

Company and Project Portfolio

November, 2006
INOVA informatički inženjering, d.o.o.

 inova

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Company and Project Portfolio

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Basic company data

Company Name:	INOVA informatički inženjering, d.o.o.
Legal Name:	"INOVA informatički inženjering", d.o.o. Društvo sa ograničenom odgovornošću za projektovanje informacionih sistema, kompjuterski konsalting i usluge, export-import, d.o.o. Banja Luka
Country:	Bosnia and Herzegovina
Date Established:	March 29 th , 2003.
VAT Number:	400977670007
Registration Number:	1943227
Tax Registration:	02/01-0801/457-1235/3
Court Registration:	1-12035-00 Osnovni sud u Banja Luci
Customs Registration:	5413 / 04.07.2003. Ministarstvo finansija RS Republička uprava carina, Banja Luka

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Company ownership

INOVA informatički inženjering, d.o.o. is a privately-held corporation situated in the city of Banja Luka, Bosnia and Herzegovina. It's owned in total by its founder and president Mr. Ljubiša Savović. Mr. Savović is 41 years old and holds a M.Sc. degree in Communicology.

INOVA - Geoinformatika, d.o.o. is Inova informatički inženjering, d.o.o. outpost situated in neighboring Serbia and Montenegro's capital Belgrade. There are four part owners, including two investors from Inova Bosnia and Herzegovina and two present employees. The largest of these (55%), the president of Board of Directors, is Mr. Ljubiša Savović. There are three other owners, Board of Directors members who own 15% each, therefore taking active role in management decisions.



INOVA informatički inženjering, d.o.o. Banja Luka is also founder of **INOVA Volleyball Club**, a Bosnia-Herzegovinean volleyball sport club and youth association providing both financial and technical means to help young sport talents.

Short company history

Year 2000

Current founder and owner of Inova, Mr. Ljubiša Savović, won the first prize at Bruxelles' 50th International exhibition of innovations and new technologies for the original concept of IT support to spatial and infrastructure management contextually oriented towards faster development of transitional societies. During this year the same concept has been presented on International exhibition of new technologies held in Odessa – winning the first prize for the second time.

Year 2001

Conceptual solution was named AreaCAD-GIS and became foundation for starting privately-held enterprise Inova informatički inženjering d.o.o. with its headquarters in Banja Luka. In technological sense Inova chooses Autodesk ISD vertical as a basic platform for further development of spatial mapping and infrastructure design tools suitable for integration into existing business applications and relational database systems. These systems were already integrated into the ERP architecture of public enterprises being in charge of targeted infrastructure. Mr. Maksim Šestić was appointed to head of development and programming team.

Year 2002

Inova becomes registered Autodesk dealer. It's main goal is to gradually implement Autodesk platforms and initiate software legalization process in Bosnia and Herzegovina – a CEE region where digital processing was just in instantiation phase. It was clear from beginning that we couldn't expect high revenues in a 3rd World market devastated by recent war, a country with no strict intellectual property regulations and policies. Having that in mind, our initial strategy was based on progressive takeover of large corporations followed by continuous market education. For that reason we didn't insist on our prospects buying large number of software licenses.

Year 2003

Inova gained Autodesk authorized developer status. We focused our development and marketing philosophy towards telecommunications market. Later the same year first version of TeleCAD-GIS was released – our major software application for planning, design and management of telecommunications infrastructure systems.

Year 2004

The year of implementing TeleCAD-GIS at almost every outsourcing partner and engineering bureau of Telekom Srpska, national telecommunications services provider in Bosnia and Herzegovina. The same year Inova becomes a strategic partner of Telekom Srpska, continuing to spread its excellence in the field of CAD and GIS regionwide.

Year 2005

TeleCAD-GIS becomes primary tool for digital technical records processing and GIS data acquisition of two national telecom corporations (Telekom Srbija and Telekom RS). Based on that potential Inova signed Unique Application Reseller agreement with Autodesk. New development center was established in Belgrade – a company named Inova-Geoinformatika d.o.o. Its main tasks are: quality of service and long-term support to development of GIS in Telekom Srbija; distribution of TeleCAD-GIS application on the territory of Serbia and Montenegro; instrumentalization of huge Belgrade staffing potentials for rapid development of new software applications aimed at spatial and infrastructure systems based on Autodesk platforms.

Management and consultants

Management team

Mr. Ljubiša Savović

- Position:** Founder and Owner
- Education:** M.Sc. degree in Communicology
- Team Role:** Long-term envisioning of overall company development, regional implementation and business tactics. Suggests best short-term strategies and approaches to acting C.E.O., C.T.O. and C.F.O. during weekly (sometimes – daily) meetings.

Mr. Maksim Šestić

- Position:** C.E.O. and Development Division director
- Education:** B.Sc. degree in Theoretical Physics
- Team Role:** Transforming ideas to products. Keeping track of current technologies and listening to future ones, finding their place within corporate development cycle. Coordinates activities with the Owner and acting Divisions directors. Establishes direct communication with Team leaders when deadlines knock on the door.

Mr. Goran Medić

- Position:** C.T.O. and Services Division director
- Education:** B.Sc. degree in Telecommunications
- Team Role:** Driving Inova products and services strategies. Taking active role when it comes to integration of new technologies at regional Telcos and their subsidiaries. Also an expert in telecommunications standards and their implementation. Coordinates activities with acting C.E.O. and telecommunications Team leader.

Mrs. Radmila Cvetković

- Position:** C.F.O. and B.A. and Finances Division director.
- Education:** B.Sc. degree in Financial Accounting
- Team Role:** Keeping track and management of corporate records: HR, finances, administration and insurance. General financial accounting and good business rules and practices imple-

mentations. Contacts Owner and acting C.E.O. when it comes to projects realization or deadlines.

Mrs. Danijela Lakić

Position: Sales and Marketing Division director

Education: B.Sc. degree in Business Planning

Team Role: Attracting potential customers and keeping existing ones via proactive marketing campaigns, new sales services, informative newsletters and regional trade shows. Coordinates activities closely to Owner and acting C.E.O. and C.F.O. Provides financial and technical means and support to local and regional sales channels, both pre-sales and post-sales.

Mr. Dejan Raketić

Position: Development Team leader.

Education: B.Sc. degree in Telecommunications

Team Role: Directing coders and other developers towards envisioned software functionalities. Enforces coding best practices, software documenting and connectivity parameters while keeping developers feel happy. Recruiting new development and testing staff. Extensive communication with Development and Services Divisions.

Mrs. Nataša Simićević

Position: Telecommunications Team leader.

Education: B.Sc. degree in Telecommunications

Team Role: Manages telecommunications services and keeps tracks of current projects covering fixed and fiber-optical access networks, radio-relay and GSM transport. While in constant touch with urban planners and civil engineers suggests in-the-field experiences and first-hand solutions to Services Division.

Regular senior consultants

Mr. Miloš Mišković

Expertise: Mapping and Cartography

Education: University Professor, Ph.D. degree in Geography

Mr. Vladimir Lukić

Expertise: Geodesy and Civil Engineering

Education: University Professor, Ph.D. degree in Geodesy

Mr. Milenko Stanković

Expertise: Spatial Planning and Architecture

Education: University Professor, Ph.D. degree in Spatial Planning

Regular consultants

Mr. Aleksandar Trifković

Expertise: Environmental Assessment

Education: M.Sc. degree in Environmental Sciences

Mr. Siniša Vukićević

Expertise: Spatial and Urban Planning

Education: M.Sc. degree in Spatial Planning

Mr. Boris Marković

Expertise: Forestry

Education: M.Sc. degree in Forestry

Mr. Vladimir Petrović

Expertise: Photogrammetry

Education: B.Sc. degree in Remote Detection

Mr. Savo Maksimović

Expertise: Telecommunications

Education: B.Sc. degree in Telecommunications

Accreditations

We are committed long term to the mission of helping our customers realize their full potential. Just as we constantly update and improve our products, we want to continually evolve our company to be in the best position to accelerate new technologies as they emerge and to better serve our customers.

To achieve that goal, Inova accepts and deploys broad range of technologies – we collaboratively focus on planning, researching, and developing of innovative software solutions with an ecosystem made up of industry, academic, and government partners.

Our general development concept foster partnerships between academia, the industry, and Inova. Industry partnerships include infrastructure industry clusters, various quality certification programs, and support for selected research projects. During years of experience behind us we made strong and longlasting partnerships with world class players targeting fields of OS, RDBMS, CAD, GIS, AEC and OCR:

Autodesk:

- Authorized ISV Partner
- Authorized Unique Application Reseller
- Authorized Value Added Reseller
- Authorized Developer

Microsoft:

- Authorized Partner (including OSV)
- Authorized Reseller

Consistent Software:

- Authorized Reseller

CADLock:

- Authorized Distributor

ABBYY Software House:

- Authorized Reseller

Nemetschek:

- Authorized Distributor

Markets and segments

Utility and infrastructure

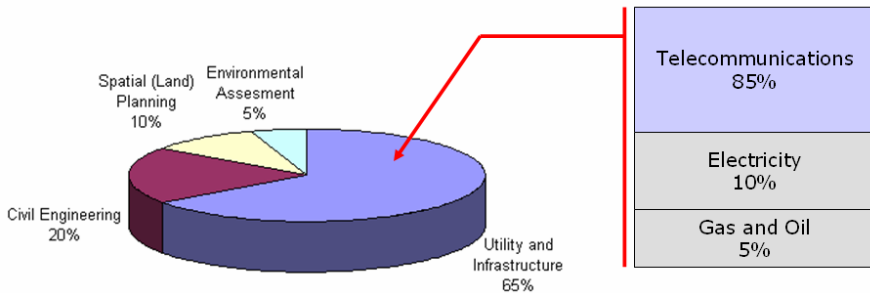
Inova encompasses a broad range of applications and services. Although definitions vary, we typically include applications geared toward GIS related data acquisition, infrastructure assets management, spatial networks management, service provisioning and customer care in general. Increasingly, these applications are becoming more interdependent so telecommunications carriers and other infrastructure enterprises are beginning to realize how important our world-class solutions are to effective competition.

Telecommunications Infrastructure: Development and implementation of custom and Autodesk-based solutions targeting complete regional Telcos corporate lifecycle: planning, design, implementation and management. Scalable solutions to fit the needs of both large Telcos and their offsite subcontractors. Established Standards and Interfacing procedures towards Cadastre and Spatial Planning. Solutions in telecommunications include, among other software tools, various implementations of Inova's flagship product TeleCAD-GIS.

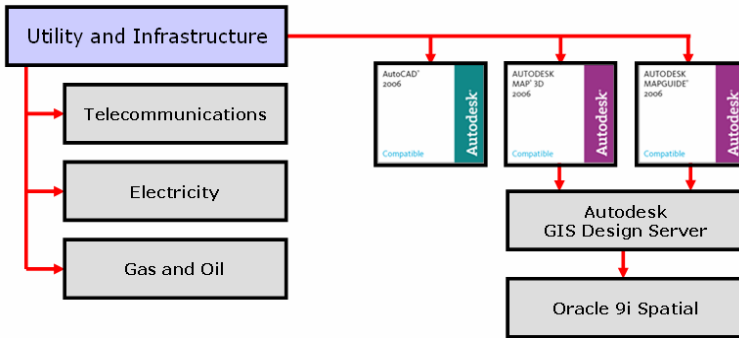
Electricity Infrastructure: Inova is entering electricity infrastructure market, having envisioned CAD and GIS related software implementations based on Autodesk platforms during second half of 2006. All projections are made having in mind huge marketing potential in Bosnia and Herzegovina, Serbia and Montenegro, Macedonia, Croatia and Slovenia.

Gas and Oil Infrastructure: Currently Project-specific.

Following graph represents Inova's utility and infrastructure market and total percentage of custom and Autodesk-based software solutions developed, localized and standardized for each specific market:



Utility and infrastructure market segments breakdown by integrated software platforms:



As the information superhighway cruises into the next century, telecommunications will be the sustaining vehicle for a progressive society. The ultimate goal of every telecommunications company that plans, engineers, constructs, and maintains outside plant facilities is to have a one-stop-shop for all of their facility data. This can be accomplished by building an enterprise-wide GIS containing a series of spatially enabled relational databases.

Inova has a wealth of knowledge and experience in the telecommunications arena. From data conversion to network modelling, we can build, implement, and manage corporate spatial data using proven technologies and custom developed software tools that facilitate standardized record keeping, timely access to data, improved network planning, and better management of constructions forces; all resulting in the overall goal – delighting the customer.

As previously elaborated, our primary target group are nationwide and regionwide telecommunications service providers and their outsourcing partners. Inova specializes in low-cost high-end solutions applicable in both developed and 3rd World and developing countries. Regional infrastructure and utility corporations have decades long tradition of using Autodesk CAD software applications, but due to lack of professional GIS solutions during last ten years, they generally, turned to competition like ESRI. On the other hand competitive solutions (e.g. ArcGIS-based) are strongly focused on GIS only, enabling us entering the CAD/GIS market with standardized, localized, modern Autodesk solutions based on strong enterprise architecture and services. Such approach gave extremely positive regionwide results.

Civil engineering

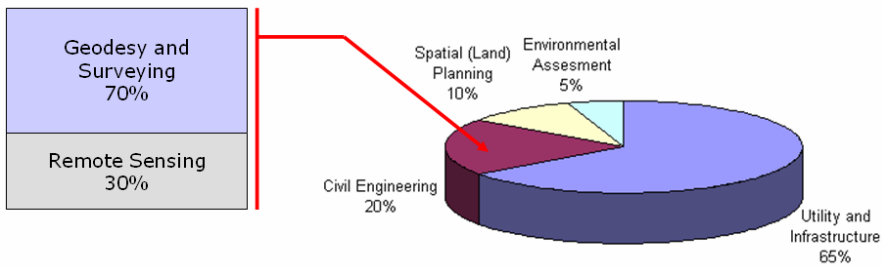
Surveyors and engineers understand the importance of geographic data. Surveyors use precise instruments, procedures, and computations to accurately locate and define geographic features while conducting field surveys that range from cadastral to engineering construction layout. Engineers design and build structures and infrastructures on geography measured by surveyors.

Autodesk-based software is the industry standard for creating, managing, analyzing, and displaying geographic information. It's also recognized by today's civil engineers as the intelligent choice for work in site development, hydraulics, hydrology, surveying, transportation, planning and public works, providing the rich set of database and spatial tools needed to manage civil information for design, modeling, and maintenance.

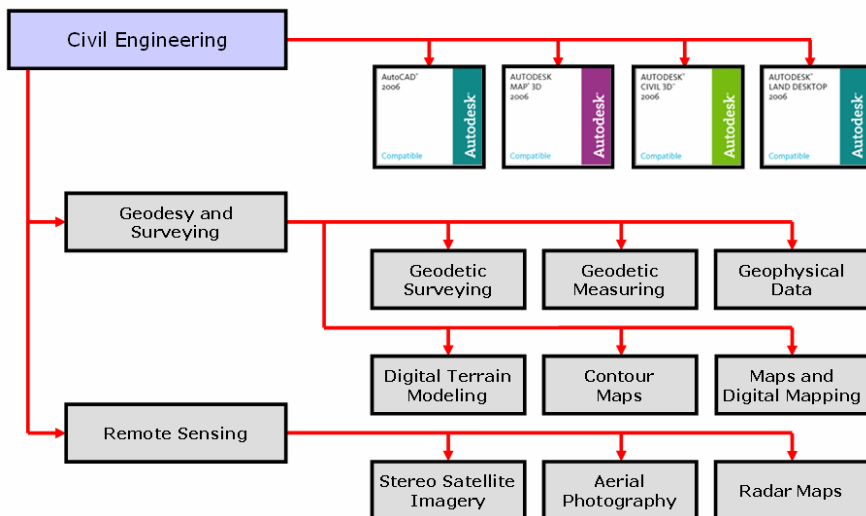
Geodesy and Surveying: Development and implementation of Autodesk-based solutions targeting national Surveying and Geodesy bodies: planning, design, implementation and management. Scalable solutions to fit the needs of both Surveying departments and their civil engineering offsite subcontractors (i.e. municipalities). Established Standards and Interfacing procedures towards Utilities/Infrastructure and Spatial Planning.

Remote Sensing: Currently Project-specific.

Following graph represents Inova's civil engineering market and total percentage of Autodesk-based software solutions developed, localized and standardized for specific market:



Civil engineering market segments breakdown by integrated software platforms:



Spatial and Land Planning

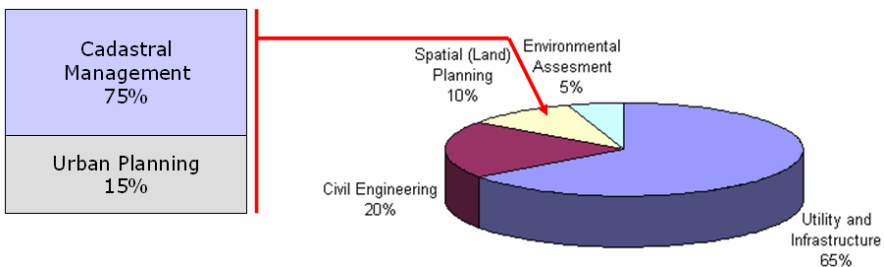
No matter how large or small the community, planners must deal with spatial information: parcel, zoning and land use data, addresses, transportation networks, and housing stock. Spatial planners also study and keep track of multiple urban and regional indicators, forecast future community needs, and plan accordingly to guarantee the quality of life for everyone in livable communities.

Cadastral Management: Development and implementation of custom and Autodesk-based solutions targeting national Cadastre lifecycle: data acquisition, implementation and management. Scalable solutions to fit the needs of both Cadastral departments and their civil engineering offsite subcontractors. Established Standards and Interfacing procedures towards Geodesy and Surveying, and Spatial Planning.

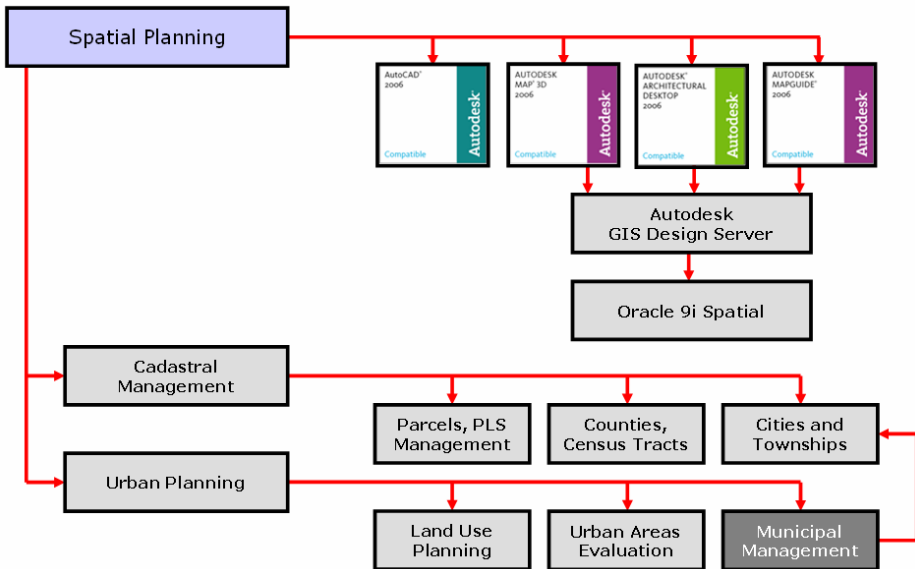
Accurate, cadastral maps define legal repositories of land ownership, value, and location, allowing individuals and businesses to raise capital based on property values. In turn, the capital can be used to purchase other property, start businesses, and pay for higher education, among other capital-intensive activities.

Urban Planning and Architecture: Development and implementation of Autodesk-based solutions targeting both national Spatial Planning bodies and Architectural organizations and buros: planning, design, implementation and management. Scalable solutions to fit the needs of both Spatial Planning departments and their civil engineering offsite subcontractors (i.e. municipalities and architectural buros). Established Standards and Interfacing procedures towards Utilities/Infrastructure and Civil Engineering.

Following graph represents Inova's spatial and land planning market and total percentage of custom and Autodesk-based software solutions developed, localized and standardized for specific market:



Spatial and land planning market segments breakdown by integrated software platforms:



Federal, regional, state, county, and local planning agencies have realized the power of enterprise GIS to identify problems, respond to them efficiently, and share the results with the public. Inova's solutions provide tools to help reach agency mission while doing more and spending less. GIS offers governments good return on investment by supporting department-specific applications from a shared enterprise database.

Environmental assesment

GIS software helps organizations, agencies, and governments work together to develop strategies for sustainable development. It provides the tools to access and process information from a variety of sources and display it in a spatial and visual medium. This supports decision making and promotes better organizational integration and knowledge management to improve the quality of life for future generations.

Our technology and services are driven by a desire to increase the knowledge of the earth's systems and processes to foster better decisions in accommodating growth and change. Specific services have been developed to provide planning services as well as address existing problems of environmental contamination. These services range from highly technical information solutions to regional landscape characterization including: Landscape Classification, Environmental Planning, Land Use Planning, Site Characterization and Remediation Data Integration.

Forestry Management: Development and implementation of custom and Autodesk-based solutions targeting national Department of Forestry lifecycle:

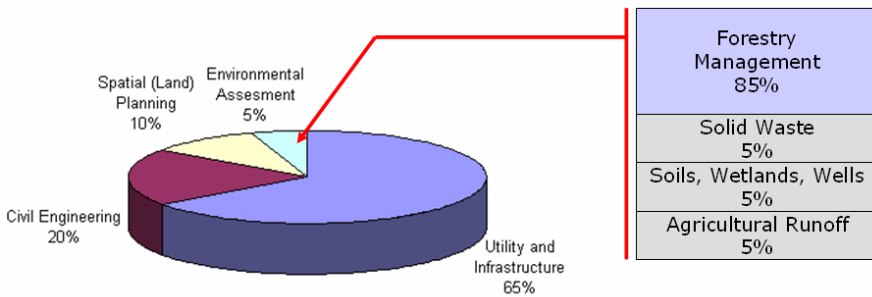
data acquisition, implementation and management. Scalable solutions to fit the needs of both DoF departments and their civil engineering offsite subcontractors. Established Standards and Interfacing procedures towards Geodesy and Surveying, and Spatial Planning.

Solid Waste Management: Currently Project-specific.

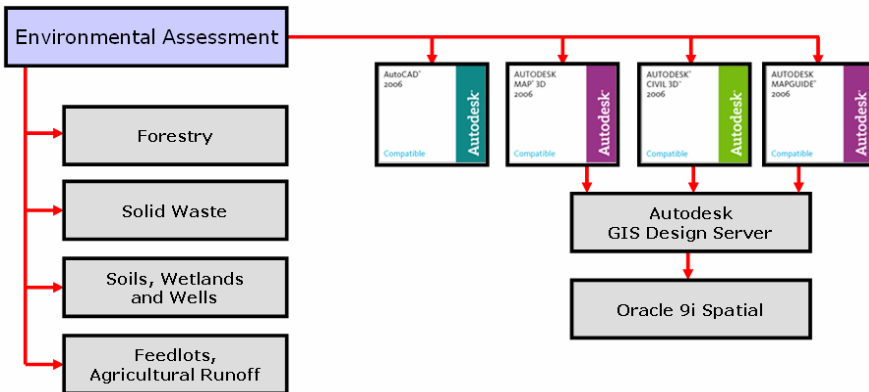
Soils, Wetlands and Wells Management: Currently Project-specific.

Feedlots and Agricultural Runoff Management: Currently Project-specific.

Following graph represents Inova's environmental assessment market and total percentage of custom and Autodesk-based software solutions developed, localized and standardized for specific market:



Environmental assesment market segments breakdown by integrated software platforms:



Most of plans and activities covering area of environmental assesment were directed by NEAP BiH (National Environmental Action Plan). A key element of the NEAP is the comprehensive analysis of the state of the environment, covering the key environmental issues (air, water, land, forests, waste, space, economy, biodiversity, demography, legal and institutional framework).

Projects and activities

Telecommunications

TS-TCG [455/05]

Assignment name:	Acquisition and integration of software applications for digital technical documenting and forming of a central GIS database of telecommunications systems	
Country:	Serbia and Montenegro	
Name of client:	Telekom Srbija, a.d.	
Contract number(s):	UG 25016/05, UG 2384/05	
Value of project:	320.000 EUR + Support	
Start date (M/Y):	03/2005	Completion date (M/Y): 10/2006

Project description: Company-wide implementation of Inova's TeleCAD-GIS software modules, an Autodesk-based client-tier application for OSS telecommunications infrastructure networks planning, design and documenting. Each software module provides customized tools for specific network topology design, dimensioning, analysis and simulation. In its initial revision software offered following modules:

- digital project management
- raster imagery georeferencing and calibration
- metropolitan and rural copper networks design
- metropolitan underground conduits and ducts subsystem
- metropolitan and regional optical networks and optical fibers

Digital project management: Modern business rules suggested that the sole use of CAD (Computer Aided Design) is not a major advantage in designing a project. It was necessary to integrate such projects into the overall company business cycle. Digital Project Management (DPM) module enabled: scheduling and tracking principle documents during the whole life-time of the project; common indexing, searching and browsing among hundreds of gigabytes of project documentation; using the inter-exchangeable formats and records; company-wide integration of proposed design rules and standards.

Raster imagery processing: Application module providing precise georeferencing, calibration and ortho-rectification tools for a wide range of scanned raster imagery and formats. Tools also utilize various raster imagery pre-processing functions, rubbersheeting and scaling, filtering, etc. Module enables database-

driven indexing, automatic enumeration and searching of processed imagery data: geodetic plans and maps, ortho-photogrammetric plans and topo-maps. Implemented solution enables hybrid use of raster and vector foundation for planning and design, speeding up the process of potential customer identification, precise routing and R.O.W. tracking, etc.

Copper networks design: covering both metropolitan and rural, numerous developed tools enable quick and reliable planning, design, dimensioning, analysis and simulation for several types of copper networks topologies. Network planning sub-system enables interactive forecast simulations, while thematic mapping tools help analyzing the surveyed data. Various PF accuracy methodologies were developed. Planning and design tools also include: computation of the gravity centers for optimization of significant network nodes locations, layout control functions, automation of element codification, dimensioning, implementation of engineering rules and standards. Contains rich and customizable libraries of copper cables and other copper network elements.

Conduits and Ducts networks design: module for planning and design of underground telecommunication concrete conduits system, duct-banks, trenches and other underground access structures. Includes tools for as-built manholes and surveyed shafts design, automatic duct sizing with regard to number and capacity of copper and optical cables, duct availability analyses, etc. Developed sub-systems for schematic design and manhole interior design and annotation (walls, pipes and cables placement, supporting equipment...) quickly and accurately document any aspect of underground conduits network topology. Comes with predefined, customizable library of pipes and manholes, including various sets of manhole equipment.

Fiber optical networks design: covering both national (backbone) and metropolitan fiber optical networks, developed tools enable detailed and reliable planning, design, dimensioning, analysis and simulation of single-mode and multi-mode fiber optical networks. Includes inside & outside plant design that matches real-world conditions; connectivity and tracing functions; automated schematics, cross-tabs and layout diagrams design. Enabled failure analysis of fiber optic cables, components and devices from manufacturing operations, important in reliability assurance for fiber optic communications networks.

Installation base: 150 TeleCAD-GIS licenses were distributed among client's directorates and regional operational units. More than 250 engineers and employees attended training and education sessions suited specifically towards CAD/GIS tools use and best practices. Directorates include: Information Technologies, Fixed Telephony, Mobile Telephony and Corporate Management. Regional units include: North, Belgrade, Center and South.

TRS-INVENTORY [168/05]

Assignment name:	Software tools and services for implementation and management of centralized GIS repository of OSS telecommunications objects and systems	
Country:	Bosnia and Herzegovina	
Name of client:	Telekomunikacije Republike Srpske, a.d.	
Contract number(s):	UG 333/05	
Value of project:	300.000 EUR + Support	
Start date (M/Y):	10/2005	Completion date (M/Y): 01/2007

Project description: Deployment and integration of Inova's flagship product TeleCAD-GIS Enterprise - a highly scalable and customizable enterprise solution for national and large regional telecommunications infrastructure cadastre planning, design, documenting, maintenance and corporate management. It was designed using Enterprise Information Architecture (EIA) standards, requirements and guidelines. Overall solution is based on business functions defined by OSS Enterprise Business Architecture and accompanying Business Model, extending across corporate boundaries. Implemented solutions provide support for all levels of OSS infrastructure planning, design and engineering across multiple technologies that include circuit-switched, wireless, optical, fixed access and data. In the area of network management, Inova developed sub-systems for capacity planning, network inventory, and traffic engineering analysis and methodologies to help identify network resources and manage all physical and logical aspects of network.

Subscriber management: implementation of an Autodesk MapGuide GIS Internet browser in management and commercial offices, to give graphical access to subscriber locations, as well as significant OSP elements locations and identifications; Interface with Line Configuration System, to be able to transmit the job order and service activation data.

Network maintenance: current GIS and database now have standardized file transfer formats: interoperability is a question of clarifying the data format in details (graphical and alphanumeric); by implementing a standard Internet browser in operation centers, users have an easy access to current plans and data. Existing interfacing OSS and OSP maintenance tools is were improved; "Network Plant Record" Departments are now centralized, having a single authorized data updating center (GIS DataStore).

GIS technology enabled telecommunication professionals to integrate location-based data into analysis and management processes in network planning and operations, marketing and sales, customer care, data management, and many

other planning and problem-solving tasks. A GIS integrated location-based data from databases all over the corporation to help its staff resolve and streamline everyday business tasks.

Deployed platforms: TeleCAD-GIS engine provides the sophisticated functions needed to cover all the graphical constraints - implementing a data model and the rules dedicated to Telecom Operators, while underlying Autodesk Map OEM adds the complementary elementary functions to cover the DWG and mapping issues, as well as the major graphical format conversions. Autodesk MapGuide solution allowed a low cost and scalable Intranet/Internet access to the graphical and alphanumeric data, using the Microsoft's Internet Explorer as a client. The Autodesk GIS Design Server 8 and Oracle 9i Spatial server were implemented as a centralized GIS repository of network elements and services (RDBMS). Oracle Spatial Cartridge improves the management efficiency for a wide number of spatial objects and attributes.

Installation base: 50 TeleCAD-GIS OEM licenses were distributed among client's directorates and regional operational units. 1 TeleCAD-GIS Enterprise server and centralized GIS repository. More than 50 engineers and employees attended training and education sessions suited specifically towards CAD/GIS tools use and best practices. Directorates include: Information Technologies, Fixed Telephony, Mobile Telephony and Corporate Management. Corporate and regional units include: TT Banja Luka, TC Gradiška, TC Prnjavor, TC Srbac, TC Kotor Varoš, TT Bijeljina, TC Ugljevik, TC Lopare, TC Janja, TT S. Sarajevo, TC Pale, TC Lukavica, TC Han Pijesak, RT Mrkonjić Grad, TC Šipovo, RT Prijedor, TC Novi Grad, TC Kozarska Dubica, TC Kostajnica, RT Doboj, TC Teslić, TC Modriča, TC Brod, TC Derventa, RT Brčko, TC Šamac, TC Pelagićevo, RT Zvornik, TC Vlasenica, TC Šekovići, TC Osmaci, RT Srbinje, TC Višegrad, TC Rogatica, RT Trebinje, TC Bileća, TC Nevesinje, TC Ljubinje, TC Gacko and TEOL.

TRS-INVEST [89/05,331/06]

Assignment name:	Software application for planning, tracking and management of both medium-sized and capital investments in telecommunications infrastructure	
Country:	Bosnia and Herzegovina	
Name of client:	Telekomunikacije Republike Srpske, a.d.	
Contract number(s):	UG 123/04, UG 148/06, UG 233/06	
Value of project:	162.000 EUR + Support	
Start date (M/Y):	05/2004	Completion date (M/Y): 05/2006

Project description: Enterprise-wide deployment and integration of ERP application INVEST for planning, instant tracking and corporate management of investments in telecommunications infrastructure. In general – it's an Oracle web-based investment record planning, keeping, performance measurement and portfolio management acquisition and reporting tool designed for departments entrusted with managing investment assets. Certain application aspects were tightly integrated with TeleCAD-GIS Enterprise. It allows a corporation to maintain complete records of all portfolio transactions, stocks and goods, periodically value portfolios, track contracts records, bids and investment cost bases, plan and compute return on investment (ROI) performance, and generate comprehensive reports and graphs.

Overall investment tracking: Application allows establishing investment Master plan, yearly plans, execution plans, and more. It integrates investment data, up-to-date financial data, real-time stock and equipment data, as well as on-site execution data - providing unique tools for preparation of corporate tender bids, contracts, financial portfolios, etc.

Site and Execution tracking: Detailed building site plan acquired using TeleCAD-GIS client tool is being imported into investment tracking application. It allows real-time tracking of deployment execution details and its overall percentage – exact quantities, type and geographical location of equipment being installed on site. Application automatically compares contracted and executed values, as well as current state of equipment on stock, issuing a warning if one of them doesn't match.

Stock and Equipment tracking: During investment preparation and execution phase application monitors and keeps track of each stock status, issuing a note to stock manager if ordering of necessary equipment is needed. It also ensures that contracted items is the equipment being installed on-site, within provided contracted terms and propositions.

Finances and Transactions: Enterprise-wide financial planning and tracking of investments and transactions. While being integrated with corporate financial management software, each executed portion of investment is being transferred to predefined accounting department. It enables on-time projections of profit and loss regarding any targeted investment, including Expenses Management, as well as overall impact of corporate investments Master plan execution.

Deployed platforms: Oracle schemas and applications targeting Oracle 9i/10g Server and Clients. TeleCAD-GIS drafting engine provides necessary functions needed to cover on-site investment execution - implementing a data model and the rules dedicated to Telecom Operators. Autodesk MapGuide solution allows a low cost and scalable Intranet/Internet access to the graphical and alphanumeric data. Microsoft's Internet Explorer acts as a thin client. Existing Autodesk GIS Design Server 8 and Oracle Spatial server (acting as a centralized GIS repository of network elements and services), were optimized and customized according to project needs.

Installation base: 96 Inova INVEST licenses were distributed among client's directorates and regional operational units. Provided integration with TeleCAD-GIS Enterprise server and centralized GIS repository. Directorates include: Information Technologies, Fixed Telephony, Mobile Telephony and Corporate Management. Corporate and regional units include: TT Banja Luka, TC Gradiška, TC Prnjavor, TC Srbac, TC Kotor Varoš, TT Bijeljina, TC Ugljevik, TC Lopare, TC Janja, TT S. Sarajevo, TC Pale, TC Lukavica, TC Han Pijesak, RT Mrkonjić Grad, TC Šipovo, RT Prijedor, TC Novi Grad, TC Kozarska Dubica, TC Kostajnica, RT Doboj, TC Teslić, TC Modriča, TC Brod, TC Derвента, RT Brčko, TC Šamac, TC Pelagićevo, RT Zvornik, TC Vlasenica, TC Šekovići, TC Osmaci, RT Srbinje, TC Višegrad, TC Rogatica, RT Trebinje, TC Bileća, TC Nevesinje, TC Ljubinje, TC Gacko and TEOL.

TRS-NETWORKS [142/05]

Assignment name:	Planning and design of telecommunications access networks (OSP) using TeleCAD-GIS software tools.	
Country:	Bosnia and Herzegovina	
Name of client:	Telekomunikacije Republike Srpske, a.d.	
Contract number(s):	UG 16/05	
Value of project:	150.000 EUR	
Start date (M/Y):	01/2005	Completion date (M/Y): 04/2006

Project description: Planning and general project design of OSP (OutSide Plant) copper and fiber-optic telecommunications access networks, including accompanying switching and conduit/duct systems covering following areas within Bosnia and Herzegovina:

- ATC Donji Garevci (Novi Orlovci settlement)
- ATC Bišćani, Rizvanovići, Rakovčani and Kalajevo
- MZ Vrbanja
- MZ Barlovci
- Starčevica (Banja Luka)
- Petrićevac (Banja Luka)
- Čelinac
- Kotor Varoš, KP-5
- Derventski Lug
- Osinja
- Stankovići and SPOK Osinja – Stankovići
- Kolibe Gornje and Zborište
- Drinić
- Srpski Kupres
- Obodnik and SPOK Kotor Varoš – Obodnik
- Konjuhovci and RSS Maćino Brdo
- Donja Ilova, Šibovska
- Prnjavor, KP-6
- Marići

OSP planning objectives: optimizing the infrastructures (civil works, aerial routes) and the network layout (cabinets, cables, joints, etc.) in order to provide the forecasted services to the potential subscribers at minimum cost. Adapt the switching, transmission or radio planning results to the field constraints. The additional mandatory objective was to utilize a set of methods and software tools (TeleCAD-GIS specifically) that optimise access networks in order to

provide and offer the QoS demanded by the end user jointly with the protection/survivability level specified at the telecommunications operator company (contractor), using wired and wireless access technologies with several topologies. During the design process, Inova experts were utilizing following methods and software tools:

Existing documentation conversion: scanning, rasterizing and vectorizing existing maps using dedicated TeleCAD-GIS raster and mapping editing tools was mandatory to get legible results. Developed Digital Terrain Models (DTM) and Building Elevation Models (BEM) were used for planning control.

Optimizing documentation quality: geographical continuum is achieved by usage of a consistent GIS coordinate system. GPS survey of the main street axis gave a good frame to adjust local documentation. TeleCAD-GIS topological functions allowed to enhance topo map quality. Satellite image resolutions are forecasted with a submeter accuracy in year 2004.

Demand forecast: interactive forecast simulations were needed to optimize the best Penetration Factor (PF) table. Thematic mapping possibilities helped analyzing the surveyed data using developed TeleCAD-GIS tools. Basic, large-scale PF tables were initially supplied by the contractor. Following methodologies were used to achieve higher PF accuracy: Macro Demand Forecast, Micro Demand Forecast, Extrapolations of significant areas, investigation statistics, and others.

Network design: computation of the "gravity" centers, per year/service, in order to optimize significant network nodes locations (exchanges, cabinets, etc.) using TeleCAD-GIS planning module; Also - assuring that network layout is consistent with infrastructure data; Applying cable layout control functions, to automate element codification and checking engineering guidelines (Infrastructure layout, Cable layout, Distribution Points design). Detailed network design was based on demand forecast results. Efficient OSP network design reduced infrastructure costs with respects of the technical constraints and local usage, giving enough flexibility to allow network extensions and to be adaptable to population micro-movements.

Records and Management: OSP records, including implementation drawings, schematic plans and bills of quantities and materials (BOQ, BOM) were produced using TeleCAD-GIS reporting tools. Application's flexible architecture allowed telecom operator to import complete production material diarectly into their ERP/TIS system for further exploitation and maintenance purposes, being able to improve and speed up future network extension design - which is mandatory to maintain the existing OSP data up-to-date.

TRS-GISWEB [174/04]

Assignment name:	Webcentric GIS application platform for telecommunications infrastructure systems	
Country:	Bosnia and Herzegovina	
Name of client:	Telekomunikacije Republike Srpske, a.d.	
Contract number(s):	UG 1-01-1085-1/04	
Value of project:	15.000 EUR	
Start date (M/Y):	12/2004	Completion date (M/Y): 05/2005

Project description: Implemented webcentric GIS technology enabled our client corporate-wide authoring and publishing maps and design information quickly and easily for distribution internally or on the web. Application targets telecom provider's technical departments productivity improvement and reduction of the costs of integrating and distributing maps and designs. It also serves as a bridge between centralized corporate GIS repository (TeleCAD-GIS Enterprise), engineering acquisition tools (TeleCAD-GIS) and various types of thin clients – to display acquired telecommunications infrastructure, coverages and services in real-time.

Solution's main features: Extends the reach and value of client's spatial information. Integrates design and spatial data from a variety of sources and servers, enabling development of new applications, and dissemination of maps and spatial data quickly and easily. Using industry-standard development tools, creates and shares spatial information as dynamic web pages or sends it to the field as self-contained, portable DWF files. Linux and Microsoft Windows platform support, support for Oracle and SQL Server, and integration of Open Geospatial Consortium standards assures a faster, easier, and more flexible way for telecom provider to integrate, analyze, and distribute crucial spatial information.

Deployed platforms: Oracle schemas and applications targeting Oracle 9i/10g Server and Clients. TeleCAD-GIS drafting engine provides necessary functions needed to cover data acquisition - implementing a data model and the rules dedicated to Telecom Operators. Autodesk MapGuide solution allows a low cost and scalable Intranet/Internet access to the graphical and alphanumeric data. Microsoft's Internet Explorer acts as a thin client. TeleCAD-GIS Enterprise, Autodesk GIS Design Server 8 and Oracle Spatial server (acting as a centralized GIS repository of network elements and services) were optimized and customized according to project needs.

Spatial and urban planning

ISOURBAN

Assignment name:	Information system for sustainable development of urban areas	
Country:	Bosnia and Herzegovina	
Name of client:	National Environmental Action Plan (NEAP) BiH Ministry of Spatial and Urban planning, RS	
Value of project:	est. 50.000 EUR	
Start date (M/Y):	06/2002	Completion date (M/Y): est. 2010

Project abstract: Majority of the human activities are focused in urban areas and that fact often result in degradation of environment and depletion of natural resources in it. In post-war period in B&H improper management of natural resources, especially in urban areas, threaten to impend long-term negative effects on the quality of water, land and air. In order to represent all these problems and spatial conflicts, assemble all necessary data at one place and provide better and more efficient environmental management, it is necessary to develop reliable information system. Such system should enable management and planning of human activities, data base formation and maintenance, and promotion of up-to-data techniques for environmental impact assessment and management.

Banja Luka is the capital of Republic of Srpska and main economy center. Importance of the town and broader area demand well prepared Management Plan for city's spatial, infrastructure, transportation and other systems. Due to the lack of geo-coded information base and appropriate digital cadastre it can be assumed that accurate situation of the state of environment is not known and that precise record of polluters (or possible polluters) does not exist. Moreover, simulation of alternative development scenarios and impact assessment (during the decision making and city planning process) is hardly feasible at all. Looking at the current situation, it can be concluded that formation of information base is necessary prerequisite for sustainable planning and development of urban area and adoption of modern European trends in environmental protection sector.

Additional info: <http://www.neapbih.ba>
Mr. Dragan Milojević
Co-Director, Republic of Srpska
NEAP BiH Directorate

Environmental assesment

ECO-ATLAS

Assignment name:	Digital environmental geo-spatial database for sustainable development of Bosnia and Herzegovina	
Country:	Bosnia and Herzegovina	
Name of client:	Regional Environmental Center (REC) BiH Environmental Protection Agency of BiH	
Value of project:	est. 70.000 EUR	
Start date (M/Y):	05/2002	Completion date (M/Y): est. 2010

Project abstract: Modern environmental management rely on advanced decision support systems that are based on large amount of data acquisition and processing, multi-objective optimization for determination of management decisions and simulation of various development scenarios prior to planning and design. In developed world, many attempts to accurately represent spatial and temporal distribution of the physical chemical and biological processes occurring within the nature, have resulted in complex and sophisticated Information tools with very specific data requirements. Recognizing the need for introduction of Spatial Information Systems in Environmental Management in transitional and developing countries many attempts to apply the same systems have been made. Unfortunately these attempts did not provide satisfactory results and most of these countries are wondering from one to another solution still without the clear vision and defined methodology accommodated to their needs.

At this moment it is not possible to identify serious and coexistent elements of modern (digital) integral geo-spatial systems in Bosnia and Herzegovina. Public Geodesy Surveying Agencies of both entities are still very far from building up an accurate and up-to-date digital Cadastre (Spatial Information System). Currently, it is impossible to technologically and contextually integrate current CAD and GIS mapping performed by many different infrastructure organizations, spatial and town planers and management structures, even at the level of basic thematic processing. In many cases production technology of such graphical databases doesn't provide basic possibility to cross-reference existing alphanumeric records and data being processed throughout the country. Digital outputs coming out from donated eco-projects in most cases exist only for the time being and within such projects. Global GIS projects (i.e. Digital Atlas of Bosnia and Herzegovina - scale 1:300.000) are too inaccurate by their scale and too deprived by their content in a way to become usable geo-spatial base for complex environmental and development projects - both on national,

regional and local levels. Direct result coming out of this project is production of geo-referenced digital thematic maps and plans that would represent:

- Informational basis for ECO-projects and studies on inter-municipal and regional levels;
- Information backup for decision-making processes on spatial allocation of point and dispersed sources of pollution and specific objects of eco-treatment;
- Focal and overall starting point for synthesized processing on the national level, in a way to produce analyses and reports required by internationally accepted eco-conventions and standards.

Indirect project goals:

- To initiate more serious access to development of compatible spatial information systems in Bosnia and Herzegovina, comparable to Central European ones;
- To provide information basis for increasing the number of investments into inter-entity and border projects targeting eco-prevention and sustainable development in general;
- To make a positive stimuli to and correctly influence development of tools, human capacity and common standards of geo-spatial processing in Bosnia in Herzegovina via consortia partnering;
- To valorise and put into function extensive research database covering fields of geomorphology, pedology, hydrography, etc. in Bosnia and Herzegovina.

This project was planned in a way that every activity represents standalone unit, resulting in specific commercial and social impact. Even by the first activity milestone there is a certain number of regionally important sub-projects: design and acceptance of concept of integral spatial information system (IPIS); introduction of digital data processing standards; creating a cadastre of domestic human and technological capacities and development of organizational management in that specific area. That's why collection, validation, systematization and processing of existing scientific material, just as well as engaging and organizing of existing capacities represents a key issue in sustainable development of Bosnia and Herzegovina.

Additional info: <http://www.rec.org>
Mr. Nešad Šeremet
Director, Bosnia and Herzegovina
REC BiH Implementing Agency

DANUBIUS [UNDP/GEF]

Assignment name:	Strategic plan for the development of the Danube river basin GIS	
Country:	Bosnia and Herzegovina	
Partnering to:	International Commission for the Protection of the Danube River (ICPDR), Cartography and GIS Expert Subgroup	
Start date (M/Y):	08/2000	Completion date (M/Y): est. 2027

Project abstract: The Strategic Plan for the Danube River Basin Geographic Information System has been prepared by the ICPDR Cartography and GIS Expert Subgroup (GIS ESG). The Strategic Plan serves both in the planning development process and in the implementation process. It provides long-term vision and long-range objectives, sets priorities and strategies in the development of a common DRB Geographic Information System (GIS), discusses coordination mechanisms and the use of the DRB GIS by the ICPDR and the 13 countries lying within Danube River Basin (DRB).

The Strategic Plan for a DRB GIS provides a formal method for communicating future growth and plans. It serves as a basis for decision-making and giving policy makers, management and users opportunity to become involved in the planning process, as well as to discuss and integrate their needs in accessing, examining, analyzing and generating visual representations (maps) of the geographically referenced information (geo-information) in order to meet Water Framework Directive reporting requirements and supports activities leading towards the aims of the ICPDR.

The development of a common, consistent and harmonised DRB GIS was begun to help provide a solution for the coordination between DRB countries and integration of existing and future data, providing a vehicle for DRB countries and ICPDR to get accurate information from its source in a timely fashion (DANUBIUS project). This Strategic Plan for DRB GIS addresses the organizational, technical and financial situation in the DRB countries, defines a planning procedure, identifies possible funding alternatives and explains strategies and concepts for the establishment of a common DRB GIS. It is based on the DRB GIS Needs Assessment carried out by the UNDP/GEF Danube Regional Project.

Additional info: <http://www.icpdr.org>
Mr. Höbart Alexander, IM and GIS
ICPDR Permanent Secretariat

Institutional capacity building

ECO-EDUCATION

Assignment name:	Education of the Public Administration in the area of geo-information systems toward sustainable development of Bosnia and Herzegovina	
Country:	Bosnia and Herzegovina	
Name of client:	National Environmental Action Plan (NEAP) BiH Ministry of Spatial and Urban planning, RS	
Value of project:	est. 50.000 EUR	
Start date (M/Y):	05/2002	Completion date (M/Y): est. 2008

Project abstract: Bosnia and Herzegovina pertain to countries that tend to adopt modern tendencies in environment protection sector and join EU as soon as possible. Almost every day Bosnia and Herzegovina sign new international conventions and accommodate its legislation toward EU ones. Looking from this perspective, institutional strengthening is a key issue in the sustainable development of Bosnia and Herzegovina and first prerequisite for integration of B&H into the EU.

One of the most important activities in the process of institutional strengthening is the education of employees in the area of use of modern informatics tools for decision support and management of natural resources. Current situation of education of employees in governmental and public services in use of modern informatics tools is very poor. Particularly hard situation is in the work of public and authority agencies that are dealing with large number of spatially distributed information. They are forced to bring decisions relying on manually processed data and with no possibility to assess impacts of alternative development scenarios.

This kind of situation represent an obstacle in further development and integration of Bosnia and Herzegovina with EU and threaten to produce long-term negative effects on the state of environment. One of the main causes for this situation is lack of systematic, clear and effective program for the education of employees in public and governmental institutions.

Additional info: <http://www.neapbih.ba>
Mr. Dragan Miložić
Co-Director, Republic of Srpska
NEAP BiH Directorate

Assignment name:	Local institutional capacity development in environmental sensitive areas	
Country:	Bosnia and Herzegovina	
Partnering to:	EU LIFE Bosnia and Herzegovina Urbanistički zavod Republike Srpske, a.d.	
Start date (M/Y):	01/2002	Completion date (M/Y): 12/2004

Project abstract: Uncontrolled urbanisation and development under the pressure of mass immigration and poverty pose a significant threat to the numerous important ecosystems (wetlands) as well as to human health and seriously undermine the possibilities for sustainable development in the republic. The environment protection system (which collapsed during the war) is currently at it's infancy, re-develop with E.U. commission's support, through a number of interrelated projects.

The Bardača wetland is one of the most important ecosystems in the area, an important stopover for migratory birds as well as an important economic asset for RS. It is under considerable pressure and soon anthropogenic impact may be irreversible. However there is still good chance that the wetland area can be preserved and the area around it can be economically developed in a sustainable way. This calls for immediate action, local scale stakeholders' cooperation and conflict resolution. The project (although autonomous) can be considered an extension to other projects dealing with the regional environmental planning sector, in the sense that it is dealing with the same planning and implementation issues on a smaller scale (local) and builds the capacity needed for EMS and EIA

Major project goals were aimed towards helping establishing institutional framework, legislation development and staff training within the scope of environmental protection in Republic of Srpska. There has been an expert education among the local government representatives, spatial planners and other professionals dealing with urban systems management, altogether with defining the future strategy of development of Republic Srpska and various applications of modern IT aiming rehabilitation, planning and management of environmental systems.

Additional info: <http://www.iu-rs.com>
Mr. Dalibor Bjelica
Head Manager
The Institute for Urbanism of Republic Srpska, j.s.c.

Clients base

Corporate users

Presented clients portfolio reflects our diverse capabilities and areas of expertise. We specialize in complex, challenging projects, regardless of size or amount, and we are continually expanding our in-house resources to address new challenges and opportunities.

Major account users have found Inova to be responsive to their needs for accountability and fairness, while bringing in complex projects in a cost-effective and timely manner. We have the staff, systems and history to deliver the planning, design management, cost and schedule control, quality assurance, reporting methods and record-keeping that ensure thoroughly documented and carefully controlled CAD/GIS projects.

Bosnia and Herzegovina:

- Telekomunikacije Republike Srpske, a.d.
- BH Telecom, d.d.
- Urbanistički zavod Republike Srpske, a.d.
- Direkcija za puteve Republike Srpske
- Federalna Regulatorna agencija za električnu energiju
- Elektroprenos Bosne i Hercegovine
- Tvornica cementa Kakanj, d.d.
- Fabrika glinice Birač
- Mittal Steel Zenica
- Zavod za izgradnju grada Banja Luka

Serbia and Montenegro:

- Telekom Srbija, a.d.
- Telefonija, a.d.
- TeleGroup, Ltd.

Design and planning buros

Even small and medium sized planning and design buros and departments can benefit from our software solutions. Having in mind general lifecycle of any infrastructural project, Inova offers extremely scalable and portable solutions to satisfy needs of outsourcing – since many enterprise systems tend to cut their in-house costs by subcontracting local design buros.

Utilized technology is practically the same, except it's downscaled to LANs and single PCs. Functionality keeps intact, since our client solutions use portable object model to optimize the plan, build, and operate project lifecycle for physical infrastructure assets.

Bosnia and Herzegovina:

- Telefonija Brčko, d.o.o.
- TeleGroup, d.o.o.
- K-Inel, d.o.o.
- Telkomprojekt, d.o.o.
- Hidrokop, d.o.o.
- Geoprojekt, d.o.o.
- Terc-Trade, d.o.o.
- Koming-Pro, d.o.o.
- TT Inženjering, d.o.o.
- Eling inženjering, d.o.o.
- Telrad, d.o.o.
- MKM Communications, d.o.o.
- Stillng, d.o.o.
- Patrija, d.o.o.
- Planing, d.o.o.
- Inkoprom, d.o.o.
- Skupština opštine Derventa
- IBG, d.o.o.

Serbia and Montenegro:

- Integra-Tel, d.o.o.
- Terra Engineering, d.o.o.
- GrimTel, d.o.o.

Products and solutions

Enterprise Architecture solutions

Today, the "build and deploy" world of IT is slowly disappearing as corporations seek to leverage technology as a strategic asset. Inova drives IT departments towards understanding how their IT projects are transitioning into broader enterprise initiatives that drive the organizational success. Implemented enterprise architecture solutions have a direct impact on an corporate agility in meeting regulatory challenges and adapting to changing environments. Enterprise architecture helps users incorporate their best practices and experiences into decisions about technology investments, compliance and emerging technologies, such as business process management (BPM) and service-oriented architectures (SOAs). In essence, enterprise architecture becomes a strategic foundation for knowledgeable decision making and is based on traceable facts in corporate repositories.

EA's value in decision support

Corporations are increasingly recognizing the value of enterprise architecture as more than a tool for information capture. Information that is captured in a repository but not disseminated in a meaningful way to the key stakeholder groups is not taking advantage of enterprise architecture as a strategic asset. The evolution of architecture is a result of the changing IT environment. Projects are evolving from single-technology solutions into broader enterprise initiatives and must be directly tied to business goals. The distribution of valuable information to internal groups so they can take action is critical to the success of an enterprise architecture program. As mentioned, architecture information can be useful in decision areas such as technology investments, portfolio management, compliance and other areas that promote the alignment of corporate IT and business. There are six areas where implemented enterprise architecture adds significant value:

- IT Architecture
- Financial Controls
- Portfolio Management
- Communication
- Configuration/Process Transfer
- Regulatory Compliance

Standardization general guidelines

There is a great need worldwide for a framework, or foundation, of easily and economically shareable information concerning the land, water, air, and man-made facilities. This kind of information is commonly called geographic information, which means that the information can be linked to specific geographic locations by such geographic locators as an address, a parcel ownership number, a mile marker, etc. It is widely acknowledged that 85% to 90% of all information collected and used by government agencies and utilities is geographically related. The use of guidelines and standards will make the collection, sharing and use of a geographic information framework more efficient and less expensive.

The geographic data framework Inova uses is consistent, standardized set of digital geospatial data and supporting services that will:

- provide a geospatial foundation to which an organization can add detail and attach attribute information
- provide a base on which an organization can accurately register and compile other themes of data, such as zoning, permits, assessment data, accident data, hazardous waste site data, etc.
- orient and link the results of an application to the landscape.

Inova geographic data framework should help data producers locate their information in its correct position and provide a means of integrating this information with other geospatial data. Benefits from the development of a statewide geographic data framework include reduced expenditures for data, increased ease of obtaining and using data collected by others, accelerated development of critical applications, increased number of customers for data products linked to the framework, and improved recognition of programs.

One of the most important tasks in developing a geographic data framework for Inova is to develop data standards for the various data themes that are most commonly needed and shared by both developers and customers. When data standards are clearly defined, useful data can and will be developed and shared by multiple data producers and users all across the community.

The guidelines presented here are intended to guide the creation of standards for geographic data, or geo-data as they will be referred to throughout the remainder of this short overview, and establish a vision for a worldwide geo-data framework that closely parallels framework development throughout the rest of the GIS community. As a result of this, Inova developed the following guidelines to guide our future activities:

To shape the growth of GIS through open communication, education, and cooperation in order to:

- Optimize data accuracy, reliability, and accessibility
- Meet the needs of the technical and non-technical user community
- Support the decision-making process

The objectives to be achieved as a result of that vision were identified as follows:

- Create an attitude of cooperation
- Generate something that will build support at home
- Identify common interests
- Identify processes for developing and maintaining standards
- Identify areas of need for standardization
- Identify obstacles and barriers to data sharing
- Avoid duplication in creating data
- Establish standardized metadata
- Ensure data security
- Create flexible standards
- Establish guidelines by which standards may be developed
- Catalogue existing data
- Build a larger community of technical and non-technical users
- Develop a geographic data framework for Eastern European countries/regions that is compatible with the concept of the European Geospatial Data Framework

Autodesk-based solutions

Autodesk first revolutionized the software industry with the AutoCAD product, which introduced drafting on a PC. The widespread popularity of AutoCAD software forged our company's lifetime commitment to practical innovation that drives productivity and profitability. AutoCAD also paved the way for Autodesk technology leadership in industries such as:

- building
- infrastructure
- manufacturing
- media and entertainment
- wireless data.

Today, Autodesk is a fully diversified software company that provides targeted solutions for creating, managing, and sharing digital assets. Autodesk's community numbers more than six million users and includes four global strategic partners – Microsoft, Intel, Hewlett-Packard, and IBM, as well as 2,500

third-party developers. Moving into the future, Autodesk continues to evolve strategic competencies to support customers' sustainability and success.

Inova, being a strong supporter of Autodesk's depicted development path, remain dedicated to helping integrate today's best technologies – such as advanced modeling, digital collaboration, and practical data management – into everyday business practices. In this way, we help ensure our customers' visions come to fruition and that our customers can compete in business and win.

Autodesk strategic competencies are reflected every our solution, which deliver on our vision of productivity and profitability in numerous industries. These competencies include:

Design & Drafting: More than two decades ago Autodesk introduced AutoCAD software, the design platform that improves productivity with powerful and quick drafting processes. Continuously innovated, the latest AutoCAD releases add greater intelligence into the platform and a more intuitive interface, which means fewer repetitive tasks and more time available for the creative parts of the design process.

Visualization: True-to-life, walkthrough visualizations provide outstanding previews of the ideas our customers want to sell and make real. Visualization can be used for selling designs to clients, visually demonstrating how a machine can produce a product, or discussing details of a future building site. Previsualization processes include the conceptual renditions of film, television, education, or game content, which can be implemented through animation of primary footage or special effects.

Advanced Modeling: An advanced approach to modeling enables architects, designers, and engineers to work the way they think and innovate more freely. Ideas are built virtually into a model, and the model's inherent intelligence causes any changes to automatically ripple through all dependencies. This results in substantive reductions in errors and rework, as well as providing an accurate sense of the viability of the modeled entity in the real world.

Collaboration: Efficient collaboration takes place with all phases of project information in digital format. This enables project data to be created, managed, and shared simultaneously across the enterprise, as well as with extended teams across geographic boundaries. The resulting project visibility also provides for more efficient workflow, faster time to market, and greater control of project information and activity.

Lifecycle Management: Lifecycle management solutions make it possible to give everyone on a project or in an organization easy access to essential information over the life of a project and its developed assets. Keeping entire projects in digital form lays the groundwork for extracting maximum value from

the project and its assets' lifecycles – whether it's for managing a building postconstruction, distributing a movie, or accessing a building floorplan to facilitate rescues in an emergency.

TeleCAD-GIS

The realization of today's telecommunication networks is a challenging task. Network architectures are constantly changing to meet new requirements for many new and exciting services and applications. As a result of these added new requirements, new types and mixes of traffic profiles are being introduced into these networks. To facilitate these needs, TeleCAD-GIS was developed to aid in the planning, development (design), optimization and traffic prediction, documenting and network maintenance processes. It is designed to handle many types of circuit network systems and features a powerful graphics and analysing capabilities. The software uses well-established, iterative prediction concepts, while implemented network systems were modeled using real data supplied by many regional telecom operators.

TeleCAD-GIS is a scalable Autodesk-based solution for both national and regional (local) telecommunications infrastructure networks planning, design, documenting and maintenance. It's specifically suitable for telecommunications service providers and their outsourcing partners throughout 3rd World and developing countries as it offers standard, compatible and low-cost solutions powered by widely adopted and worldwide proven technologies.

Application general features: Provides quick, efficient and valuable means for modern OSP (OutSide Plant) copper-based and fiber-optics telecommunications networks design and further implementation. By definition, OSP represents "all telecom equipment and services related to the network installation from the exchange Main Distribution Frame (MDF) or Optical Distribution Frame (ODF) to the subscriber premises (or to other MDF/ODF)".

TeleCAD-GIS has several modules dealing with various areas of customer-owned outside plant design; OSP right-of-way and route design; OSP space design; underground, direct-buried, and aerial plant design; OSP cabling hardware and OSP grounding, bonding and electrical protection systems; Automated switching and support systems design, etc. Each software module provides customized tools for specific network topology design, dimensioning, analysis and simulation.

TeleCAD-GIS maintains direct reusability of processings and resulting data within Telcos sub-systems (ERP, SAP...), as a first milestone towards successful corporate system maintenance, exploitation and management; Compatibility of TeleCAD-GIS processings within wide spectrum of national-level cadastral databases and services (geodesy, spatial planning, other infrastructure

systems...); Offers rich and updatable catalogues of standards, copper and fiber-optic cables, symbols, materials, passive and active network elements, cable shafts, conduits and ducts, etc. "Live Update" option keeps users up to date with regional Telcos' and producers' databases of standards, materials and components; Tools for a wide range of OSP network analyses and optimizations, specifications and BOM production, network scaling, cost fitting and predictions, etc.; Specially suited optional tools for geodetic plans and cadastral maps precise callibration, georeferencing, indexing and storing for further corporate use.

Product version: 2006

Categories: Communications

Product languages: Serbian, Bosnian, Croatian

Compatibility: Autodesk Map 3D 2006
Contract Limited Autodesk Map 3D 2006 (OEM)

Industry Standards: ISO/IEC JTC 1/SC 2, ISO/IEC JTC 1/SC 24, ISO/IEC JTC 1/SC 32, ISO/IEC JTC 1/SC 35, ISO/TC 20/SC 13, ISO/TC 46/WG 2, ISO/TC 184/SC 4, ISO/TC 204

Documentation: Documentation is available in both digital (PDF) and paper forms. Users receive it in a box, have it available on CD-ROM, and may download it via Inova FTP server. Every software module comes along with separate technical manual, accompanied with the general application manual and concept guide.

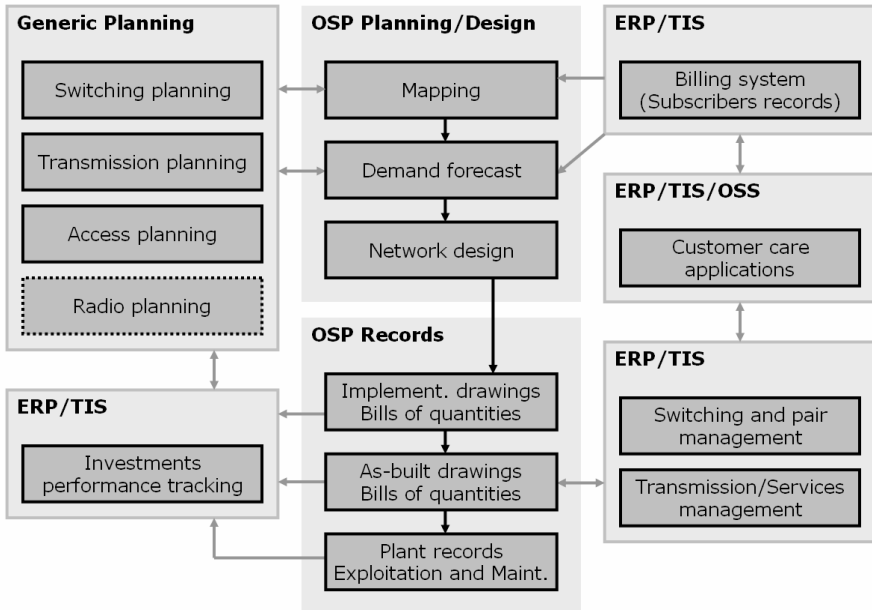
Authorization: After being installed application works in fully functional demo mode, unless hardware (USB) key is supplied. There both are SLM (Single License Mode) and NLM (Network License Mode) types of licensing modes. Only commercial users are able to receive Product Support and Product Updates via Inova FTP server.

Support and Training: Customer Support is available 7/24 both via phone and e-mail, including FAQ database stored on Web server. Training is organized twice a month either at Inova Training Center Bosnia and Herzegovina facilities situated in Banja Luka and Inova Training Center Serbia and Montenegro facilities situated in Belgrade, or at customer's premises (on-site training). Every application distributor has an obligation to run training courses monthly, at it's own premises. Major Account users receive one-time free 40-hours on-site training and support.

TeleCAD-GIS Enterprise

Highly scalable and customizable Autodesk-based enterprise solution for national and large regional telecommunications infrastructure cadastre planning, design, documenting, maintenance and corporate management.

TeleCAD-GIS Enterprise solution was designed using Enterprise Information Architecture (EIA) standards, requirements and guidelines. It's based on business functions defined by Telco's Enterprise Business Architecture and accompanying Business Model, extending across corporate boundaries.



New advancements in architecture tools and methodologies, such as visualization and Web publishing, provide improved IT analysis and communication. An Oracle-based GIS repository acts as a central place where data is stored and maintained and includes information about business processes, data and systems, including data elements, processes, inputs, outputs and interrelationships. Most importantly, the repository forms an integrated strategic information base that supports traceability of data down to the technical or source level. Generally, information users or stakeholders receive software tools divided into three levels: Strategic (investment strategy and portfolio management), Operational (business process support) and Technical (targeting systems and applications).

TeleCAD-GIS Enterprise is a scalable tool with precision and functionality of Autodesk AutoCAD, combined with power and capacity of GIS Design Server. It possesses high level of data integration by exploiting Autodesk and many other

GIS-based Import/Export functions. It offers extraordinary possibilities for thematic maps creation. It also offers communication with "Web-based" and mobile GIS solutions. Support to Oracle 9i Spatial makes the access to large quantities of stored spatial data easy and efficient. It possesses advanced tools for spatial analyses and maps creation. And, finally, TeleCAD-GIS Enterprise is an easy-to-learn and easy-to-use tool with quite simple and understandable user interface.

TeleCAD-GIS fits into the overall information technology vision of modern utilities through the use of open databases, industry-standard programming environments, and .NET software architecture. It leverages technology that is configurable and easily aligned to multiple processes using a unified strategic platform. It provides a scalable architecture for the full range of utility business needs and can be used for a single departmental installation or as a corporate enterprise configuration for creating, managing, and disseminating utility information.

- Product version:** 2006
- Categories:** Facilities Management; Communications
- Product languages:** Serbian, Bosnian, Croatian
- Client-tier:** TeleCAD-GIS 2006
Oracle 9i / 10g Client
- Server-tier:** Autodesk GIS Design Server 8 (SP2)
Autodesk MapGuide 6.5 Server
Oracle 9i Spatial Server
- Industry Standards:** ISO/IEC JTC 1/SC 2, ISO/IEC JTC 1/SC 24, ISO/IEC JTC 1/SC 32, ISO/IEC JTC 1/SC 35, ISO/TC 20/SC 13, ISO/TC 46/WG 2, ISO/TC 184/SC 4, ISO/TC 204

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Service and support

Strategic and tactical advice

Our customers apply Inova's market insights, proprietary data sets, and consulting experience toward corporate strategic and tactical planning needs. Our consulting client base ranges from service providers to equipment vendors as well as financial institutions and government agencies.

Market Analysis: Customers who leverage our in-house databases, expertise, and network of research contacts to address complex issues, including: Market forecasting and demand projections, Customer segmentation and profitability, Survey design and implementation and Customer and geographic "scoring".

Strategic Consulting: Inova has developed a reputation for objectivity and keen insight into the strategic challenges facing communications executives: Competitive analysis, Regulatory strategy, Merger and acquisition advice and Network planning and valuation.

Analyst Services: Complements customer subscription to Inova's research products with customized insight from the experts. Our service offerings include: Expert testimony, Corporate seminars, briefings, and training, Customized industry updates and Analyst access hours.

Cost, Profit, and Pricing Models: Inova provides analyses and modeling systems designed to assist with decision making and regulatory strategy: Cost model design and implementation, Business cases for new services, Competitive price benchmarking and Analysis by geography and client type.

Custom Research: In case our customer needs a specific data set Inova's analyst team welcomes custom research inquiries, large and small. Our areas of expertise include: global wireline and wireless service providers and subscribers, international telephone traffic on over 2,000 routes, terrestrial network deployments and pricing, city fiber networks and colocation facilities and internet backbone competition and connectivity.

General scopes of CAD/GIS implementation

It's important to stress out general scopes regarding CAD/GIS Development and Implementation, and Application Design and Development we are dealing at Inova. Inova is addressing and making recommendations pertaining to GIS Data to include:

- Data Storage
- Update and maintenance

- Naming Conventions
- Seamless Data Issues
- Storage Projections
- Digital Symbology Standards
- Sharing Integration and Spatial Data
- Data Translation Methods
- Precision and Accuracy
- Quality Control
- Data acquisition/Loading Standards
- Data distribution
- Data access
- Data security
- Data integration
- Meta data

It also develops products and addresses recommendations pertaining to GIS Application Software to include:

- Application Requirements Specification
- Application Development Standards
- Graphical User Interface (GUI) Standards
- Sharing Common Applications
- Joint Application Development Projects
- and identifies Potential Application Projects

Technological issues and recommendations Inova is pertaining in include:

- GIS Software Technology Limitations / Advancements
- HW & OS Technology Limitations / Advancements
- RDBMS Technology Limitations / Advancements
- Capacity and Sizing

Moreover, we are also able to make recommendations pertaining to organizational infrastructure to include:

- Staffing Requirements
- Education and Training
- Classifications

Related CAD/GIS services

Inova provides a complete range of related MIS/GIS System Development services, from Needs Analysis, to System Specification & Design, to System Implementation and Maintenance. We strive to provide the most effective

solutions to clients' needs, whether using off-the-shelf software or developing custom made programs and solutions. In an environment of rapidly changing technologies, we provide the services necessary to meet the client's needs in the on-going struggle to improve productivity and profitability. Our expertise in systems development includes:

- System Design and Engineering
- Development of custom GIS application software
- Data Access and Database Generation
- Development of Web-based Mapping solutions based on Autodesk technology
- Development of Client/Server Distributed Management Systems
- Quality Control and Quality Assurance systems
- CAD/GIS Training using Autodesk product line

Our employees and consultants are an experienced industry leaders in Digital Mapping and Data Conversion. Our experience covers a full range of data acquisition sources including hard copy map conversion, global positioning systems (GPS) and remote sensing. This expertise covers the following areas:

- Topographic and Cadastral Mapping
- Hydrographic Mapping
- Digital Elevation Modeling
- Hardcopy Document Conversion
- Data Format Conversion
- Custom Mapping Applications
- Land Use/Land Cover Mapping

Custom geospatial services

Inova is able to deliver complete geospatial solutions, including needs assessment, data integration, feature extraction, large format scanning, digitizing, CAD conversion, and technical staffing services:

Feature Extraction: Offering feature extraction from topographic maps, satellite imagery, and aerial photography. We will work with clients to fit layer extraction to the client needs, including output format, accuracy, and other elements. Standard layer datasets, such as roads and transportation networks, hydrology, buildings (contours and centroids) and contour layers, may be available off-the-shelf. Vector datasets are geographic entities stored as lines, points, and polygons. The lines and polygons are often used to represent linear features such as roads, structures, and area features such as political boundaries. Points are used to represent buildings, wells, etc. Vector data is overlaid on imagery, digital elevation models (DEM), clutter layers, or other geo-data to

display precise locations of transportation networks, environmental features, and governmental boundaries. Street density is often used as an indicator of population centers and number of potential subscribers. Contact us today for a complete needs assessment.

CAD/GIS Conversion: Specialized in the conversion of hard copy documents (mylars, sepias, blueprints, etc.) into ready-to-use, fully functional CAD (Computer Aided Design) files. The end-product is a file separated into client specified layers, line types, weights, and colors with standard, recognizable entities (walls, doors, windows, contours, rivers, roads, etc.). All features extracted from the original document are ready-to-use, thus requiring absolutely no clean-up work by the end user.

Large Format Scanning: We perfected large format scanning processes since 2001. Inova can custom scan documents up to 50 inches wide by virtually any length.

Data Integration: Providing custom integration services for commercial and proprietary geospatial datasets. Following a complete needs assessment, we will produce and format the data according to client's needs.

Digitizing: Maintaining scanning and production facilities and they both can accommodate virtually any geospatial conversion need. After acquiring the hard-to-find paper maps, Inova color-scans the maps (400 dpi-International) and digitally assigns latitude/longitude coordinates (geo-reference) each map. The product is a raster image delivered in TIFF format. Each TIFF file will be accompanied by a specific header file containing all the geo-referencing information. The file formats are compatible with most GIS, desktop publishing, GPS, and mapping software. Customers have a choice of projection, datum, and ground unit. Inova validates color consistency and geo-referencing accuracy of each map. All products are delivered either on CD-ROM or via Internet.

Technical Staffing: Inova Training Center, a business unit of Inova informatički inženjering, d.o.o. is able to supply trained, information technology (IT) professionals to your company on a full-time or project basis. These professionals can work on-site independently or fully integrated into your existing team. Inova Training Center works with clients to maximize productivity, budgets, and staffing timetables.

Other IT-related services

Strategic Planning: Branch, Department or Corporate in scope, our approach identifies the current situation and outlines the opportunities for improving efficiencies and effectiveness through the formulation of a short-term action plan or long-term vision.

Implementation Planning: A detailed action plan is constructed to meet system implementation scheduling, resource allocation and budget constraints.

Systems Database Design: The contents, format, structure and capacity of a system are designed to meet the corporate applications, user needs and ensure functionality is delivered. This includes hardware, software and network components.

Standards and Specifications: To contribute to the systems' maintenance, security, integrity and efficient operation, standards and specifications for each operational component are established.

User-Specific Software Modules: Software development of new routines that are built upon the existing software functions may be designed and integrated into the application.

Digital Project Management: Inova personnel have acted as project managers for all types of digital projects, from user needs definitions to a fully operational system, on time and within budget.

Pilot Project Design and Evaluation: A pilot project in terms of scope, data requirements, personnel training, database design, data loading, user queries and report generation is completed. This procedure also tracks resource expenditures for all phases as a means of designing a full system implementation plan. Finally, the successes and failures of the pilot are analyzed for corrective action, cost to benefit ratios and changing user needs prior to a corporate wide implementation.

Application Development: From the toolbox of functionality, a set of application specific functions are developed. Functions are tailor made to the client language content (ie. highways, water, telephone) and application of particular interest. For example, functions, which may take several steps from the toolbox, are integrated into a one step menu selection.

Training and education

In order to develop high value solutions and accompanying services for our customers, Inova is organized with our core development and professional training groups based in Banja Luka (Bosnia and Herzegovina) and Belgrade (Serbia and Montenegro). To ensure that Inova can provide customer excellence, we will be highly decentralized in services and training campaigns, keeping decisions close to the customer. In order to accomplish this, the company has established specialized Training Centers and Support Teams in both Bosnia and Herzegovina and Serbia and Montenegro.

Training standards and certification

Inova Training Centers offer quality and modern computer educational equipment, maintaining a professional training lab with equipment that showcases the power and performance of presented software tools and technology solutions:

Facilities: Permanent training room seating 12 (twelve) hands-on seats. Full-time training delegate handling and registration capability. Acceptable standard of furnishings, furniture, and decoration. Acceptable facilities for catering and refreshments. Acceptable access by car or public transport.

Equipment: Optimum branded PC configurations required to run the software taught in the classroom. Presentation equipment of the standard necessary to show the software operating (video projector). One networked PC per course attendee. Other equipment as and when required to showcase all presented software products. An Internet account to receive and send e-mail. Access from the training room to the Web.

Training Delegate Evaluation Forms: Inova Training Centers provide it's own Course Evaluation forms to all delegates attending a course. Some companies may require a sample of these completed forms to be submitted for review during the course.

Certification: Inova issues an official and region wide accepted Certificate for the skills learned and technologies adopted during the period of the training course. Before issuing a Certificate Inova has an obligation to perform an Audit for each and every attendee to the course.

Training programs

There are four running training programs available to our customers regionwide:

Inova and Autodesk-based Custom Training: For those companies that have complex training requirements - such as offices in many different locations, a regional workforce, or a solution involving multiple Inova and Autodesk products - Inova's consultants can analyze your needs and design a custom tailored training program. We provide a range of custom training programs, from customization of standard courses to development of custom curriculum.

Courseware: A key factor in the success of any training program is the use of high-quality classroom materials. Inova introduced Infrastructure planning and design Training Courseware (ITC) to support training organizations and customers who attend instructor-led, classroom training for both Inova and Autodesk-based products. ITC is authorized technical training material, developed by Inova, for traditional one-to-five-day, hands-on, instructor-led

training. It covers the most important technical features and functions of new or updated Inova and Autodesk products. ITC includes exercises that simulate real-world projects in both planning and design phase, and teaches the customer how to perform job-related tasks using both Inova and Autodesk-based software.

How-To-Articles and Tips: Through step-by-step lessons written by recognized experts in the fields of telecommunications, spatial and urban planning, civil engineering, geodesy and surveying – Inova how-to articles, tutorials and technical tips help our customers master the techniques they need to become more productive with both Inova and Autodesk-based products and solutions.

API Training and Consulting for Developers: Inova offers unparalleled API and Consulting training classes for infrastructure and spatial planning solutions – both on Inova and Autodesk-based platforms. From conceptual authors to coders, detailed descriptions and hands-on classes for developed solutions and exposed API interfaces.

Additional company information

Membership to organizations and bodies

- Bosnia and Herzegovina official representative to ICPDR (International Commission for the Protection of the Danube River) Expert team for GIS and Cartography
- Active membership to Bosnian-Herzegovinean Main Board of the UNFCCC (United Nations Framework Convention for Climate Change)
- Official jury member of International exhibition of new technologies "Millenium", Odessa, Ukraine
- Member of Implementation team for development of Integrated Spatial Information Systems (IPIS) of Bosnia and Herzegovina
- Member of Implementation team for RDBMS management and decision support, COBIS (Cooperative On-line Base and Systems), CAD Technology development and Education, Slovenia
- Member of engineering team for public water facilities "Vodovod" corporate development, city of Banja Luka, Bosnia and Herzegovina

International awards

- International Exhibition of New Technologies "MILLENIUM 2002", Odessa, Ukraine (2002): First prize and diploma for the concept: "New Communicational Model in the Planning Process of the Rehabilitation of Devastated Ecosystems".
- Ukrainian Association Of Support For Civil Initiatives "Kovcheg", Odessa, Ukraine (2002): Diploma in recognition of significant endowment in development of social welfare and public partnership.
- Roumanie Ministere de l'Education et de la Recherche, Bruxelles, Belgium (2001): Medal and diploma for significant scientific contribution to development of information technologies via new communicational model research.
- 50th World Exhibition of Innovation, Research and New Technology "EUREKA 2001", Bruxelles, Belgium (2001): golden medal and special prize for the concept: "New Communicational Model in the Planning Process of the Rehabilitation of Devastated Ecosystems".

- ICEPEC (Institut Communautaire Europeen pour la Promotion des Entreprises Commerciales), Bruxelles, Belgium (2000): Medaille d'Or for extraordinary contribution in the field of integrated spatial information systems development (Mr. Ljubiša Savović).
- 49th World Exhibition of Innovation, Research and New Technology "EUREKA 2000", Bruxelles, Belgium (2000): golden medal and special prize for the concept: "Synthesis And Building Up of The Most Modern Information Technologies For Simultaneous Support To Engineering, Design And Development of Integral Spatial Information System of The Third World And Developing Countries" (AreaCAD-GIS Concept, Mr. Ljubiša Savović).

Research publications

- Savović Lj., Šestić M., Maksimović S., (2003) "Software package Inova TeleCAD-GIS", publication and research project published at "TELFOR 2003", November 2003, Belgrade, Serbia and Montenegro
- Savović Lj., Trifković A., Šestić M., (2002) "New communicational model in the planning process of the rehabilitation of devastated ecosystems", publication and research project published at the "Millennium – The technologies of the third thousand", 11-14. April 2002, Odessa, Ukraine
- Savović Lj. (2001) "Synthesis and building up of the most modern information technologies for simultaneous support to engineering, design and development of integral spatial information systems of the Third world and developing countries" (AreaCAD-GIS Concept), publication and research project published at the 50th International exhibition of innovations and new technologies "Eureka 2001", November 2001, Bruxelles, Belgium
- Savović Lj., more than 50 published articles related to development of spatial information systems
- Šestić M., more than 15 published articles in the fields of applied Relational Database Systems (RDBS), Spatially-oriented Database Systems (GIS) and the use of Structured Query Language (SQL)

Legal notice

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