

# ADASPHERE

## CAPABILITIES STATEMENT

### INTRODUCTION

Demonstrating professional creativity, unique insight, and technical excellence, Adasphere applies modern tools, techniques, and best practices to develop timely solutions to interesting problems.

### THE PATH TO SOLUTIONS

Adasphere provides enterprise system consulting services to commercial and government organizations. We specialize in geographic information systems (GIS) technology and focus on the architecture and implementation of line-of-business and real-time systems in the fields of environmental science, military intelligence, installation management, and transportation.

Our experience is the convergence of technology management and the application of leading-edge innovation, software patterns, and best practices. Adasphere offers high-yield, low-risk professional, analytical, and technical services. Our breadth of knowledge is a side-effect of working with various experts in different, sometimes fascinatingly obscure, disciplines.

Our mission is to provide lasting solutions to challenging problems. We maintain unique perspectives by working side-by-side with very knowledgeable subject-matter experts from diverse backgrounds. Our strategy aims to expose the next-generation of technical solution patterns, employ flexible best practices, and nimbly adapt to major paradigm shifts. Our vision is that Adasphere, through the application of interdisciplinary technical evangelism and spatial-temporal technology, will play a major role in solving a ubiquitous problem faced by humankind.

### GEOGRAPHIC INFORMATION SYSTEMS

Adasphere offers geographic information system (GIS) solutions including application development and the collection, synthesis, analysis, and dissemination of geospatial data. If you need support exploiting your organization's geospatial assets, Adasphere can help.

### GIS DEVELOPMENT

Adasphere applies sound practices in the development of GIS software and systems. Whether you require an extension to ArcMap or ArcCatalog, a stand-alone GIS application, or a web-based mapping solution, Adasphere offers a variety of existing

components, code, and techniques to expedite a solution. Adasphere can also embed GIS technology into legacy applications, encapsulate spatial-temporal elements of existing systems, or implement enterprise-class, standards-based, service-oriented, and spatially enable solutions that are truly modular in nature and sustainable through time.

Adasphere offers a large menu of GIS technologies:

ESRI Extension Development: ArcMap™, ArcCatalog™, ArcScene™, ArcGlobe™, ArcToolbox™

ESRI ArcGIS Server™

ESRI ArcIMS

ESRI Database: ArcSDE via Oracle, SQL Server

Oracle™ Spatial: 8i, 9i, 10g

Geography/Vector Grammars: KML, GML, ArcXML, VML, SVG, VRML

Javascript Mapping APIs: Virtual Earth™, Google™ Maps

ESRI ArcObjects Technologies: COM, .Net

Other Languages: Arc Macro Language (AML), Avenue

Application Engineering: PCI Geomatics, ERDAS Imagine, SocketSet

## **DATABASE DESIGN**

The database is the backbone of any geographic information system. If you are developing a new system or aim to integrate geospatial depth into your organization, Adasphere's knowledge and experience will give you an edge. Adasphere can design, stabilize, and optimize your enterprise-class geospatial database. We employ the best features of ESRI ArcSDE™ with Oracle™ or SQL Server™. Want XML? Try KML, GML, or a GeoRSS feed as the data structure for your customized Google Earth or Virtual Earth application.

## **DATA COLLECTION**

We believe you should save your money and use freely available data found in the public domain, when possible. We always begin our data collection efforts by reviewing free and reliable sources.

Adasphere offers GPS field data collection, heads-up digitization, and online acquisition of geospatial data. Sources include orthophotography, satellite imagery, output from scientific models, and various vector formats. Adasphere converts data such as CAD files and non-spatial business tables. We also author and update FGDC-compliant metadata.

## **SPATIAL DATA SYNTHESIS**

Synthesis is the fusion and integration of disparate geospatial data sources. Adasphere uses advanced techniques and models to create unified results that are reproducible

and designed for the enterprise. Quality and relevance are imperative. We can help you ensure the integrity of your geospatial assets using industry standards: Content Standard for Digital Geospatial Metadata; National Map Accuracy Standards; and the Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE).

## **GEOGRAPHIC ANALYSIS**

The power of a GIS lies in its ability to relate dissimilar information in a spatial context from which conclusions can be reached. What is the relationship between asthma and upwind air pollutants? What is the economic cost of noise pollution from a military installation on the surrounding community? Is land use transformation through development sustainable for a given area? What communities will be impacted by sea-level rise? We can help you answer complex questions with geospatial analysis.

## **MAP PRODUCTION AND DELIVERY**

Adasphere applies timeless cartographic principles and artistry when creating maps. We can provide you hard copies varying from inset maps for articles or presentations to wall sized maps used at conferences or summits. You may also need digital maps that are fully interactive and embedded into Adobe Acrobat documents, Microsoft PowerPoint presentations, or integrated with your existing software applications. Adasphere also builds geospatially enabled web applications using ESRI ArcIMS, ESRI ArcGIS Server, Google Earth, Virtual Earth, or a combination thereof. Maps can also be delivered in a 3D virtual environment for enhanced visualization and simulation.

## **SOLUTION DEVELOPMENT**

Adasphere offers analysis, design, implementation, and maintenance support for various types and scales of software projects. During the overall development, we evaluate your requirements for scalability, security, fault tolerance, interoperability, and speed to determine the appropriate physical and logical architectural pattern for your organization. The customer demands also determine the most sensible software development methodology to use (if at all).

### **ANALYSIS**

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- Structure
- Processes
- Services
- Objects
- Aspects

### **DESIGN**

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- Presentation
- User Interface
- Business Logic
- Data Access

- Infrastructure

#### IMPLEMENTATION

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- Web Applications
- Web Services
- Windows Services
- Desktop Applications
- Application Extensions

#### MAINTENANCE

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- Troubleshooting
- Refactoring
- Optimization
- Support
- Training

### MULTI-ORIENTATION ANALYSIS

Adasphere performs analysis from multiple simultaneous perspectives: structural-, object-, process-, aspect-, and service-orientation. With our rapid and insightful analyses, you are able to quickly see common concerns across a business or system. A potential side-effect of multiple-oriented analysis is useful business insight into your organization's mission, vision, values, culture, structure, and strategy. You may also recognize great opportunities to increase effectiveness, implement better practices, or exploit technology. Adasphere analyses produce substantive requirements, dynamically transforming insight into a shared vision of a complete solution.

### 5 TIERS OF DESIGN

Adasphere offers 5 tiers of design services: presentation, user interface, business logic, data access, and infrastructure. In more complex subject-matter domains, we will implement domain-driven and model-driven design techniques and assuredly involve domain experts throughout the entire project.

#### PRESENTATION

The presentation tier includes layout and graphic design typically associated with the look-and-feel of a web site or application.

#### USER INTERFACE

The user interface tier contains the workflow or process design, which concerns user and system interactivity, events, and notifications.

#### BUSINESS LOGIC

The business logic tier is the abstract model or representation of the business domain, where we often find class libraries and domain-specific APIs (Application Programming Interface). During the design of the business logic layer, we evaluate any short- or long-range plans to deliver functionality on other types of clients (e.g. web, tablet PCs,

mobile phones, etc.) Reusability and commercialization are major facets to business logic design.

## DATA ACCESS

The data access tier design focuses on the mechanisms to create, retrieve, update, and delete raw data. This could involve anything from using data-binding software components to writing stored procedures on a relational database.

## INFRASTRUCTURE

The infrastructure design includes the logical and physical location of hardware and processes, how they communicate, and the mechanisms for crossing process boundaries.

Infrastructure design also includes the design of data persistence: sequential (e.g. binary), hierarchical (e.g. XML), or relational (e.g. RDBMS). Our multi-scaled entity-relationship models offer excellent visual communication between domain expert and database designer.

Adasphere also provides XML taxonomy services and can help you reuse existing, industry-standard schemas for your purposes.

## IMPLEMENTATION

Adasphere provides software implementation services. We can install and configure existing third-party software components or provide custom programming. We offer services for various types of client applications: web applications, desktop applications, windows services, web services, and application extensions. Consequently, Adasphere has substantial knowledge, experience, and skills in a vast collection of computer programming languages and associated technologies.

**COMPILED LANGUAGES: C, C++, C#, VISUAL BASIC 6, VB.NET™, JAVA**

**INTERPRETED LANGUAGES: PHP, VB SCRIPT, COLD FUSION, JAVASCRIPT**

**DATABASE SCRIPTING: SQL, T-SQL, PL/SQL**

**MARK-UP LANGUAGES: XML, XSL, XPATH, XHTML, XSD**

**WEB SERVICE GRAMMARS: WSDL AND SOAP**

**GEOGRAPHIC/VECTOR GRAMMARS: GML, ARCXML, VML, SVG**

**CLIENT-SIDE TECHNOLOGIES: CSS, DOM, AJAX**

**SERVER-SIDE TECHNOLOGIES: JSP, ASP, ASP.NET, PHP**

**FRAMEWORK TECHNOLOGIES: COM, DCOM, .NET, J2EE**

**DATABASE TECHNOLOGIES: SQL SERVER™, ORACLE™**

## MAINTENANCE

Adasphere can help your organization improve existing technology assets. Whether it's troubleshooting a persistent problem, creating a back-up/recovery plan, mitigating potential risks, or cleaning up some legacy code, Adasphere can help you streamline your organization. We also provide support for unique circumstances and facilitate knowledge transfer from our employees to yours through group training or one-on-one mentoring.

## PORTFOLIO

Adasphere has participated in a wide range of projects often involving highly specialized disciplines. These projects include air quality, installation management, asset inventory, enhanced 911 implementation, facility utilization, land record systems, master planning, terrain analysis, trajectory analysis, transportation, and wireless telecommunications.

### UNITED STATES AIR FORCE GEOBASE DESKTOP TOOLKIT APPLICATION UPGRADE

(9/12/2007) The United States Air Force, Air Combat Command awarded Adasphere a contract to refactor and enhance the USAF GeoBase Desktop Toolkit. Aligned with the Department of Defense vision for worldwide data sharing, GeoBase provides a common operational picture for decision makers.

### EPA: SUPPORT FOR CLEAN AIR MARKETS AND RELATED ENVIRONMENTAL PROGRAMS

(8/16/2007) Adasphere will provide support for the Clean Air Markets Division and other related programs of the EPA. Adasphere will be involved with the development and re-engineering of information systems, databases, geographic information systems, and models. These systems are used for the analysis of particular regulations, policies, and issues that are pertinent to environmental quality.

### EPA TECHNICAL AND OUTREACH SUPPORT SERVICES

(7/30/2007) Under a consulting agreement, Adasphere will provide support services for domestic and global climate initiatives and global climate change programs. This includes the modification and enhancement of the Emissions Data Analysis Tool. The development of additional GIS mapping tools and analyses of the potential and actual impacts of sea-level rise using terrain models, wetlands data, and tidal data are among the customer's interests.

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### EPA AIR QUALITY ANALYST EXTENSION

The extension allows for the import, display, and analysis of Hybrid Single-Particle Lagrangian Trajectories (HYSPLIT). The technologies enable geo-spatial analysis of air

particle travel, concentration probabilities, and source-receptor analysis (i.e. what is the likely upstream source of pollution?)

## **EPA EMISSIONS INVENTORY SYSTEM (EIS)**

Adasphere staff participated in the re-engineering, architecture, and design of the EPA's Emissions Inventory System. Domain-driven design and agile programming techniques result in thorough documentation and excellent communication between managers, developers, end-users, and customers. Outputs include various diagrams that are easy-to-read from various perspectives. These techniques are also used in other projects.

## **ENTERPRISE GIS FOR MILITARY INSTALLATION MANAGEMENT**

Adasphere staff designed and implemented several enterprise, web-based geographic information systems used in the management of military installations. They provide the capability for users to draw features directly on a web-based map, perform geographic analysis, and link documents to geographic features. They also integrate facilities management systems, hazardous management systems, personnel databases, active directory information, and geo-referenced floor plans. Each component of the whole system is encapsulated into an application programming interface (API) and can be used in other applications, deployed to different platforms, and exposed via web services.

### **ADDITIONAL ADASPHERE PROJECTS INCLUDE:**

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... pioneering a Bayesian variation of multi-response permeation procedures (MRPP) to detect spatial correlations in the presence of confounding factors

... developing improved kriging procedures that combine the strengths of conventional kriging approaches and artificial neural networks (ANNs)

... experimenting with genetic programming as a new tool for explaining spatial patterns

... constructing a GIS/operations research model that can be used to predict optimal routes of new paths by estimating the location of occluded portions of paths in remotely sensed imagery

... and more

## **CONTACT US**

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