INFORMATION AND ANALYTICAL SYSTEMS IN MANAGEMENT OF NATURAL RESOURCES: PROBLEMS AND SOLUTIONS

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VNIIGEOSYSTEM

Russian large research and development institute in the field of fundamental and applied studies of the Earth, providing the geological and ecological industry with the state of the art experimental and production technological equipment and processes
Main objectives of information-analytical systems (IAS) in management of exploration and exploitation of natural resources

Creating and maintaining a unified geological information resources

Information support for monitoring of exploitation of mineral resources and environmental protection

Information and analytical support for planning the study and exploration of natural resources

Receiving, analyzing and aggregating information on the various levels of government management of subsoils with the generating of material for the regulated and unregulated reporting (fact sheets, reports, thematic maps, analytical diagrams, etc.)
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Basic software components of IAS

- Databases
- Data engines and services
- Client applications for input, edit and processing data
- Geographic information systems
- Tools and services for analysis, data mining, decision support
- Report tools
- Specific tools (forecast, modelling, etc.)
Basic software components of IAS

Number of different software and plugins

Different development platforms and program languages

Many licenses

Many technologies

Many developers

High cost

Need to integrate

Hard to support
Development of IAS: main problems

- “Float” specification
- Heterogeneous source data (structured, unstructured, spatial, expert, etc.)
- Need of support of different platforms (Windows, Web, Mobile, etc.)
- Need of integration with existing systems and databases
- High cost of software and solutions
- Limited time and professional resources
New technological approach to development of IAS: basic principles

- Single development environment for all components, incl. GIS
- Maximum simplifying the development process
- Support all phases of life cycle of IAS: projecting, developing, supporting
- High flexibility to changing specifications and requirements
- Cross-platform
- System and data integration possibilities
Technological platform for the rapid development of the information and analytical systems
Main features

- Based on integration of most effective models of life cycle of IAS development – prototyping, rapid application development (RAD), increment model
- Full visual approach to the client applications design without the need of the writing of the program code
- Common approach to the creating of the client desktop and web applications
- Advanced tools for the aggregation, processing and analysis of the heterogeneous data (incl. OLAP, Data Mining, Decision Support)
- Open architecture for the integration between IAS Constructor and the third-party applications, extendable plug-ins support
- Spatial data built-in support and integration with the third-party geoinformation systems (GIS)
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Single development environment for different components and tools

IAS Constructor Environment

- Forms
- Queries
- Diagrams
- SIG
- File Documents
- Reports
- OLAP
- File Documents Storage Master
- Reports Generator
- OLAP Editor
- Chart Editor
- Query Wizard
- Form Editor

IAS Constructor
Full Visual Approach To The Client Applications Design: Universal For Desktop And Web

Visual components library

• Interface graphic elements
• Data access and data controls
• Actions and events
Full Visual Approach To The Client Applications Design: Example
Software Development Models:
prototyping, rapid application development (RAD), increment model
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Architecture

Server
- Meta Data
- Data Storage
- Data View

Web Server

INTERNET

LAN

Desktop Client
- Queries
- Forms
- Diagrams
- GIS
- Reports

Web Client

Web Client
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Spatial data supporting

GIS

Desktop

Web

Plug-ins

Internal GIS-component

External GIS
Deployment:
Russian Federation, Republic of Kasakhstan
Information and analytical system of mineral deposits of Russian Federation
Information and analytical system of mineral deposits of Russian Federation

Database information:

- State Cadaster of mineral deposits of Russia
- State Balance of reserves and production of mineral deposits
- Geological Data
- Technical and economical evaluation of mineral deposits

System results:

- Evaluation of geological exploration
- Support for production planning of mineral resources
- Assessment of investment potential of mineral deposits for government and business
Information and analytical system
Monitoring of groundwater
Monitoring of licensing of mineral deposits exploration and mining
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Monitoring of oil and gas fields exploration and exploitation
Our Suggestions Of Collaboration

We are looking for partners to

- Further developing and marketing of our products and technologies
- Creating applications and solutions in natural resources management, ecology monitoring, spatial data processing, remote sensing, etc.
- Joint educational programs

Collaboration variants

- Manufacturing Agreement (Subcontracting & Co-contracting)
- Technical Co-operation
- Joint Venture Agreement
Thanks for your attention!