

A Centrally Managed GIS System for Protection of the Romanian Archaeological Sites and Historical Monuments - *eGISpat*

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Overview

- Challenges
- The architecture
- Components
- Capabilities
- Conclusions

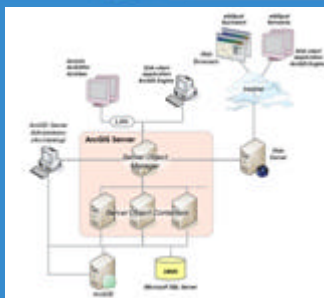
Challenges

- For over 4 years, the National Institute of Historical Monuments (INMI) – compile and maintain **LHM 2004** (List of Historical Monuments)
- 2005, INMI decided to replace an existing tabular only system stored in Microsoft Access
- The lack of the homogeneous, organized, national information system of the national cultural heritage represents the main argument for the implementation

Challenges

- To provide a centrally managed GIS system and advanced analysis of a national-wide cultural heritage resources
- To create a unique network to exchange data between different organizations and Ministry of Culture and Religion
- Better decisional support and easier access to the primary information related to historical monuments

eGISpat – Enterprise Architecture



eGISpat Components

- Geodatabase Model of LHM 2004
 - includes 18.516 monuments (national/international relevance) and 5.108 monuments (local importance)
 - from typological point of view LHM 2004 includes 1.762 ensembles and 4.040 architectural and archaeological sites
 - Law no. 422/2001, LHM are structured in four category: *archaeology, architecture, funerary-memorial architecture and public.*

eGISpat Components – cont.

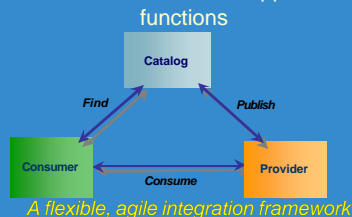
- Geodatabase Model – feature classes:
 - *Monumente*: a point feature class representing historical monuments
 - *Situri*: a polygon feature class including archaeological sites
 - *Ansambluri*: a polygon feature class identifying the extent of archaeological ensembles
 - *Localitati*: a polygon feature class representing the settlements
 - *Judete*: a polygon feature class identifying the extent of the administrative limits
 - *Drumuri*: a line feature class representing the road network
 - *Cai ferate*: a line feature class representing the railroad network
 - *Rauri*: a line and polygon feature class identifying the hydrographic network
 - *Dunarea*: a polygon feature class representing the Danube Delta

eGISpat Geodatabase Model

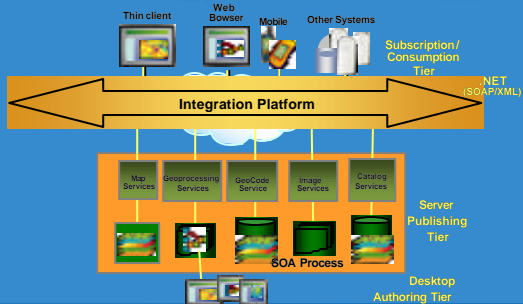


Service-Oriented Architecture

- Definition
A method of integrating business applications that utilize common services to support business functions

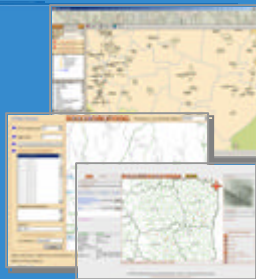


GIS Services – eGISpat Romania



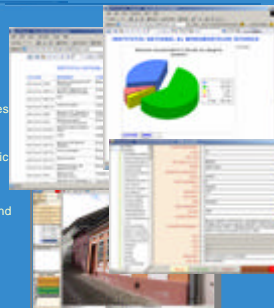
eGISpat Romania functionalities

- Focus on the map
- Save a map document as raster files
- Features
 - Identify
 - Search/Find
 - Select by pointing
 - Find/Select with SQL expression
 - Display labels with text from field values
- Draw
 - Graphics features such as point, lines and polygons
 - Descriptive text
- Built-in map navigation
 - Pan, zoom in/out
 - Zoom to full extent
- Coordinate system transformation



eGISpat Romania functionalities

- Select features and generate reports
- Perform
 - Geometric operations on shapes to create buffers
 - Advanced spatial and attribute queries
 - Geodatabase management tasks
- Geodatabase
 - Add/Delete image files and geographic features
 - Validate entering values during the editing process
 - Create/Update geographic features and their attributes



eGISpat Bucharest

- The historical centre was determined and legally declared as a protected area in 2001
- Buildings are grouped in: commercial / functional / residential area
- Large variety of architectural programs:
 - Royal residence called "Curtea Veche" represents the main pole of the medieval town
 - Churches (Stavropoleos, Sf. Gheorghe Nou, Sf. Gheorghe Vechi, Coltea, Doamna)
 - Inns (Hanul lui Manuc, Hanul cu Tei, Hanul Polonezilor, Hanul Patria)
 - Houses with shops at the ground floor and lodgings above
 - Dwelling places
 - Public and cultural institutions built-up between 19th – 20th century
 - Hospitals (Coltea, PTTR- the hospital of the Romanian Postal Services)
 - Commercial enclaves (the Maza - Viteazescu arcades and French passage way)
 - Hotels (Fiaschi Hotel)
- Severe damages – fire incident in 1847 / several earthquakes

eGISpat Bucharest

- Web GIS application was built using ArcGIS Server 9.1 technology
- Represents a planning tool to help planners and preservationists to better assess the historical and cultural resources
- Incorporates:
 - Historic resources
 - Digital map of Bucharest, scale 1:2,000
 - IKONOS satellite imagery courtesy of GeoEye
 - Registration files
 - Plans, building footprints
 - Streets, sidewalks, rivers, etc.

eGISpat Bucharest capabilities

- Built-in map navigation
 - Pan, zoom in/out
 - Zoom to full extent
 - Moving back / forward one display
- Draw
 - Graphics features such as point, lines and polygons
 - Image, descriptive text
- Features
 - Identify
 - Search/Find
 - Select inside boxes, areas, polygons, circles
 - Find/Select with SQL expression
 - Display labels with text from field values
- Interactively toggle layers on/off



eGISpat Bucharest capabilities

- Print maps, size A4
- Select features and generate reports
- Manipulate the shape or rotation of map
- Perform
 - Geometric operations on shapes to create buffers
 - Advanced spatial and attribute queries
 - Geodatabase management tasks
- Geodatabase
 - Add/Delete geographic features
 - Image files management
 - Validate entering values during the editing process
 - Create/Update geographic features and their attributes



Conclusions

- 1st Phase: create a centrally managed GIS system
- 2nd Phase: INMI will be applying for additional funding to field check the existing geodatabase information and to perform additional surveys
- 3rd Phase: GPS measurements using Trimble GeoXT, GeoXH Recon GPS card and ArcPad

"eGISpat application represents for INMI the first step to create and implement an enterprise GIS system that will be applied to the national historic resources inventory. Building a national network regarding to the cultural heritage seems to be a stringent necessity and, in the same time a future desire for us. Using a geodatabase model will allow us a better management of the National Archaeologic Directory and also the List of the Historical Monuments", says Dr. Dana Mihai, Scientific Director, INMI.

Conclusions

- eGISpat Benefits:
 - Significant operational and risk-cost reductions
 - A centralized archaeological geodatabase
 - Directly access for advanced spatial analysis and mapping
 - All departmental staff are able to work in a centrally managed GIS environment
 - Advanced GIS web services are delivered throughout organizations
 - eGISpat is a performant tool for decision makers at the national level
 - Support the geospatial specifications and standards required by European Community
 - Geodatabase model offers a better support to follow administrative, rehabilitation and preservation tasks
 - Enterprise GIS architecture enables the implementation of the sectorial policies and strategies

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