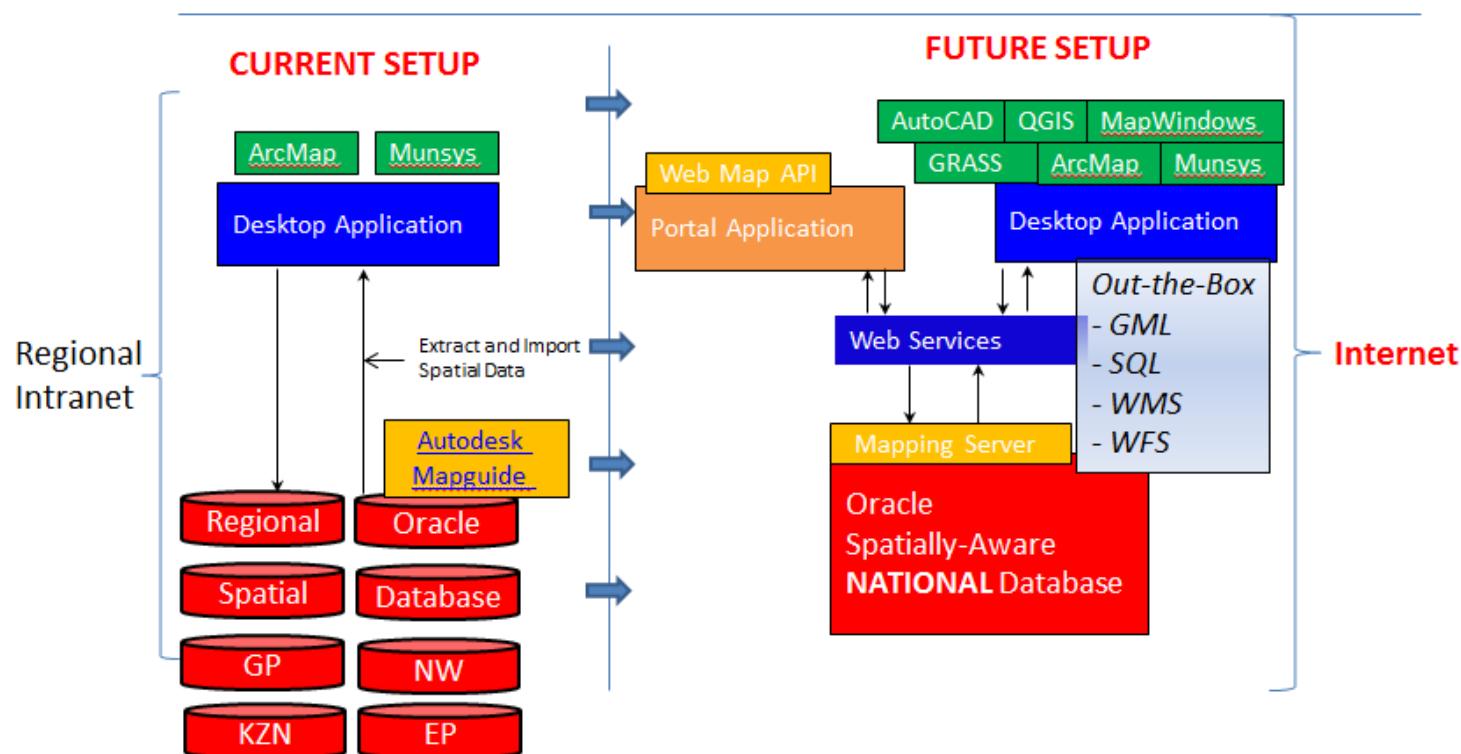


# Solution eCadastre

## Spatial Component

Yesterday

Today





# Solution eCadastre

## eSpatial Dissection

- Portal
  - Frontend for various components
  - Application Access, Users login, Daily stats
- Oracle Database 11g Release 2 with Oracle Spatial and Graph Option
  - 3D ready / Partitioned
  - WMS/WFS
  - GeoServer
- Oracle Fusion Middleware MapViewer API
  - Client-side interaction vital in web portal
- Google Maps API
  - Provide Geocode
  - Backdrop Data



# Solution eCadastre

## eSpatial Development

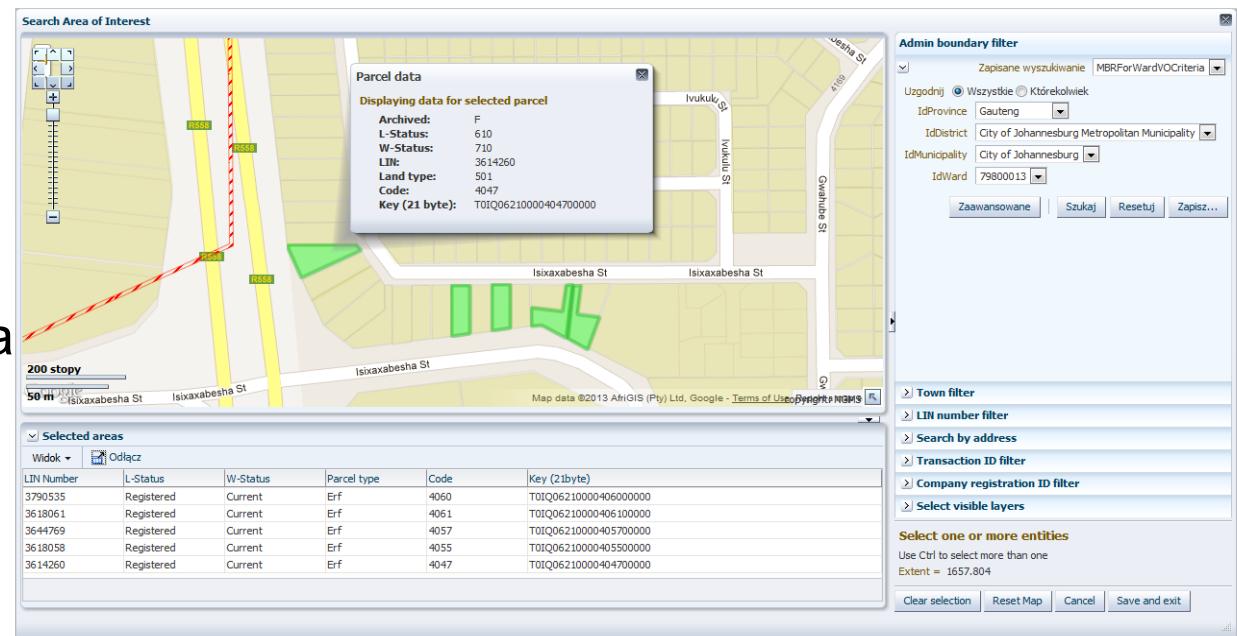
- Oracle JDeveloper (ADF) IDE
- MapViewer API
- ADF Mapviewer API not sufficient
- Google Maps API
- CHALLENGE
- Interaction between Google API and MapViewer API
  - Address Search (Geocoding)
  - Accessing Google libraries
  - Loading Google Map via MapViewer
  - Can't access Google API



# Solution eCadastre

## eSpatial - Select Area of Interest

- Transaction is reserved
- Property selected
- 5 Search Engines/Filters
- View parcel attribute data
- View title deed
- View SG diagram
- Add additional layers





# Solution eCadastre

## eSpatial – Survey Examination

- Survey submitted
- Multiple examiners notes
- Spatial notes
- View property attributes
- Add layers
  - Servitudes
  - Roads
  - Beacons
- Property validated

A screenshot of the eSpatial Survey Examination software. The main window shows a map of a residential area with streets like Vleiroos St, Thes St, and Pansy St. A specific property is highlighted in pink, and several pink pushpins are placed on its boundary. A callout box titled "Set Examination Note" is open, containing the text "Needs relocation." with "Save examination note" and "Delete note" buttons. To the right, a sidebar titled "Choose layers to display" lists various land use categories like Parcels, Unplanned, and Other. The "Other" section is expanded, showing checkboxes for Public place, Street, Private street, Servitudes, Park, Proclamation areas, and Town, with "Public place" checked. At the bottom, a table titled "Select one or more entities" shows five rows of examination data, with the "Advanced Technical Examiner" role selected. The table columns are: Check Type, Check Status, N/A Reason, and Text Comment. The rows are: Check 1 (Undone, Done, N/A, Acceptable Reason 1, 1), Check 2 (Undone, Done, N/A, Acceptable Reason 2, 2), Check 3 (Undone, Done, N/A, Failure Reason 1, 3), Check 4 (Undone, Done, N/A, Failure Reason 2, 4), and Check 5 (Undone, Done, N/A, Unacceptable Reason 1, 5).

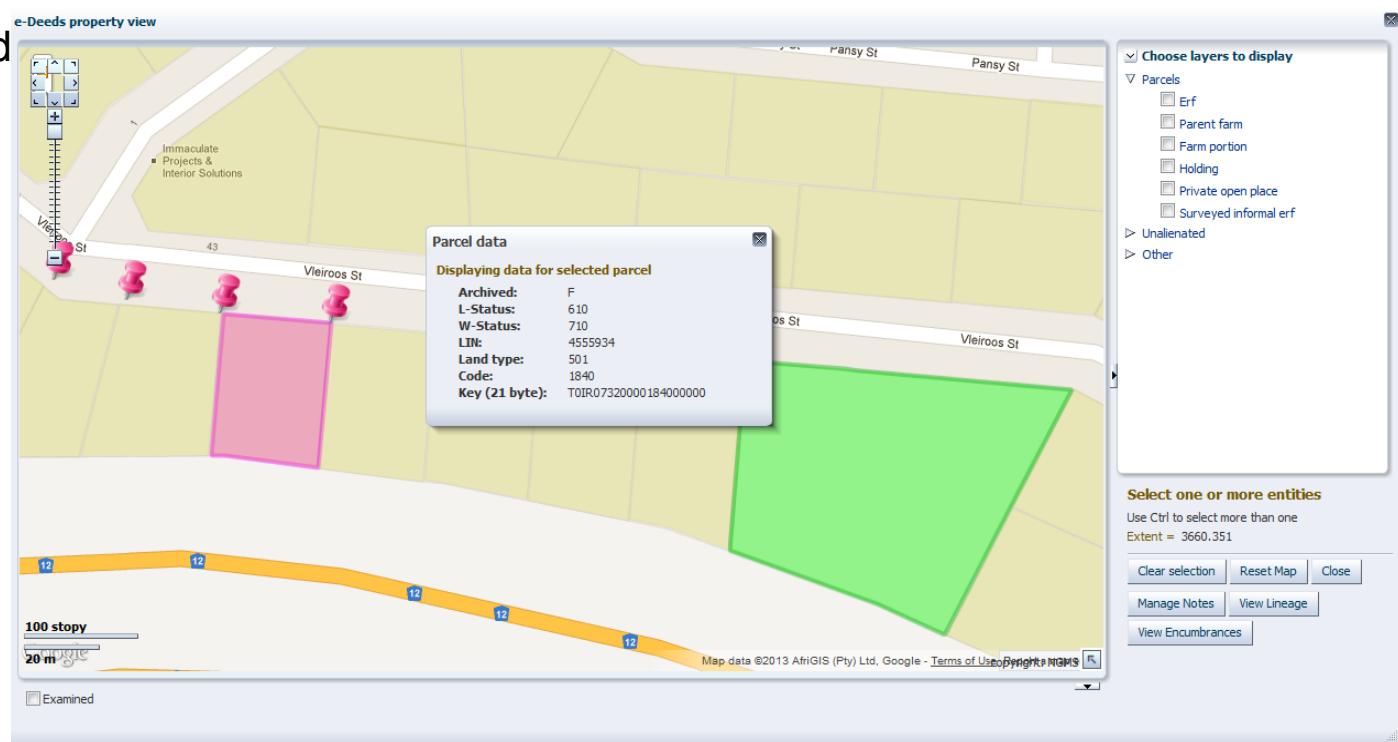
Check Type	Check Status	N/A Reason	Text Comment
Check 1	<input checked="" type="radio"/> Undone <input type="radio"/> Done <input type="radio"/> N/A	Acceptable Reason 1.	1
Check 2	<input type="radio"/> Undone <input checked="" type="radio"/> Done <input type="radio"/> N/A	Acceptable Reason 2.	2
Check 3	<input type="radio"/> Undone <input type="radio"/> Done <input checked="" type="radio"/> N/A	Failure Reason 1.	3
Check 4	<input type="radio"/> Undone <input checked="" type="radio"/> Done <input type="radio"/> N/A	Failure Reason 2.	4
Check 5	<input checked="" type="radio"/> Undone <input type="radio"/> Done <input type="radio"/> N/A	Unacceptable Reason 1.	5



# Solution eCadastre

## eSpatial - Exam Property Transaction

- Transactions are viewed
- Spatial notes are read
- Transaction types are noted
- Add layers
  - Servitude
  - Beacons
  - Roads
- Parcel attributes
- SG diagram
- Title deeds

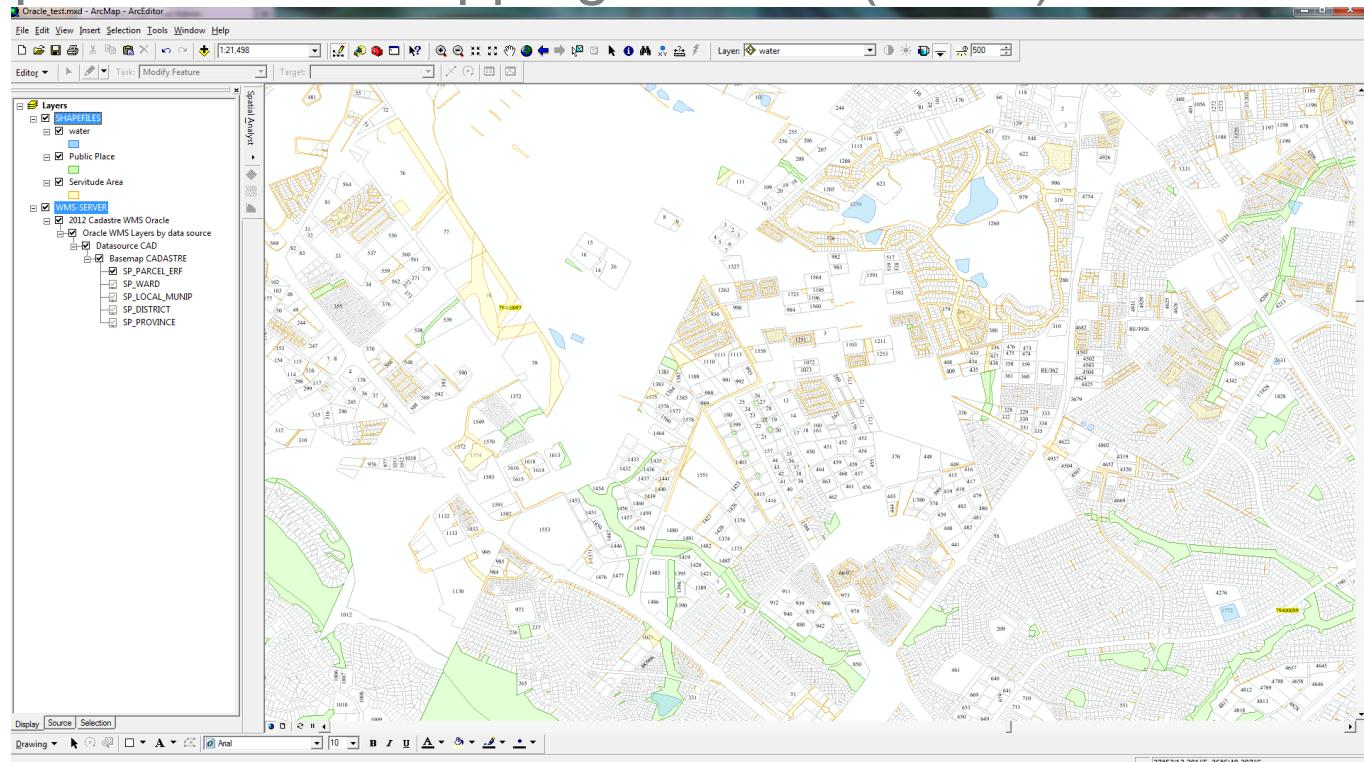




# Solution eCadastre

## eSpatial - Web Mapping Service (WMS)

- Enable WMS
- Load WMS in GIS
- Add local layers
- Construct maps
  
- Public use
- Any GIS application
  - ESRI ArcMap

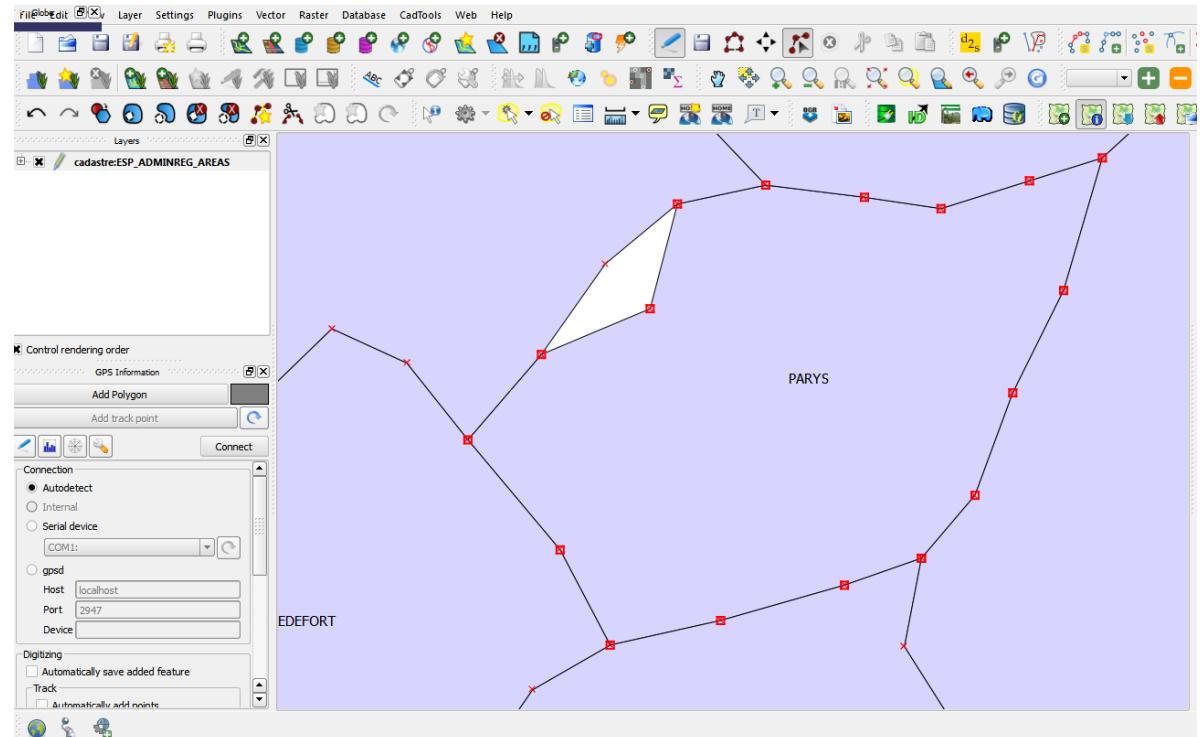




# Solution eCadastre

## eSpatial - Web Feature Service (WFS)

- Enable WFS
- Load feature layer
- Feature manipulation
- Read/Write geometry
- Spatial analysis
- Maintain topology
- Read/Write attributes
- Add layers
- Produce analytical maps
- Public use
- Secure use
- Any<sub>20</sub> GIS application - Q-GIS

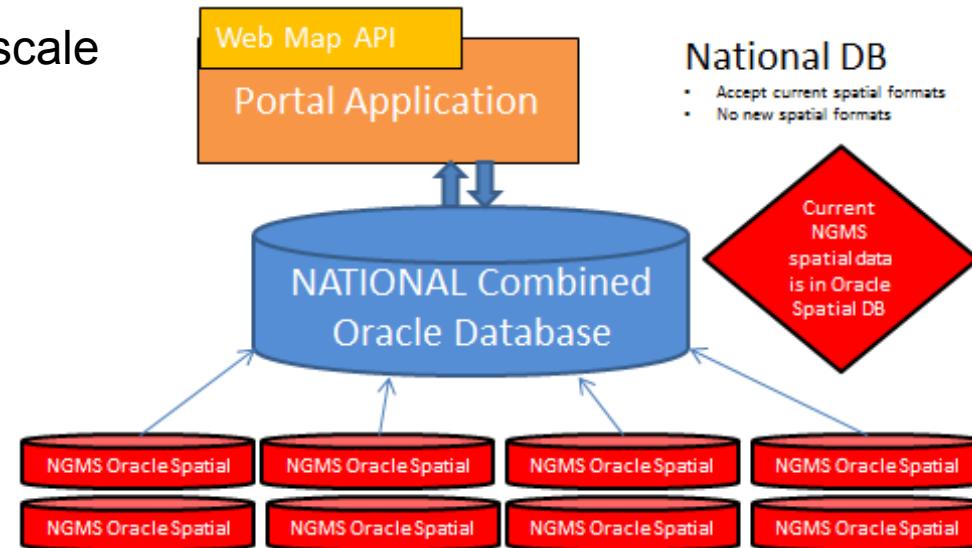




# Solution eCadastre

## Final Solution

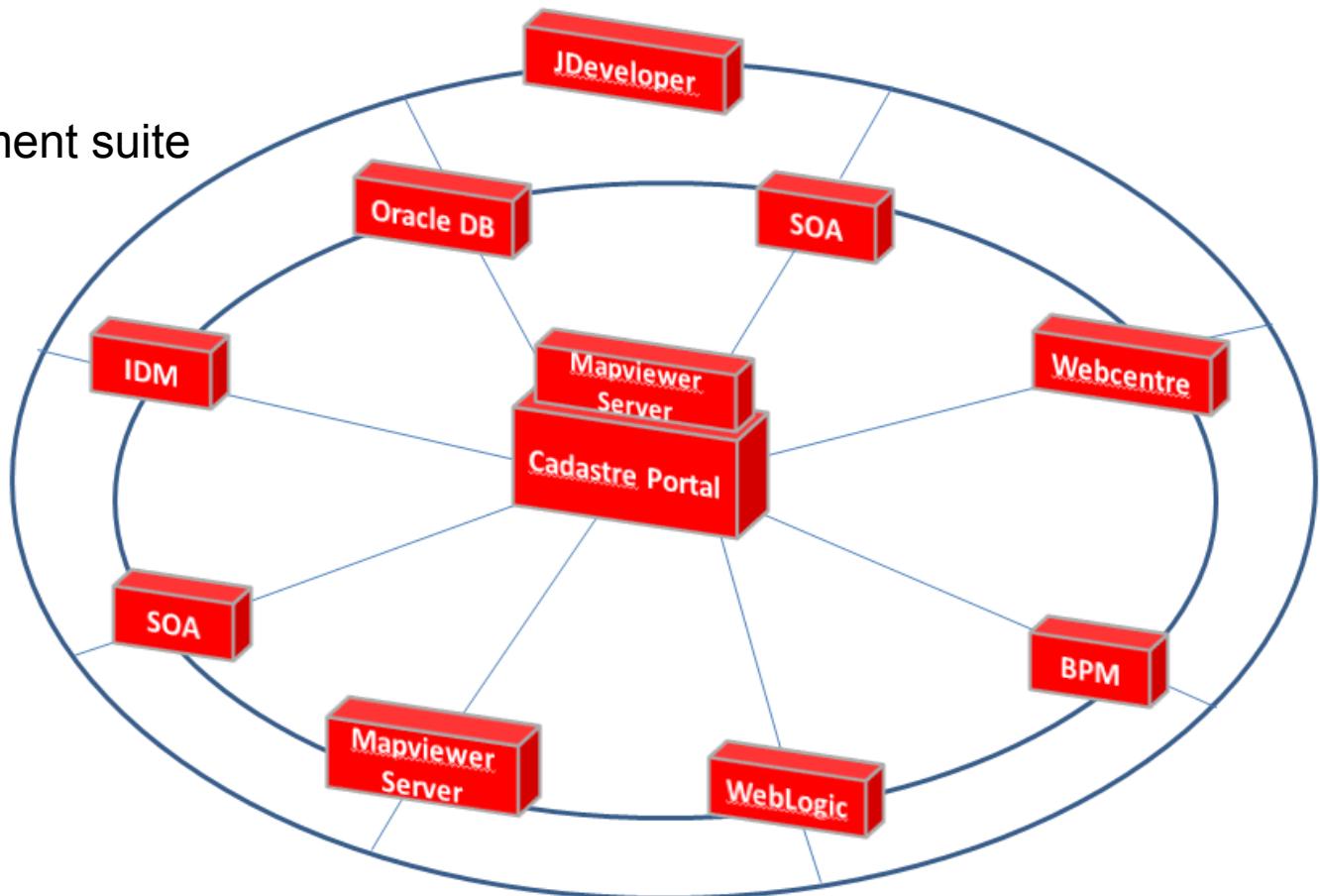
- Africa and South Africa 1<sup>st</sup> eCadastre
- Centralized state
- Spatial analysis on National scale
- Land distribution improved
- Improve development





# Oracle Technologies

- Gijima development suite





# Challenges

- Using various API's
  - Google Map API for Geolocation
  - MapViewer API (outside JDEV)
- Application Integration
  - Various API's into JDEV
- Prepare system for 3D
- Keep Reporting and Analysis in mind
  - Endless possibilities with spatial analysis
  - National Scale
- Planning land use and land distribution



# Future

- Improve Cadastre accuracy
- Improve data quality and service delivery
- Investigate 3D capabilities
- Interact with Open platform products
- Acquire more stakeholders
- Broadened use of Oracle and Oracle Fusion Middleware MapViewer
- Mobile-Cadastre



# **Sarel Coetzer**

## Oracle Spatial Developer

**D E M O N S T R A T I O N**

# **Gijima**

# **eSpatial**

# Q&A