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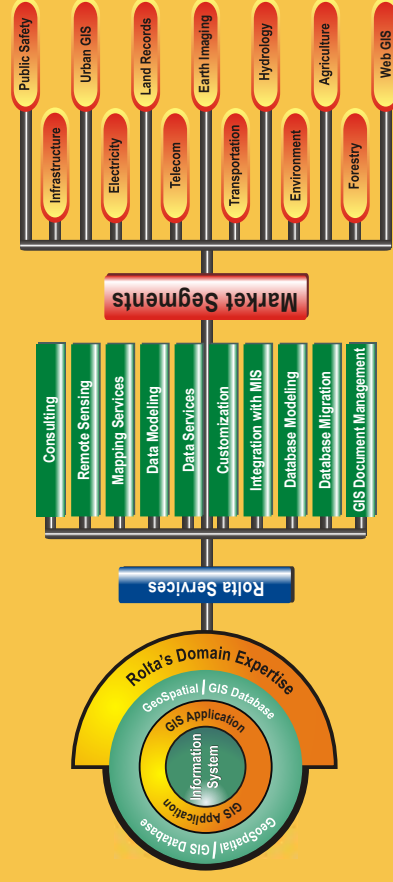


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Physical World Map



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Brenden Boyle

Chief Executive,
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With the internet and more government data being...

ON THE COVER...

The development of different tools and extensions for the core GIS has made the overall system robust and powerful and is moving on the right track.

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GIS Development is intended for those interested and involved in GIS related activities. It is hoped that it will serve to foster a growing network by keeping the community up-to-date on many activities in this wide and varied field. Your involvement in providing relevant information is essential to the success of this endeavour.

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The flying "bicycle"

Often, we hear the professionals in the geospatial industry talking about the lack of innovation in this domain. We sometimes come across the feeling, that geospatial tool has remained more or less the same with: map rendering, on-screen digitization, projection transformation, buffer, overlay, network analysis.... It appears there is not much of an innovation, if we leave the process, robustness and the user interface.

Should we feel sad about this situation, No! If we look back upon one of the earlier inventions, bicycle, the first chain driven bicycle was introduced in 1885. During the last 122 years it has not seen much change in its basic configuration, which is two wheels and a chain, except for the material used for production and gizmos that are added for the differentiator. Least to say, with over one billion of them in use, we also cannot say it does not have market and the need for innovation. And, we are happy that there has not been further innovation leading to the Winged Bi-Cycle which could fly!

Yes, we did hear some arguments recently, whether we need new GIS software. To me this debate too, does not hold much ground; else we would not have seen Korean car after Europeans, Americans and Japanese gave some beautiful piece of automobiles. Many a times a new "PRODUCT", is driven by business reasons and at times by political reasons to have an indigenous product like the manufacture of 'Proton' car in Malaysia or the strategic nurturing of the local geospatial product developers through policy statements in China.

In last couple of years we have seen a surge of open source geospatial tools including software and components. The focus in the open source geospatial tools will now move to which one has the larger user-base, in order to support community learning amongst the user-base. It would also lead to Open Source products on which private industry would be able to find the business model based on support/service.

There also appears to be excitement over the data explosion which we are seeing. While the research is on for automated data capture from these image along with better archival and fast retrieval of these images on top of excellent indexing tools, we wonder whether this will overwhelm vector based GIS?

In nutshell the development has moved from the basic design to the other dimensions like User Interface, Robustness, Indexing, Compression and Storage, Open Source, Indigenous Product, etc. But certainly, the geospatial industry is not into the further innovation of having wings being added to the bicycle.

Thankfully, we are on the right track!

From Editor's Desk



Maneesh Prasad

Managing Editor & Chief Operating Officer
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Reader's Column

Any Answers?

Reconstruction of 3-D contours from satellite

I am a regular reader of GIS Development. Recently I went through one of the articles on the portal about "Reconstruction of 3-D image from topographic map and satellite image"

I want to know more about reconstruction of 3d contours from Satellite. Could you elaborate on how to create 3D contours from satellite imagery without surveying in the field.

I would also like to know about the company/companies working on this in India.

Debasish Sahu, India

debasish.sahu@accement.com

GIS and Remote Sensing Education

I have completed PGD in Remote Sensing and GIS from the African Regional Centre for Space Science and Technology Education in English - ARCSSTEE (Nigeria). Now I intend to pursue an MSc. in Remote Sensing and GIS Arabian Gulf University. Please guide and provide information about courses in the region.

Mbinkar Kenneth

kidzefesan@hotmail.com

News Comments

GIS mapping for flood-affected Bihar, India

GIS based Flood Hazard Mapping of the Kosi River Basin, Bihar was completed in May, 2005 as a part of research programme conducted at IIT Kanpur. The results of the case study showed very satisfactory results and found useful for identifying the flood potential in the area.

The report shows that there is a high need of enforcing flood hazard zoning in the area. Public and private organizations involved in disaster management should come forward and utilize the resources available for the benefit of people.

Utilising the funds obtained from different funding agencies towards identification of factors controlling the flood hazard will be more beneficial rather than providing post flood relief to flood-affected population. Though research was conducted in the flood affected areas of Bihar, public and private organizations are not coming forward to utilize the data available and take necessary actions to identify areas of risk and prioritize mitigation efforts.

Venkata Bapalu, India

The rule of the game for disaster management and post-disaster recovery is

that any funding should be routed through government mechanism. But, the relief measures can be implemented through public participation and local NGO.

Under disaster situation, government is the sole authority not just responsible for relief planning, but also optimal allocation, coordinating with various relief assist agencies and resource utilization.

Disjointed, piecemeal efforts will not solve huge flood problem for entire region. AKRSP India is a successful example of government-donor agency effort.

Dr. Anupam K Singh, India

NATMO to launch Golden Map Service

The move is very good but it's too late if you compare with Google Earth's 3D data base of USA.

Nityanand Pattnaik, India

Indian Army to utilise Cartosat-I for satellite based surveillance and reconnaissance

If one knows what, where and who to watch, one satellite with a daily revisit capability should do fine. It also depends on who your neighbours are...

Manu Parulekar, India

Send in your **feedback** to editorial@GISdevelopment.net



GIS solution for Banking Industry in Nigeria

Nigeria: STL -Nigeria's GIS solution provider released an integrated GIS solution specifically designed for the financial industry in Nigeria. This solution involves the use of mapping software that comes with the package to interact with digital mapping data and business data such as with the location of banks, customer data, to make informed business decision. The city maps cover some 12 Nigerian cities including: Lagos, Abuja, Port Harcourt, Onitsha, Warri, Kano, Ibadan, Owerri, Bauchi, Abeokuta, Enugu, and Calabar.



Charting a new course for Bangladesh

Bangladesh: Associate Professor Akhlaque Haque, Ph.D., at University of Alabama at Birmingham (UAB) will create the first comprehensive digital maps of Bangladesh's capital city, Dhaka.

Haque is teaching graduate students at BRAC University in Dhaka to use GIS technology.

In October, he and the students, using Global Positioning System units, will travel around Dhaka collecting location-specific data on major roadways, railway stations, hospitals and other public service facilities.

The team will then import the data into GIS software to create the digital map of the city.

For one project, the team will determine alternative routes for entering and exiting the city during times of crises, including natural disasters such as the recent floods.

Infotech gets Survey of India contract

India: Infotech Enterprise Ltd has bagged a contract from Survey of India for mapping the cities of Ahmedabad and Chennai. A team from Infotech Enterprises will complete the project in four months. Around 500 sq km of thickly populated urban areas will be covered at 1:1000 scales. The features to be captured include buildings, transport network, utility networks, communication structures, water bodies, vegetation and contours. The data will be useful for application in planning, taxation, emergency preparedness and response, security, health, civic amenities.

Open source software t

India: New software developed by Zyxxware Technologies is about to revolutionize the way information is collected and processed in tracking diseases like Chikungunya and Dengue. The software is being dedicated to the nation as Free Software under the GNU General Public License (GPL). Although the software was developed for the State of Kerala, India, the GNU GPL will allow it to be downloaded and used for free by any other government in the world.

The software is web based and allows Hospitals to report cases of diseases as soon as they are registered at the hospital. The software seamlessly integrates with the existing manual process by allowing hospitals that does not have any web access to send paper based reports to data entry operators who can enter them into the system or send soft copies of the reports that can be imported automatically. The system allows secure login with role based privileges for different roles like Government



ScreenShot :Zyxxware Technologies' Opensource software for E

GIS to help farmers with soil fertility

India: Farmers will be able to avail themselves of information about soil fertility at their district and block headquarters that would also help the Department of Fertilisers to prepare and monitor equitable distribution of fertilizers and micro-nutrients. A methodology

for preparation of district level digitized soil fertility map has been standardized, which was one of the thrust areas identified for research by the government, Indian Council for Agriculture Research (ICAR) said, Assistant Director General (Natural Resource Management) P D Sharma.

The Indian Institute of Soil

e to track epidemics

Medical Official, Hospital Staff, Data Access Operators and System Administrator. The GIS interface uses Google maps to present the data on a real time basis on a map of the state. Cases of diseases are represented by

markers on the map and easy visual analysis of the pattern and extent of spread of diseases is possible.

The GIS and reporting interface processes the cases registered and present reports that can be used by the Health Department to monitor the situation on a real time basis and take precautionary measures if required. Such a system will help in preventing occurrences of disease outbreaks of the scale experienced by the State of Kerala in the last couple of years.

Main objectives in releasing the software as Free and Open Source Software is to promote the fact that it is possible to develop state of the art software at very low costs and a developing country like India does not have to languish behind other IT leaders in any areas.

Sciences (IISS) at Bhopal has undertaken the work for developing the digitised soil fertility map using global information system (GIS) and global positioning system (GPS), Sharma said.

The GIS will help identify the soil layers and integrate data while the GPS will help in identification of resources. Importantly, it

will help farmers in preparation of soil and decide about the seeds and use of fertilisers and micronutrients for a higher yield, he said.

GIS mapping to trace Elephants

India: After its role in managing natural resources, disaster management and

more recently of malaria in the State of Orissa, GIS applications have come as a great help in another key area of wildlife management, i.e. reducing man-animal conflicts.

As per a study by Chanda-ka Dampara Sanctuary authorities, the movement pattern of specific elephants, its flagship species, can now be known through proper GIS mapping over the years with the help of annual and seasonal data interpretation so that the elephant depredation can be predicted and managed properly with the help of the villagers of the peripheral areas.

Though it is still at a preliminary stage, the month-wise flow of elephant movements out of the sanctuary in co-ordination with different parameters like cropping pattern and water availability inside the sanctuary and their co-relations can be found out from the GIS study, says DFO Akshaya Kumar Pattnaik.

The current study is being carried out in consultation with SPARC, a Jaydev Vihar-based GIS consulting firm.

Tsunami Early Warning Centre inaugurated

India: The National Tsunami Early Warning Centre has been set up at INCOIS, Hyderabad. And has been established by Ministry of

Earth Sciences (MoES) as the nodal ministry, in collaboration with Department of Science and Technology (DST), Department of Space (DOS) and the Council of Scientific and Industrial Research (CSIR).

A satellite-based virtual private network for disaster management support (VPN DMS) has been established. This network enables early warning centre to disseminate warnings to the Ministry of Home Affairs (MHA), as well as to the



Command Centre: National Tsunami Early Warning Centre

State Emergency Operations Centres. In addition, Messages will also be sent by Phone, Fax, SMS and e-mails to authorised officials.

Periodic workshops will be organized for the user community to familiarize them with the use of tsunami and storm surge advisories as well as inundation maps.

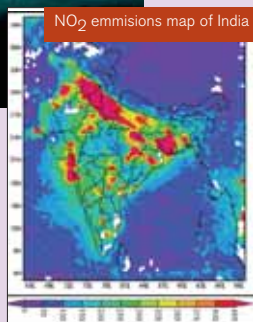
GIS mapping for Malaria

India: Faced with an uphill task of controlling malaria,

Space sensors highlight polluted air in India



Keep Planet Clean: Control Emissions



India/Italy: Air pollution is becoming one of the biggest dangers for the future of the planet, causing premature deaths of humans and damaging flora and fauna. With their vantage point from space, satellites are the only way to carry out effective global measurements of air-polluting emissions and their trans-boundary movement.

Scientists and researchers from around the world gathered at ESRIN, ESA's Earth Observation Centre in Frascati, Italy, to discuss the contribution of satellite data in monitoring nitrogen dioxide in the atmosphere and to present the latest results of their ongoing atmospheric research that includes identifying hotspots, analysing trends and monitoring effectiveness of mitigation efforts.

Satellite data used by the participants was acquired through the TEMIS project, part of ESA's Data User Programme (DUP). The TEMIS Internet-based service offers near-real time data products from various satellite instruments related to tropospheric trace gas concentrations, aerosol and Ultra Violet radiation.

According to Dr Sachin Ghude of the Indian Institute of Tropical Meteorology (IITM), rapid industrialisation, urbanisation and traffic growth are most likely responsible for the increase. Because of varying consumption patterns and growth rates, the distribution of emissions vary widely across India. In order to mitigate the causes of pollution, policy makers need to know the hardest hit regions.

Using nitrogen dioxide (NO₂) data acquired from 1996 to 2006 by the Global Ozone Monitoring Experiment (GOME) instrument aboard

ESA's ERS-2 satellite and the Scanning Imaging Absorption Spectrometer for Atmospheric Chartography (SCIAMACHY) instrument aboard ESA's Envisat, Ghude was able to identify the major NO₂ hotspots, quantify the trend over major industrial zones and identify the largest contributing regions.

"Nitrous oxide emissions over India is growing at an annual rate of 5.5 percent/year and the location of emission hot spots correlates well with the location of mega thermal power plants, mega cities, urban and industrial regions," Ghude said. "Data from the 11-year time series of GOME and SCIAMACHY provide valuable information to improve estimates of nitrogen dioxide emissions as well as to identify the source regions and to study the regional ozone chemistry in light of seasonal meteorology."

the Orissa Government is carrying out GIS mapping of all its districts. The mapping is based on sub centre wise epidemiological data of three years - 2004, 2005 and 2006.

The Regional Medical Research Centre (RMRC) here has already shown the way in this regard. It conducted GIS mapping of Angul district to carry out research work. The mapping can give complete idea about the eco-system of an area which is under GIS, vulnerable pockets, its entomological profile, correlated data as well as the disease base.

Importantly, in case of an epidemic, the changes can be monitored, while it gives a correct platform for prediction too.

NSDI (INDIA) CEO appointed

India: Brig. (Dr) R Siva Kumar, Head, NRDMS, has been recently appointed as



Dr. R Siva Kumar
CEO, NSDI

the CEO of NSDI (India). In an exclusive interview with GIS Development, when asked about the priorities of NSDI that he would like to address in the initial months, Dr. Siva Kumar said "the immediate priority is to operationalise NSDI. Towards that aim, the India Geoportal will have to become functional. Second-



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ly, the stakeholders have to operationalise their nodes to realise the objectives of NSDI."

He added that the ultimate aim of NSDI is to provide the solutions to common man based on scientific data to resolve their day to day issues.

Dr. Siva Kumar urged the industry/academia/professionals to come forward to develop applications, solutions and services on-line using the Spatial Information Processing Models. This will enable the users to derive solutions on-line without actually acquiring data or software. There is also the need to create awareness to empower the citizens through geospatial data.

Diamond Aircraft and Tiltan Systems form partnership

Israel: Diamond Aircraft Industries (Germany) and Tiltan Systems Engineering (Israel) have announced a partnership to provide LiDAR data processing services to LiDAR operators and other customers. The partnership will first address the European market offering LiDAR operators and GIS companies a service of LiDAR data processing, transforming LiDAR geo-referenced point cloud into GIS layers in a much shorter time than the services offered currently on the

market. In addition to LiDAR data reduction, Diamond and Tiltan offer customers a one stop shop for LiDAR and optical mapping using Diamond Airborne Sensing aircrafts for data collection and the new partnership for data processing.

GIS base map project for Ajman municipality

UAE: The Ajman Municipality and the Navayuga Middle East Free Trade Zones Corporation (FTZC) concluded an agreement for the development and implementation of the GIS Base Map project for Ajman. The project will be implemented by Navayuga which will bring the best expertise and professional experience for this project.

Navayuga is a spatial technology solutions company, having unique capability of GIS and mapping solutions. The AJMAN GIS will have all Road features, all Water and water body features, all Building features, vegetation features, all utility features, contours and DEM layer, all plots/parcels, all administrative units and ortho-images from specific aerial surveys and satellite images. Further, the aerial surveys in November, 2007 will enable Ajman to have the most updated and precise maps.



MapData Sciences appointed reseller of Microsoft mapping products

Australia: Sydney headquartered MapData Sciences Pty Ltd (MDS) has been appointed Australian and New Zealand reseller for Virtual Earth and MapPoint Web Services, Microsoft Corporation's web-based mapping service. The appointment of MDS to set up MapPoint Web Services and Virtual Earth customer accounts and to provide end user support is designed to meet the escalating level of interest in mapping and location services across industry and government in Australia and New Zealand.



Satellites help ensure efficient use of pesticides

France: A new service, developed in the framework of an ESA-supported project, is using satellite images to compare agricultural crop sites across Europe in order to ensure the more efficient use of pesticides.

The new service, Site Similarity Certification (SSC),

merges satellite images with conventional data like temperature, precipitation, soil characteristics and recurring natural phenomena to improve the scientific approach in defining comparable zones and the transferability of field trial results achieved in one EU member state to another.

Spatial Business Integration GmbH developed this new service as part of an ESA Earth Observation Market Development (EOMD) project.

BNSC takes over helm of International Charter

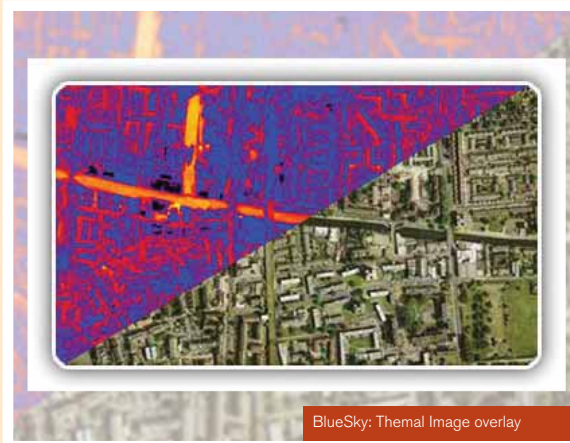
UK: The British National Space Centre (BNSC) supported by Disaster Monitoring Constellation International Imaging Ltd have taken over the rotating six-month leadership of the International Charter 'Space and Major Disasters', a joint initiative by global space agency members to provide emergency response satellite data free of charge to rescue authorities responding to major natural or man-made disasters anywhere in the world. UK company DMC International Imaging Ltd (DMCii), representing the DMC, will chair the Charter Executive Secretariat, which oversees the practical implementation of the Charter through the Partners. BNSC and DMCii take over the Chair

BlueSky thermal imagery enhances Salford Council City life

UK: Salford City Council (UK) is using a property-level thermal image map from BlueSky to improve the quality of life for local residents, tackle climate change and help meet government targets for improved housing and fuel poverty.

The BlueSky thermal image shows the relative temperature of every property in the city, helping to identify properties with high heat loss and therefore potentially poor insulation. Properties with lower relative temperatures, which may be affected by fuel poverty, can also be identified. This information is being used by the Council to effectively target

individual properties for their 'no-cost & low cost' insulation programmes and raise awareness of energy effi-



BlueSky: Thermal Image overlay

ciency among residents.

The property level thermal infrared

survey data was captured using an airborne thermal infrared sensor, a modified version of technology used by the military for night vision. Captured early evening during the winter in order to capture the widest variations in temperature, the raw survey data was processed by BlueSky to calculate heat loss values for every building polygon in the Council's Ordnance Survey mapping. The processed data was delivered to the Council as a colour coded map providing an instant snapshot of the borough and as a map-accurate dataset for use in the Council's GIS.

from JAXA, the Japanese Space Agency.

Best technologies to serve Ordnance Survey

UK: Following an extensive tender exercise carried out under the European Union Public Procurement Regulations Competitive Dialogue procedure, Ordnance Survey, the national mapping agency of Great Britain, has chosen the three-company team, led by Intergraph Corporation, to drive production efficiency, improve data consistency and support the creation of new products. The system will provide enterprise-wide

capabilities for the management, planning, coordination, and control of data capture and production activities.

SSTL satellites sign-up for 2008 launch

UK: Surrey Satellite Technology Ltd (SSTL) is to launch two new enhanced Disaster Monitoring Constellation (DMC) satellites in the fourth quarter of 2008. Deimos-1, which was built for Deimos SL (Spain) and SSTL's UK-DMC2 will be launched onboard a Dnepr rocket from the new Kosmotras launch site in south-

ern Ural. Both Deimos-1 and UK-DMC2 will carry an enhanced version of the DMC wide area imaging system, providing 600km wide swaths of the Earth in three spectral bands at a ground resolution of 22-metres. This is an advance on the current 32-metre DMC imager, which has been successfully providing imagery for over five years in the current constellation of five spacecraft. The improved resolution and capacity enable the system to better meet European Global Monitoring for Environment and Security program needs.



PCI Geomatics upgrades Geomatica Software

Canada: PCI Geomatics, announced the release of Geomatica 10.1.1. This release features enhancements to sensor support as well as additional functionality within the software.

Supported in Geomatica 10.1.1 is Kompsat-2, the high-resolution satellite belonging to the Korean Aerospace Research Institute (KARI).

An eye on emissions



UK: As EU limits on air quality threaten airport expansion, a UK university team has developed laser radar technology to produce a reliable estimate of aviation pollution and better understand how it acts on and around the runways.

Dr Michael Bennett at Manchester Metropolitan University's Centre for Air Transport and the Environment is leading the project.

His team replicated technology used in the US to create their own 'eye-safe' Light Detection and Ranging (LIDAR) device to track aircraft emissions.

One of the main issues the team had to take into account was the vortices formed when an aircraft takes off and lands. When on the ground and the engines are running ready for take off, the heat of the

emissions mean they rise, but the vortices formed as the aircraft lifts or descends pushes the emissions downwards, potentially increasing their impact.

The team was originally funded by the Department of Transport to take measurements at Heathrow and is now carrying out further tests at Manchester airport backed by the EPSRC.

Other satellites fully supported in this release include:

- CBERS - China-Brazil Earth Resources Satellite
- DMC - Disaster Monitoring Constellation
- ROS-B, Earth Resources Observation Systems

Project Porchlight selects DMTI Spatial

Canada: DMTI Spatial (DMTI), provider of Location Intelligence has been selected by One Change, not-for-profit organization that runs Project Porchlight, to enable the accurate map-

ping of residential addresses across Canada.

Using DMTI's Location Hub Address Points, Project Porchlight can pinpoint the location of every single household within a certain boundary area ensuring that the right numbers of light bulbs are made available for volunteers to deliver.

Project Porchlight promotes energy conservation through individual action. The goal of the project is to get households everywhere to change one old-fashioned, inefficient incandescent bulb to an energy-efficient CFL bulb.

MAPPS praises new Space Commerce Bill

USA: MAPPS, the association of private geospatial firms, praised legislation being sent to Congress by the Bush Administration to restructure the Office of Space Commercialization. The bill would rename the agency as the Office of Space Commerce and establish as one of its statutory missions to "promote the advancement of United States' geospatial technologies related to space commerce."

The "Space Commerce Act" would strengthen and

provide more focus for the new Office of Space Commerce (OSC). An office within the National Oceanic and Atmospheric Administration (NOAA), the OSC, would lead the Federal government's effort on space commerce policy.

Geosemble Technologies awarded US Air Force map fusion contract

USA: Geosemble Technologies, Inc. has won a Phase II contract from the US Air Force Office of Scientific Research to automatically extract and fuse informa-

tion from maps with satellite imagery.

As part of the program, Geosemble Technologies, in collaboration with the University of Southern California, will build upon its work in map fusion and imagery analysis to refine its GeoMap System, designed to locate, register, and automatically extract textures and text from maps to support imagery analysis for a range of users.

The GeoMap system is designed to automatically find online maps out of various types of online images and then extract road layer, text and road intersections from raster maps by applying a sequence of image processing techniques. GeoMap then matches maps with imagery by matching extracted intersections and road vector data intersections, and then applies a patented, Digital

Rubber Sheetting technique to automatically align maps with imagery.

Fortified GIS in the making

USA: Fortified Intelligence, a unit of Fortified Holdings Corp., has acquired intellectual property for state-of-the-art geospatial software and has named Martin Chapman as the Chief Software Architect.

The company is developing a software suite with plans for a release in late 2007 under the name Fortified GIS.

The Fortified GIS suite is being developed to enable users to rapidly update geospatial information layers in an image or other dataset, allowing remotely sensed data to be turned into useful, value-added information. Users of Forti

fied GIS products can range from deployed "tactical" decision-makers, to geospatial analysts, to web developers, to corporate planners presenting decision-support information based on location-specific information.

Latest Autodesk contribution to Geospatial Open Source community

USA: Autodesk, Inc. announced it plans to donate coordinate system and map projection technology to the geospatial open source community. The software, acquired from Mentor Software and its founder Norm Olsen, will help users to more easily support geographic coordinate conversions and allow accurate and precise geospatial analysis.

The announcement was made at the annual Free and Open Source Software for Geospatial (FOSS4G) conference in Victoria, Canada.

The technology is presently embedded in Autodesk's own software products, including AutoCAD Map 3D and Autodesk MapGuide Enterprise, and is used many organizations worldwide.

The company expects to donate the software as an open source project to OSGeo by the end of 2007.

Jerry Landis, Aerial Photographer Pioneer

USA: Jerry Landis began flying and taking pictures from planes in the mid-1950s. He started his first aerial photography business in 1958 and grew Landis Aerial Surveys to a national company before selling it in 1989. But, Jerry went on to start two more aerial photography companies, AirPhotoUSA and Aerials Express. Jerry passed away on October 8th, 2007 after a courageous battle with brain cancer. His enthusiasm for life, and the aerial photography business, is carried on by his son Bill Landis at their company Aerials Express - which provides aerial photography throughout the US.

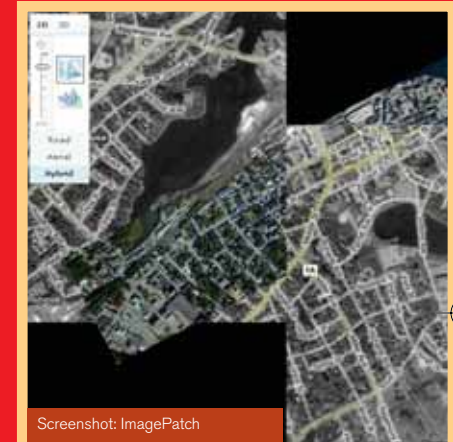


Jerry Landis

TerraPixel launches ImagePatch

USA: TerraPixel Corporation launched a new Web-based means to order small-scale high-resolution ortho imagery for 20-300 acre sites in the United States. The interactive online ordering system is built on Microsoft's Virtual Earth platform.

ImagePatch provides the means to define an area of interest via an interactive Web site and choose the quality of the ortho imagery in 3, 6 or 12 inch/pixel resolution. Users then specify the format that



they would like delivered. TerraPixel flies and collects the imagery throughout the Northeast and has built a network of professional aerial providers to collect imagery in the rest of the country.

ImagePatch is targeted at CAD/GIS professionals that need to update specific project areas, real estate professionals and land developers that need to manage their portfolios, and local governments that want to save money by updating newly developed areas rather than flying the entire area every year. The imagery imports seamlessly as an image base layer for drawings or for upload on Web-based mapping sites, such as Image Connect, Microsoft Virtual Earth, Google Earth, Leica Titan and Skyline Globe. Patches can be published into the core image database of Google Earth and Virtual Earth for public viewing at the customer's request.

GRASS 6.2.3 RC1 released

Italy: A first release candidate of the new 6.2.3 has been published recently.

Some issues which have been resolved are:

- gis.m: georectifier tool documented
- r.out.bin: fixed too short buffer which would sometimes crash R-GRASS interface
- v.db.update: backported fixes for numeric value types
- GUI crash of g.region with accented characters (non English locale)
- gis.m: maptool crash fixed

Topcon GLS-1000 Laser Scanner released

The Netherlands: Topcon Europe Positioning introduces its new laser scanner, the Topcon GLS-1000 which handles like a total station but delivers a total



Topcon GLS- 1000

scanning solution. Users can specify the scan area with jog shuttles control, work with an on board control panel to store data in the easy accessible SD card. The SD card allows users to transfer and check the data on a PC while in the field if required.

The inbuilt Wi-Fi allows PC connection if more detailed control or checking is required while scanning. In contrary to existing laser scanners, the GLS-1000 is equipped with exchangeable internal batteries and a control panel.

Topcon GTS-750 and GMS-2 Pro introduced

The Netherlands: Topcon Europe Positioning has released a new series of Mid-range workhorse surveying total stations, the GTS-750 Series. The GTS-750 will replace the existing GTS-720 Series.

Improvements

- Design is 8% smaller than previous model.
- Back lighted keyboard and larger keys.
- Increased RAM size to 128MB.
- Full USB interface support (for memory stick etc).
- New battery BT-65Q. Operating time with distance measurement; 10 hours

The GTS-750 Series features

- Windows CE.NET operating system running Topcon TopSURV on-board software.

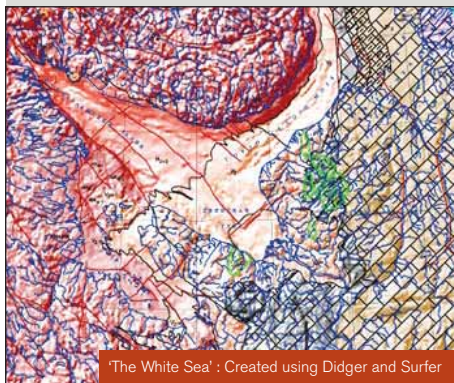
- 3,000m prism measurement range. (GTS-755; 2,000m)
- +/-2mm+2ppm prism measurement accuracy.
- Large colour LCD graphic display.
- Multiple data interface; CF card, Mini USB and USB.
- Three models available with 1", 3" or 5" angle measurement accuracy.

It also released the **GMS-2 Pro**, an integrated distance meter, offset measurement, an image height/width measurement and a high



Topcon GTS-750

Golden Software releases Didger 4



'The White Sea': Created using Didger and Surfer

USA: Golden Software, Inc. has upgraded Didger, software that provides a single user interface for digitizing, geographic referencing, reprojection and coordinate

conversion, and mosaicking, with newer features and enhancements. Among the many new features is the ability to have Didger automatically digitize polylines and polygons from any source image. Didger also includes the ability to link directly to the USGS TerraServer database. Users can download and import georeferenced satellite imagery and topographic maps of the United States free of charge.

Two other upgrades to Didger 4 are increased Surfer compatibility and more image importing options. Users can also import files in LizardTech's MrSID format and ER Mapper's ECW format.

level of mobility in the well known handy format of the GMS-2. The GMS-2 Pro also has an option that increases real-time correction capabilities of the GMS-2 hand-held receiver- the addition of a BR-1 Coast Guard beacon receiver. The Coast Guard beacon is a free, land-based radio signal that is not easily interrupted by obstructions - trees, buildings and natural terrain obstacles. The new receiver will automatically select the best correction of the four signals available to

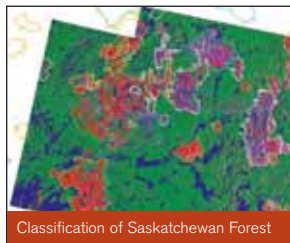
send to the Topcon GMS-2, a function making the BR-1 a smart correction option for the GMS-2.

Ghana Street Maps released by Proxy Logics

Nigeria: Proxy Logics Nigeria announced the release of detailed geographic databases of major roads for and city streets for five major cities in Ghana. Ghanaian City street maps are now available for Accra, Tema, Sekondi, Sunyani and Cape Coast. Designed to deliver accurate positional data, assist organizations track their assets, and provide accurate base level mapping. Proxy Logics street map products provide numerous vector layers and attributes. Proxy Logics Nigeria Major Roads & Highway data sets is an effort for street database creation in West Africa.

SARscape supports TerraSAR-X-1

Switzerland: Francesco Holecz, CEO of SARMap S.A. and Bernhard Kortmann, CEO of CREASO, in collaboration with AreSys and Pri-vateers, have developed



Classification of Saskatchewan Forest

SARscape; a modular set of functions dedicated to the generation of products based on airborne and space borne SAR data.

SARscape is available as an add-on to ENVI, the software solution of CREASO GmbH and ITT Visual Information Systems, or ArcView. A key aspect of SARscape, is the capability to process and combine SAR data from all past, existing, and forthcoming space borne systems, hence enabling to generate dedicated SAR based products containing the most comprehensive information. The optical algorithms included in ENVI, the synergy between SAR products and optical data is fully supported, making this software environment, from a remote sensing point of view, complete and powerful.

Optech upgrades ALTM-NAV

Canada: Optech Incorporated, a provider of advanced LiDAR survey instruments, announced a major upgrade to ALTM-NAV integrated mission planning, navigation, and operations software through the incorporation of underlying digital elevation models (DEM).

With this upgrade, ALTM-NAV users will be able to plan airborne missions more effectively and



Screenshot: ALTM-NAV LIDAR solution

efficiently using ancillary DEM information from a variety of sources. Since mission success is often gauged by the ability to collect complete data in the most efficient manner possible, an underlying DEM will enable planners to be aware of topographical changes that may affect swath widths and resultant planned flight line overlaps.

Similarly, real time projection of the LiDAR data onto the underlying DEM will enable system operators to verify coverage in the air more effectively before leaving the survey site to return to base.

VLS releases LIDAR Analyst 4.2

USA: VLS announced the new release of LIDAR Analyst 4.2 for ArcGIS. LIDAR Analyst simplifies the collection of 3D GIS features, such as buildings and terrain. Important new tools and capabilities are added with the release of LIDAR Analyst 4.2, including:

- Batch processing of multiple LiDAR data files
- Direct export of 3D buildings to Google Earth
- Additional contour and

Technology Preview: Microsoft Virtual Earth -3DVIA

USA: Dassault Systèmes (DS), 3-D and product life-cycle management (PLM) solutions provider and Microsoft Corp.



3D Model integrated in Virtual Earth

launched Microsoft Virtual Earth -3DVIA. This free online application, developed by Dassault Systèmes, allows consumers to create realistic 3-D models, such as of buildings and structures, and then share them through Microsoft Virtual Earth (MVE) and online communities.

Virtual Earth -3DVIA allows anyone to do the following with their ideas:

- Create. With just a few clicks, users can easily design a 3-D model of their house, favourite building or any structure, then select from different visualization options, textures and colours to give their 3-D model a style of its own.
- Publish. Users can upload their 3-D models to Virtual Earth, specifying an address or neighbourhood so they can experience the model within a real-life context.
- Share. Users can add their 3-D model to collections, and share it with friends and colleagues through Web communities.

attribution tools for terrain and vegetation features

- Control point analysis to compare extracted elevation values to ground truth control points

GeoPerspectives releases Wales photomap

UK: GeoPerspectives released an up-to-date aerial photomap of the whole of Wales. The highly detailed, full colour photography covers approximately 20,000 square kilometres at 25cm resolution.

A highly accurate Digital Terrain Model (DTM) has also been created from the original data. With individual height values every 5 metres, each with a positional accuracy of better



Aerial Photo: Penrhyn, Wales

than 1.5 metres, this model provides a detailed and accurate representation of the earth's surface for a wide range of applications including environmental modelling, flood risk assessment and 3D visualisation.

Virtual Earth updates Birds Eye View

USA: October 13: Birds Eye views of dozens of cities around the world were added to the Virtual Earth

platform. You can access them at Live Search Maps or integrate them into your own applications with our Map Control. 10TB of new imagery went out in this release along with 28TB of refreshed street map tiles. The October imagery release is one of the largest for Birds Eye in a while, featuring coverage in Madrid, Stockholm, Copenhagen and few regions in the UK and US.

Stickymap.com launches free community organization mapping tool

USA: Stickymap.com, a social action website sponsored by Neighborhood Resources LLC of Weston,

CT, launched a free community organization mapping tool. It helps non-profits and other community organizations demonstrate their impact in their neighborhoods as well as their relationships with local businesses. Stickymap provides an interactive interface that facilitates collaborative community support and learning. The map provides a graphical representation of the neighbourhood and has an interface that allows the community to upload photos and leave comments about locations on the map. Stickymap.com technology was developed by Yale University graduates Max Sklar and Daniel Wiznia.

National Geographic and MetaCarta introduce CartaLens

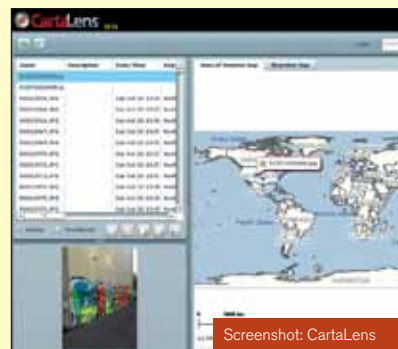
USA: National Geographic Maps and MetaCarta, Inc., provider of geographic search and referencing solutions, announced CartaLens, an innovative geospatial digital asset management solution for georeferencing, managing, retrieving and delivering digital assets.

CartaLens is able to search and retrieve location-based information from both structured content and a broad base of digital content such as photos, video, audio and documents, enabling users to fuse digital assets with maps and metadata in a collaborative and interactive view-

ing environment. By accessing the CartaLens results dynamically in Google Earth, users can collaborate with their team of subject matter experts in real-time and mix this critical intelligence with other available sources in a 3-D environment. CartaLens enables users to focus the "Lens" on maps, media, metadata and all-source textual information:

- Map-centric Access enables users with constant locational information. All digital assets within the selected search area will appear on the map as icons. Users can click on any point feature on the map to view that asset along with its associated metadata.

- Media-centric Access allows users to identify, organize and locate content by clicking on the asset's thumbnail or detailed data. The map will illustrate where each asset is located providing a quick accurate visual reference that makes it easy to see how assets are related geographically.



Screenshot: CartaLens

- Data-centric Access enables users to query metadata to identify, view, categorize and map assets.



IT MAKES A BIG DEAL OUT OF THE TINIEST DIFFERENCES.

If you need a printer capable of discerning and displaying miniscule colour shifts, you'll value the HP Designjet T1100 Printer Series. It's ideal for creating highly accurate large-format maps and satellite images, ensured by a vast colour gamut, excellent colour transitions, and precision line accuracy, letting you make impeccable decisions based on precision prints. And client presentations easier with the crisp text and high-impact colours afforded by HP's smudge-resistant Viverra inks. Better still, this advanced printing solution also boosts productivity. With HP Easy Printer Care and HP Job Centre[®], it gives you the power to maintain, manage and control your print outputs and print environment with ease. So do your drawings, renderings and designs justice with the HP Designjet T1100 Printer Series, because flawless realities begin with flawless prints. What's more, with our comprehensive portfolio of HP Care Pack service, you can increase printer uptime and keep operating costs low.



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Component View: Leica TPS 1200+

USA: Leica Geosystems introduces survey grade total station with enhancements in accuracy, productivity, and scalability in their new Leica TPS1200+ Total Station.

Users no longer have to trade

pointing accuracy to gain the convenience of robotic instruments. In combination with the new positioning camera, the Pin-Point

improve the overall instrument distance accuracy, a new red-diode EDM has been designed to bring the base EDM accuracy to 1mm.

Built in DXF file support makes

Leica introduces Leica TPS1200+

reflectorless EDM range and accuracy has increased two fold.

The improved features of the telescope and the new high contrast color display make this instrument the best in its class.



To improve instrument performance to reflectors, a new CMOS camera system has been developed.

This camera now makes pointing accuracies of 1 sec possible. To

sure that all drawing programs are supported both in the field and in the office. Improved Automatic Target Recognition (ATR) sensors in the TPS 1200+ follow the prism with precision.

With Leica's SmartStation, SmartRover and SmartPole options, the user can customize their surveying equipment to their specific tasks, crew's needs and budget. Leica System 1200 combines TPS and GNSS in the most efficient and complete way. System 1200 is a complete solution that is ready to be expanded when you are

Mladen Stojic and Christopher Tucker joins LGGI

USA: Following the recent acquisitions of Acquis, ER Mapper and IONIC, Leica Geosystems Geospatial Imaging announced that Mladen Stojic, former Director of Enterprise and Visualization Solutions, will join the management team as Senior Vice President, Product Management and Marketing. Christopher Tucker will join the management team as Senior Vice President, National Programs, with purview over U.S.

Defense, Intelligence, Homeland Security and associated Federal Programs.

Stojic will greatly assist in Leica Geosystems' integration and growth, providing direction in product management and marketing strategies. With over 10 years of experience within Leica Geosystems (including time at ERDAS), Stojic has extensive product development and management experience, coupled with a broad understanding of the rapidly expanding geospatial markets. Sto-

jic has held several positions within the company, including Photogrammetry Product Manager and Platform Extensions Product Manager. Since 2004, Stojic has been the Director of Enterprise and Visualization Solutions, spearheading the market strategy and vision for Leica Geosystems' growing enterprise and visualization portfolio, including Leica TITAN, Leica ADE and Leica Virtual Explorer. Tucker is former President and CEO of IONIC Enterprise, Tucker will continue to manage IONIC

Enterprise during its integration into Leica Geosystems over the next several months. In his move to Leica Geosystems, Tucker will continue his Board seats with the Open Geospatial Consortium (OGC) and the U.S. Geospatial Intelligence Foundation (USGIF).



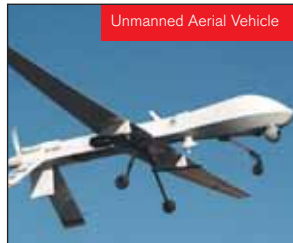
Christopher Tucker



Mladen Stojic

Leica develops TAMS

USA: Leica Geosystems Geospatial Imaging announces the develop-



Unmanned Aerial Vehicle

ment of a new Tactical Airborne Mapping Surveillance (TAMS) system. TAMS is platform agnostic, with a multi-sensor payload capable of in-theater fixed wing, helicopter and Unmanned Aerial Vehicles and Unmanned Aerial Systems (UAV/UAS) deployment.

Leica Geosystems recently began testing the tactical mapping system, responding to interest in end-to-end sensor software capabilities within the Department of Defence, and specifically by military

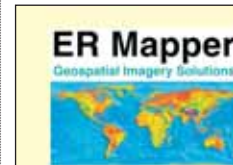
services responsible for in-theater data collection. This system includes various swappable sensors and software components, designed to produce National Imagery Transmission Format (NITF) compliant imagery supporting forward area mapping requirements. Also in this system, a swappable multi-sensor configuration supports a wide range in CONOPS.

Logging thousands of hours of design, integration flight and product testing, the team completed its extensive testing of the TAMS-Heavy system (300 lbs payload) during NSA's Empire Challenge 2007 (EC07). During the July 2007 exercises, the team successfully produced numerous NITF compliant image products within hours of the actual mission, from more than a terabyte of raw data. The final UAV (20 lbs payload) testing begins in

November 2007 and concludes in January 2008.

LGGI announces plans for ER Mapper solutions

USA: Leica Geosystems Geospatial Imaging announces plans for Earth Resource Mapper's portfolio of solutions. By acquiring ER Mapper, Leica Geosystems amplified its enterprise delivery capabilities,



supplementing its existing remote sensing applications that author, prepare, compress and deploy imagery.

ER Mapper Professional will immediately benefit from the integration of existing features and functionality from Leica Geosystems' ERDAS IMAGINE product suite. A new

release scheduled for early 2008 will create a more robust and interoperable remote sensing solution for the market.

Several of ERDAS IMAGINE's raster and geometric modeling tools will be incorporated into ER Mapper Professional. A new release of Image Compressor is also planned for 2008 and the free trial version will continue to be offered.



Additionally, ER Viewer will implement compatibility with the Microsoft Vista operating system.

Leica ADE with Oracle 11g compatibility released

USA: Leica Geosystems Geospatial Imaging released a new version of Leica ADE, with the ability to handle Oracle 11g data. Leica ADE contains web-based and mobile enterprise applications for editing Oracle Spatial data in both a connected and disconnected environment. Extending the value of Oracle, Leica ADE combines business information with geospatial content.

Leica ADE provides editing of user-defined data types, including Shapefiles (.shp) as well as being fully integrated with the Oracle Database and Application

Server, the new version of Leica ADE also offers enhanced digitizing capabilities and support of Oracle MapViewer, a J2EE service for rendering maps managed by Oracle Spatial.

MapViewer features supported by Leica ADE include the Linear Referencing System, GeoRaster and Workspace Manager.



Mobile Mapping with Leica ADE

iASPEC receives ESRI Business Partner Award

China: Shenzhen (iASPEC) Software Engineering Company Limited ("iASPEC"), has been granted a "2007 Business Partner Award" at the 2007 China Conference ESRI.

iASPEC is the exclusive strategic partner of China Public Security, which has independently conducted many GIS projects, including the Public Security Department's GIS system of Guangdong Province, the

Public Security Bureau's GIS systems of Shenzhen City, as well as the Public Security Bureau's GIS projects of Zhuhai City, Shantou City and FoShan City. Currently, some of the technological index of iASPEC's Police Geographic Information System platform has been successfully entered in the standard candidate list of the National Public Security Police GIS system and has the chance to be adopted as standard to be promoted to the whole country in future.

Oman Air official carrier of ESRI MENA conference

Oman: National airline Oman Air is the official carrier of the tenth 'ESRI Middle East and North Africa (MENA) Users Conference' to be hosted by Khatib & Alami and Partners in Muscat. The conference will be held under the patronage of Ahmed bin Abdulnabi Macki, minister of national economy and deputy chairman of the Financial Affairs and Energy Resources Council. Hassan bin Taleb

Al Lawatia, country manager of Oman Air, stated that the airline sponsored the event for its significance, noting that this conference is the premier event for ESRI GIS users in MENA region, who gather to meet fellow users and share their experiences and challenges.

Al Lawatia said that GIS is now a utility, which cannot be ignored. However, experiences in the region still do not meet users' requirements, as many new concepts are still absent.



Screenshot: ArcPad Edition, GPS-PhotoLink

USA: GeoSpatial Experts introduced the ArcPad Edition of its GPS-Photo Link photo-mapping software. The GPS-Photo Link software automatically links digital photographic images with GPS location data and then accurately maps the photographs in their correct georeferenced locations on a GIS layer. GPS-Photo Link creates web pages in which the watermarked photographs are integrated with satellite imagery, street maps, or other GIS-based mapping layer. The software enables users

data collection device. GPS-Photo Link ArcPad Edition automatically creates a new ArcPad record and georeferences it to the correct location in the GIS data layer. Multiple photos can be linked to the same record, allowing user to take pictures from several angles and store them as attributes. Once the record is created, the user can proceed to record other attributes in the ArcPad interface screen.

In the map update mode, the ArcPad Edition enables users to take existing GIS data

ArcPad edition of GPS-Photo Link now available



Screenshot: GPS Photo-Link

to display their photo locations as icons in a Google Earth map layer and add arrows indicating the directions in which the photos were taken.

The new version runs inside of ESRI's ArcPad software on any standard field data collection device, PDA or mobile GIS system that can communicate with a GPS receiver. The photo-mapping software also requires a Bluetooth or WiFi compatible digital camera, which wirelessly transmits photos to a

with them into the field and access records from any ArcPad layer.

GPS-Photo Link lets them acquire new digital photographs for inclusion in the attribute fields of a given feature. Other attributes can be updated in standard fashion using the ArcPad menu. Once the user returns to the office, the ArcPad files can be uploaded with the photos into the GIS for immediate updating of the appropriate data layers.

Traffic Management Centre

ESRI UK launches TrafficFlow

management of traffic orders throughout their

will ultimately improve service delivery to its citizens through safer and better managed highways. The software enables local authority departments, including engineering, legal, and enforcement to work on a single view of a traffic order, thereby avoiding the administrative errors that can arise from weak version control, whilst introducing robust, high quality processes.

By increasing efficiencies of the traffic order process and accuracy in traffic order information, local authorities will have more confidence in upholding parking enforcement penalties and reduce the cost of administration including appeals.

UK: ESRI (UK), provider of geographically enabled software solutions announced the launch of TrafficFlow, traffic order management system that enables local authorities to manage the entire traffic order process and realise the full benefits brought about by Decriminalised Parking Enforcement (DPE).

TrafficFlow is an end-to-end software solution that supports the

lifecycle from the outset of an initial scheme request through to the enforcement of a traffic penalty and ongoing change management. TrafficFlow helps local authorities enforce traffic restrictions with confidence through improved accuracy of traffic order information and it



PARTNERSHIP

China TransInfo partners with ESRI

China: China TransInfo Technology Corp., GIS technology provider for the People's Republic of China government's Transportation, Land & Resource and Digital City segments, announced that it has entered into a strategic partnership with ESRI. China TransInfo, through its subsidiary Beijing PKU ChinaFront High Technology Co., Ltd., offers a full range of GIS application solutions that cover GIS system planning, deployment, system construction,

data testing, system audit & optimization, documentation and customer training through proprietary GIS platform software products for 2D and 3D GIS system models.

As an ESRI global strategic partner, China TransInfo can participate in ESRI's global network, enabling the Company to exchange GIS technology with other ESRI partners throughout the world.

China TransInfo will benefit from increased brand recognition, while at the same time enhancing its overall technological strength and capabilities among potential GIS customers.

Cartosphere, ESRI France and Maporama in a strategic partnership

France: Maporama Intl., geocentric localization services provider, announced the signing of a co-publication agreement with Cartosphere and ESRI France. Through this agreement, Maporama International is providing its expertise and know-how to Cartosphere and ESRI France in the area of high-availability Web Services hosting and management.

ESRI France provides its users with a full catalog of geographic data, used locally, either at the client's workstation, or on an inter-

nal server of the user entity. For the online display of its content, Cartosphere and ESRI France have selected Maporama Intl. for its expertise in providing a remote geographic information consultation service, available 24/7.

As soon as it is launched, all Cartosphere content, including the new France Raster collection, and all of the components of the CS Raster TeleAtlas and CS Raster Navteq collections, will be available to ESRI France clients. By the end of 2007, many other components will be offered in the form of Web Services, and so the range of services will grow over time.

Google Earth worries ISRO Chief

India: The Indian Space Research Organisation (ISRO) chief has expressed concern at high-resolution



satellite images offered by Google and said authorities should hold a dialogue with it over the display of imagery of some of country's sensitive locations.

"...Some of the places, they have collected images from foreign satellites and that comes to one metre (resolution) and better,"

ISRO chief G Madhavan Nair said. "We have to have a dialogue with them, convince them that in the global interest, especially in the security environment we are facing today, we should not be putting fine details on a public domain," added Nair

NetOwl integrated with Google Earth

USA: NetOwl, an advanced multilingual text mining platform developed by SRA, is now fully integrated with the Google Earth service. This new capability enables knowledge workers to rapidly analyze, geotag, and geoparse large amounts of unstructured data from a diverse number of sources and languages, and it georeferences the results in new and innovative ways

through Google Earth. It also provides the ability to fuse structured and unstructured data and imagery, and to tailor specific requirements to their individual needs, increasing accuracy and enhancing productivity in searching, collecting, and integrating information and data.

NetOwl's unique and highly accurate capability of automatically extracting and geocoding key semantic concepts from texts, and its integration with Google Earth, offer seamless visual representations of seminal information, relationships, and key trends.

News: GeoEye

GeoEye CEO felicitated

USA: GeoEye, Inc., producer of satellite, aerial and

geospatial information, announced that CEO Matthew O'Connell received the prestigious Intelligence Achievement Award for Industry from the United States Geospatial Foundation (USGIF). O'Connell joined ORBIMAGE in 2001 and led the company through the merger with Space Imaging in 2006 when the two companies combined to create GeoEye.

He joined the company after a failed launch in the fall of 2001 and guided the company through a bankruptcy in 2003 and the unexpected loss of OrbView-3 in March 2007.

"This award from the USGIF is a great honor. It's a tribute to all the men and women of GeoEye who make our success possible," O'Connell said.

Google launches global cleanup weekend with Google Maps

USA: Google has today teamed up with dozens of community action organizations around the world to coordinate an International Cleanup Weekend on October 13-14th. Originally started as an internal Google project to encourage



Googlers to cleanup their local beaches, parks, and trails close to home and to share their progress using My Maps, the initiative is now being launched publicly in coordination with

community action organizations in fifteen countries. In the United States, Google has partnered with Keep America Beautiful, Idealist.org, the Sierra Club, AmeriCorps, and the Student Conservation Alliance in an effort to demonstrate how local cleanup efforts can collectively foster community awareness of the environment at large. To coordinate and document this global initiative, participants are encouraged to create and submit maps of their intended cleanup areas in Google Maps. Instructions on how to get started are here: <http://maps.google.com/help/maps/cleanup/>. So far more than 100 cleanup maps have been created by Googlers chronicling the areas they intend to pick-up with friends and family.

GeoEye insures its GeoEye-1 satellite

USA: GeoEye, Inc. announced that it has successfully secured approximately USD 270 million of launch and first-year on-orbit insurance for its next-generation GeoEye-1 satellite. This insurance was obtained at a premium rate that was less than previously anticipated. In addition, the Company has received USD 40 million of insurance proceeds resulting from the loss of its OrbView-3 imaging satellite



GeoEye 1: Ready for launch

earlier this year. The payment represents the full amount of the insurance claim and will be recorded as a gain in GeoEye's third quarter financial results.

Once operational, GeoEye-1 will be able to discern objects on the ground 16 inches in size or larger. More importantly, the satellite will be able to locate an object that size to within about nine feet of its true location on the surface of the globe. Imagery from GeoEye-1 will be in color or in black and white.

DigitalGlobe unveils first WorldView-1 images

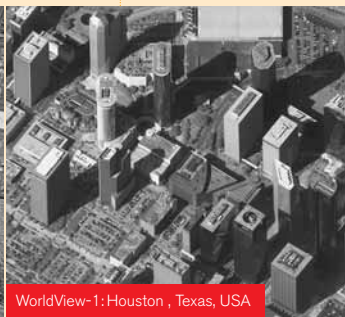
USA: DigitalGlobe revealed the first images from WorldView-1. WorldView-1 was successfully launched on September 18 from Vandenberg Air Force Base and has been undergoing a routine calibration and check-out period. DigitalGlobe expects

Smith, chief executive officer of DigitalGlobe. "Knowing that the satellite continues to undergo final calibration in the coming weeks, we expect the quality of WorldView-1's imagery to improve even more."

WorldView-1's first images include half-



WorldView-1: Yokohama, Japan



WorldView-1: Houston, Texas, USA



WorldView-1: Addis Ababa, Ethiopia

WorldView-1 to be fully operational and delivering imagery products by the end of the year if not sooner. "The quality and resolution of WorldView-1's first images is demonstrative of the superior level of imagery and geospatial information we expect to deliver to our customers," said Jill

meter snapshots from:

- Houston, Texas, USA acquired Oct. 2, 2007
- Yokohama, Japan acquired Oct. 5, 2007
- Addis Ababa, Ethiopia acquired Oct. 5, 2007

To view the images online:
http://www.digitalglobe.com/worldview-1_images.html

DM Solutions and DigitalGlobe partners

Canada: DM Solutions Group (DMSG) and DigitalGlobe announced from the FOSS4G conference in Victoria, BC, Canada, that DMSG will resell DigitalGlobe data and web services through a partnership agreement. The focus of this relationship will be delivery of data and web services to DMSG's existing customers and users of MapServer, MapGuide, and OpenLayers technologies. DigitalGlobe will provide geospatial con-

tent by adopting an end-to-end approach for geospatial imagery, from acquiring proprietary high-resolution images through satellite and aerial network, to integrating and distributing that data through proprietary web-based search and retrieval system that makes it easy to find, purchase and download global imagery.

Oracle and DigitalGlobe to offer satellite imagery

USA: Oracle and DigitalGlobe will offer satellite

imagery to Oracle Database 11g customers. Via Oracle Spatial, DigitalGlobe will provide real-time access to its extensive image library for applications such as logistics, supply chain, mobile field services, business intelligence and asset management.

With the release of Oracle Database 11g, DigitalGlobe allows advanced access to sample imagery data via OTN enabling Oracle customers to test-drive imagery in their business applications before making a purchase decision.

Nokia to acquire NAVTEQ



Nokia and NAVTEQ announced a definitive agreement for Nokia to acquire NAVTEQ. Under the terms of the agreement, Nokia will pay \$78 in cash for each share of NAVTEQ including outstanding options for an aggregate purchase price of approximately \$8.1 billion (5.7 billion), or approxi-

mately \$7.7 billion (5.4 billion) net of NAVTEQ existing cash balance. The acquisition has been approved by the board of directors of each company and is subject to customary closing conditions including regulatory approvals and NAVTEQ shareholders' approval.

NAVTEQ will continue to provide the most advanced and flexible map data platform to navigation industry players. With NAVTEQ, Nokia will further strengthen its location based services offering and bring to market the most innovative, context aware Nokia Internet services with accelerated time to market.

"Location based services are one of the cornerstones of Nokia's Internet services strategy. The acquisition of NAVTEQ is another step toward Nokia becoming a leading player in this space," said Olli-Pekka Kallasvuo, President and CEO, Nokia.

The acquisition is expected to close in the first quarter of 2008. Nokia plans to finance the acquisition with a combination of cash and debt, and has secured a commitment on the debt. Nokia anticipates that the acquisition would not impact its share buy-backs under the current mandate, or its future cash distribution strategy in terms of dividends and share buybacks which is subject to the shareholders' approval. The acquisition is expected to be dilutive to Nokia earnings in 2008 and 2009 on a reported basis. However on a cash basis Nokia expects it to be only slightly dilutive in 2008 and slightly accretive in 2009.

Garmin Mobile™ XT: Plug 'N Play Maps for Your Phone

Garmin International Inc., announced Garmin Mobile XT an all-in-one software solution that turns select smartphones with internal GPS into high-end Garmin navigators. This mobile phone software application seamlessly pairs the phone's built-in GPS with Garmin's software so that customers have the benefits of navigation anywhere in North America or Europe. Unlike other mobile phone applications, Garmin Mobile XT offers convenient preloaded

maps and includes access to dynamic content like premium real-time traffic alerts and fuel prices, but does not require any monthly fees or subscriptions of any kind.

Garmin Mobile XT is preloaded on a microSD card that includes Garmin navigation software for the United States, Canada and Puerto Rico, or Europe.

Broadcom Unveils Single-Chip GPS Receiver

Semiconductor chip maker Broadcom Corp. announced its single-chip GPS product, coming on

the heels of its acquisition and integration of GPS receiver manufacturer Global Locate. The Broadcom BCM4750 is produced with low-cost 90nm CMOS chip fabrication process; the single-die (chip) product takes up less than 35 square millimeters of circuit-board space, according to Broadcom. The receiver makes full use of the Global Locate architecture. It also consumes less than 15mW while navigating with one-second map updates, which is less than half the power of competitive products, says Broadcom, citing published data

sheets. The BCM4750 is ideally suited for PNDs where rapid time-to-first-fix and superior navigation performance are required, Broadcom says.

The BCM4750 also takes advantage of Broadcom's telecom expertise; it includes software that is optimized for cellular integration and international standards - 3GPP and SUPL.

Hexagon to Acquire NovAtel for \$390M

NovAtel Inc. and Hexagon AB have entered into a definitive agreement under which the Swedish company will acquire all

the outstanding shares of NovAtel for \$50 per share, or approximately \$390 million. Under the terms of the agreement, Hexagon will commence a cash tender offer to acquire all of the issued and outstanding shares of NovAtel. The \$50 share price represents a 31 percent premium to NovAtel's 30-day volume weighted average share price, according to the companies.

Hexagon will also acquire NovAtel shares and a debenture convertible into NovAtel shares totaling 19.9% of the issued and outstanding shares of NovAtel in a private placement transaction at a purchase price of \$50 per share, the companies said.

GPS Satellite IIR-17M Launched Successfully

The latest GPS Block IIR satellite, designated GPS IIR-17M, lifted off successfully from Cape Canaveral Air Force Station in Florida aboard a United Launch Alliance (ULA) Delta II launch vehicle. Following a nominal flight of 1 hour and 8 minutes, the rocket deployed the spacecraft successfully, ULA reported. Designed and built by Lockheed Martin, the satellite is the fourth in a series of eight planned Block IIR-M spacecraft. The Block IIR-M series includes new features designed to enhance

operations and navigation signal performance for both military and civilian GPS users.

White House Agrees to Remove Selective Availability

The White House said that President Bush has accepted the recommendation of the Department of Defense to end procurement of GPS satellites that have the capability to intentionally degrade the accuracy of civil signals. This decision reflects the United States strong commitment to users of GPS that this free global utility can be counted on to support peaceful civil activities around the world. This degradation capability, known as Selective Availability (SA), will no longer be present in GPS III satellites.

GPS Ground Control Transition a Success, says USAF

The U.S. Air Force said that it had completed the physical transition involved in the Architecture Evolution Plan (AEP), its transition of the GPS ground control to a modern, server-based system. The modern AEP system replaces a 1970s-era mainframe computer that had been used as the primary ground control system for monitoring and maintaining the GPS satellite constellation. The new

ground control system is part of an overall modernization plan to improve operations, sustainment and overall GPS service, the Air Force says. The system enables upgrades for controlling the new GPS Block IIF satellites.

In the future AEP will also provide a new security architecture supporting troops fighting the global war on terrorism.

NovAtel Inc. Achieves Galileo Full Contract Award Program Milestone

NovAtel Inc., a positioning technology company, has achieved a Galileo program milestone through the award of a contract worth

US\$8.6M by Thales Alenia Space Italia for the continued development of the Ground Reception Chain reference receiver for Galileo, Europe's state-of-the-art GNSS. TAS-I, NovAtel and Space Engineering were initially selected by the European Space Agency /ESNIS/Thales Alenia Space France and began work on the program in June 2005. Since then, NovAtel has been developing technology under preliminary authorizations and has already generated US\$2.7 million in revenue between Q3 2005 and Q2 2007. The contract award is a program milestone achievement worth US\$600 thousand.

TomTom Launches One XL-S PND

TomTom is launching the One XL-S navigation device in the U.S. and Canada. It is the first product in the company's One XL range to offer spoken street names in addition to verbal navigation directions. The One XL-S also features the XL's 4.3-inch screen, as well as TomTom's Map Share technology and its Help Me! feature. Map Share is a proprietary map improvement technology that enables users to share map updates and corrections via TomTom Home, TomTom's free desktop software application. Map Share users can also respond in real time to changes in the road network and, with just a few taps on their PND screen, can correct the maps on their device accordingly, TomTom says. The Help Me! feature is a



menu that includes information about the nearest car repair service center, police station, or hospital, and allows users to either locate or call the closest emergency service provider no matter where they are, according to the company. It also allows users to quickly identify their location to share with emergency assistance providers.



Incorporating Geospatial Information into Business Systems

Increasingly, geospatial information is being used to drive decisions in large organizations. In the past, geospatial technology companies focused on developing and providing solutions to data providers, geospatial service providers, airborne sensing organizations, national mapping agencies, state mapping agencies, DoD/National Programs and the natural resources sector. However, as geospatial technology capabilities have increased, more organizations outside this traditional geospatial customer base are discovering the offerings, with increasing interest in integrating this technology into their organization's existing enterprise resource planning system.

Rather than understanding the vast array of remote sensing, GIS, photogrammetry, or other related geospatial offerings, these new geospatial customers speak only in terms of their business need, requiring a solution that operates and integrates with their existing software applications. For these new geospatial customers, it is vital that geospatial technology providers adequately understand their requirements, matching these needs appropriately. The geospatial tools must also meet the organization's existing security and sharing specifications.

Some of these non-traditional customers and their needs are listed in the chart (Fig. 1) on the following page.

Incorporating geospatial information into the large quantities of existing data these new, non-traditional geospatial customers maintain, adds immense value. Maturing standards and improvements in web services, data compression, metadata standards, delivery and processing power are bringing geospatial data exploitation to the enterprise, making this technology readily available to non-traditional geospatial businesses. Organizations integrating geospatial technology are more equipped to manage their data and storage, with new tools to automate, extract, collaborate and share information.

Previously, geospatial technologies operated in the desktop environment, or via web applications detached from other vital software packages. Without interoperability, geospatial technology remained separate from other integral applications, including those associated with an organization's manufacturing, supply chain, financial, human resources and customer resource management systems. Separated from geospatial applications,

Customer	An Example Need
Urban Planners	Monitoring green space
Real Estate Companies	Finding the nearest schools to a house
Environmental Consulting Firms	Evaluating the effects of residential development on a river channel
Civil Engineering Companies	Viewing a “before and after” highway project
Oil/Gas Companies	Monitoring the effects of ice sheet movements on pipelines
Insurance Companies	Assessing flooding on a residential neighborhood
Forestry Companies	Determining the financial potential of a forest stand
Land Developers	Calculating the value of a parcel of land
Tax Assessors	Estimating the effects of zoning changes on storm water infrastructure
E911	Ascertaining an appropriate place to land a helicopter
Command Control	Understanding the terrain in an area

Fig. 1 Non-traditional geospatial customers and their needs

data spread throughout an organization could not be adequately analyzed and fully transformed into the most comprehensive and understandable information. However, recent innovations and Service Oriented Architecture (SOA) developments have introduced a growing number of interoperable, platform agnostic geospatial solutions. These technological advancements allow an organization to maximize the effectiveness of their existing business system.

Business Needs

Integrating geospatial and location-based information into an organization's existing business system provides greater understanding and management capabilities. Because the geospatial ingredient is interoperable with the organization's current system, it not only provides powerful tools, but also quickly increases ROI. Adding the vital geospatial component to business information addresses the following universal business problems:

- **Change:** How current is the location-based content in the business system?
- **Quality:** How accurate is the information and content in the business system?
- **Social Networking:** Is it easy for employees scattered around the world to find, access and retrieve information from the business system?
- **Delivery:** How long is the wait for a request to receive an information product for a given area of interest?
- **Security:** Can the business system be secured to ensure reliable content and prevent corruption of business critical information?

Business Solutions

An integrated geospatial business system provides the following important capabilities, fully responding to an organization's needs, thereby adding value to the decision-making processes:

- **Change:** Authoring and maintaining fresh up-to-date content that can be used as the source for creating information products
- **Quality:** Creating accurate and precise data and web service solutions
- **Social Networking:** Dynamically connecting users to one another inside an organization while also connecting organizations to one another (B2B)
- **Delivery:** Rapidly delivering the right content and online services in an IT and Open Geospatial Consortium (OGC) compliant manner
- **Security:** Preserving the investment organizations have made in their source content by providing secure business systems

Adding the Geospatial Value

A geospatial business system meets the full spectrum of an organization's requirements, transforming geospatial data into information useful for decision-making processes. The specific components and capabilities built into geospatial business systems include:

- **Authoring** – Transforming source data into products, including orthos, terrain, features, 3D data, land cover data and processing models
- **Managing** – Finding, describing, cataloging and publishing data and web services
- **Connecting** – Linking users within an organization, allowing the rapid sharing of content throughout the organization or business to business (B2B)
- **Serving** – Subscription, mobile and web services which contain value added content delivered to a variety of domain specific and business applications

By incorporating geospatial technology into an existing business system, vast quantities of data become useable information, fully equipped to serve an organization cross-departmentally and in the B2B context. The enterprise is fully utilized, thereby maximizing an organization's potential.



Geospatial information integrates with an organization's existing enterprise resource planning system.

The future for the geospatial industry and for successful organizations is the geospatial business system – empowering the existing business system's structure by integrating existing and emerging geospatial and location-based technology to provide information throughout the enterprise.

Leica Geosystems Powers Business Solutions

Leica Geosystems Geospatial Imaging offers a broad range of geospatial information technology, delivering the most comprehensive solutions in image exploitation, geo-processing, visualization and data management. Organizations use this information for decision-making processes throughout the enterprise via web-based, mobile and desktop clients.

With Open Geospatial Consortium (OGC) and International Organization for Standardization (ISO) interoperability, Leica Geosystems develops solutions with the most advanced service-oriented platform available. These solutions empower users, making systems more flexible and accessible, therefore driving ROI for the enterprise.

The expert in geospatial imaging, Leica Geosystems facilitates the efficient capture of data, referencing of imagery, measurement and analysis of 3D referenced information. Providing robust image compression techniques, Leica Geosystems offers the most efficient delivery of imagery over the Internet or inside an organization.

(continued on pg 40)

Organizations using Geospatial Solutions Today

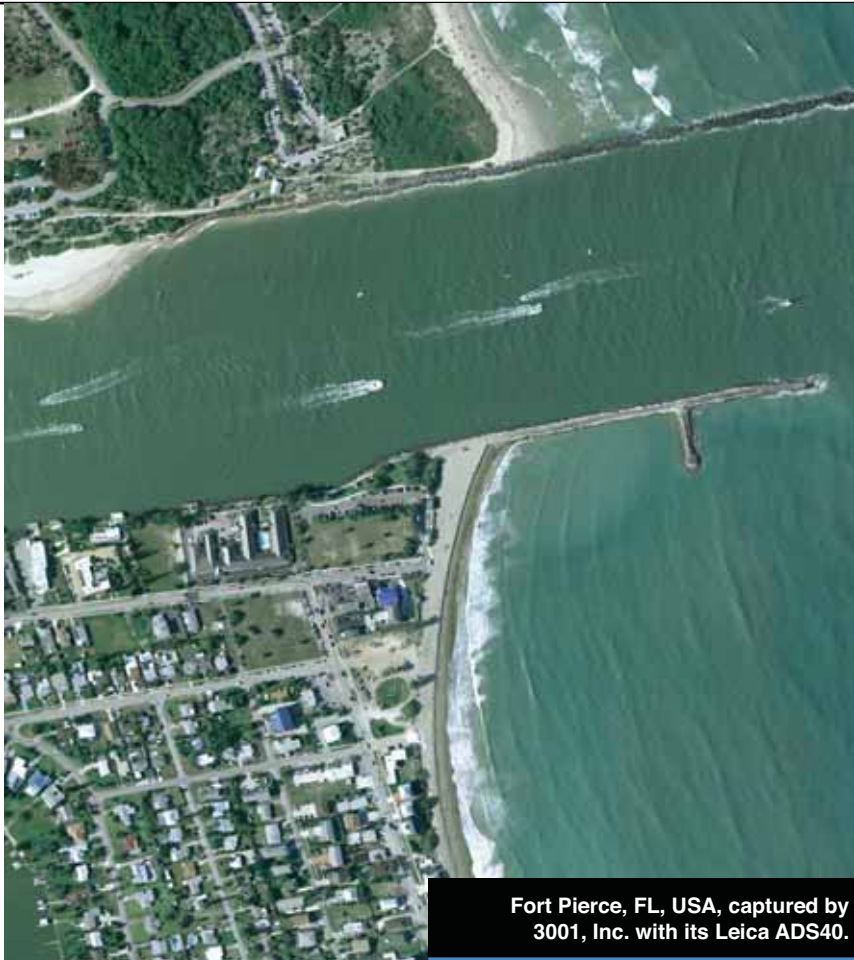
- Recently, the **State of Oregon** realized the need for a more efficient distribution mechanism, where users acquire digital datasets via a Web-based library/portal system. By combining **Image Web Server (IWS)** with other associated technologies (including **Image Integration Framework**), the state of Oregon implemented an efficient imagery distribution/provisioning web portal. IWS allows the storage of terabytes of data that can be served to web clients.

- The **Hurricane Katrina relief effort** required a solution to serve imagery of the changing landscape through Open Geospatial Consortium (OGC) interfaces. By implementing **RedSpider Image Archive**, commercial imagery, coordinated with the US Government, was served through standard OGC interfaces and viewed through various clients, including Microsoft and Google.

- Recently developing one of the transportation industry's first WiFi-enabled mobile asset management systems, **Florida Turnpike Enterprise** is now able to dynamically collect and readily access asset and geospatial information in the field. By implementing **Leica ADE** to enhance this system, Florida Turnpike has eliminated the need to post-process geospatial information. Built upon Oracle Spatial, Leica ADE provides swift and accurate information on the exiting sign inventory, assuring a timely restoration of signage after inclement weather.

- Recently, **National Zoo** staff traveled to China to train those working in panda reserves and forestry departments as well as researchers from science academies and universities. Utilizing **ERDAS IMAGINE**, the students now perform unsupervised land-cover classifications and habitat analysis. Sharing this knowledge and tool brings a wider understanding of panda conservation and challenges in terms of habitat loss and infringement.

- With high-resolution digital scans, scientists hoped to increase research efforts and public access to the original Apollo mission flight film negatives. Collaborating with **NASA** and **Arizona State University**, this team identified the **DSW700 Photogrammetric Scanner** as the most appropriate scanning solution, increasing its normal 12-bit scan to 14-bit. This was necessary because of the Moon's vast contrast, enhanced by the original film that captured the wide range of grey scale variation. The scanning continues, and with these images, ASU has launched a full map of the Moon (<http://apollo.sese.asu.edu/>).



Fort Pierce, FL, USA, captured by 3001, Inc. with its Leica ADS40.



Leica TITAN

Empowered by a 3D virtual globe, Leica TITAN is a dynamic online solution allowing users and communities to share geospatial data, web services and location-based content in a single, secure environment. With intuitive 3D navigation tools, users can share imagery, terrain, 3D models, and feature data sets while retaining digital ownership rights. Using the free web-enabled Leica TITAN client a global network of users interact, download, and share data. Users create a MyWorld, a geographically enabled personal space to upload their data, set permissions, and share content with other users in the network. The Geospatial Instant Messenger provides a powerful communication tool for users to chat within the network.



View of Wallensee, Australia in TITAN

(continued from pg 39)

Recently, Leica Geosystems acquired the technology of Acquis and ER Mapper and IONIC. Each of these strategic acquisitions provides the company with new technology and clearly strengthens our global presence.

The Acquis ADE suite, now called Leica ADE, supports multi-tier editing of Oracle Spatial, topology and attribute data stored in an Oracle Spatial database, via web-based, mobile and desktop clients. The Acquis acquisition also brings expertise in Oracle Spatial data management, solution design and implementation services.

ER Mapper's technology further enhances our enterprise image delivery capabilities, providing geospatial image processing tools for preparing, managing, compressing, and deploying imagery, thereby complementing our existing product portfolio and technological strengths. ER Mapper's enterprise solutions enable the rapid delivery of imagery over the internet or inside an organization.

IONIC offers enterprise geospatial technology with the most advanced service-oriented platform available for web-based and distributed systems. Further enhancing our data management capabilities, the Red-Spider suite of products offer a seamless interoperable spatial data infrastructure to securely discover, catalog and serve geospatial information over the internet.

With a rich history, Leica Geosystems continues to lead the industry, meeting customers' needs in today's enterprise environment. Those who use Leica Geosystems products every day trust them for their precision, seamless integration, interoperability and superior customer support. Geospatial solutions from Leica Geosystems - when it has to be right.

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- when it has to be **right**

Leica
Geosystems

Business GIS

North Arizona University (College of Business Administration) has started MBA in GIS. At University of Redlands, School of Business, students can customise their MBA by electing an 'Emphasis' in Geographic Information Systems (GIS); Finance, Global business and Information systems being the other three.

UK's Coventry University too has MBA in GIS! Geotechnologies are moving to business, read retail and marketing. GIS is taking roles beyond its traditional use by public and related government agencies to businesses analyses that enable movements in the marketplace.

It was couple of years back that Levi Strauss, North America was on the look out for a cost-effective solution to manage the growth and approval of new authorised retailer locations. It wanted a tool that would geographically display its existing authorised retailers, potential retailers, and the customers the distributors serve. This objective was to ensure that new stores do not impact the sales of existing stores adversely. The company's Sales Center started using BusinessAnalyst of ESRI. The solution streamlined its review process of new retailer applications that allows it to see prospects geographically in relation to existing stores. It reduced onsite visits to new retailers, accurately modeled locations of existing and potential retailers and provided quick analysis that was repeatable with same evaluation criteria for each prospect.

Geomarketing, which in simpler terms means marketing analysis using geolocation (geographic information), also includes physical analysis of sales

and service issues. It is about bringing maps together with critical data on customers to gain better insight on how and whom to target the marketing efforts. Starting from the background of various research and application fields, such as geology, economic geography, urban planning and environmental technology, GIS has evolved continuously and achieved a high level of maturity. The movement to business might be attributed to the pushed-up business scenario world-wide (consumerism) as a result of globalisation and opening up of economies. With the terms "sales-engineering" and "market analyses" coming on the centre-stage, businesses are vying for solutions to get the two working for profits. Added to this the fact that 80% of the data that an organisation uses has spatial component, GIS have its wider role cut out. As opined by 64% of the business executives, as part of an international survey, Location Intelligence, which may be taken as the subset of Geomarketing, largely improves business processes. The survey carried out last year by the then MapInfo in collaboration with Businessweek Research Services also mentions that a 3rd of these executives have GIS-based solutions in the pipeline. It is also



GIS@market

interesting to note one more result of a survey that says more and more GIS players are now moving to develop location-based services and applications.

Map-overlays enable market and company-specific data visualized and structured that thus can be directly related to the tasks of sales and marketing, further enabling their optimization (Geo-optimisation; see box). A reliable and updated data handled by means of GIS massively supports the entire sales process. This in turn guarantees improved customer orientation and productivity.

Typically, Business GIS (term used interchangeably with Geo-marketing) in sales and marketing process leads to study and analysis of

- i) Geography - topography, infrastructure, economy, culture - at local, regional and global level
- ii) Market factors - Offering answers to where can I find more of my best customers; Where are competitors impact-

ing my business? Where is my newest product or service most valuable? The decision support is offered while going for new locations and distribution points.

iii) internal corporate factors, such as the location of production plants, purchasing and delivery stores and branches

An interactive thematic map application presents geographic sales and marketing data that proves useful in many situations, as: i) comparison of sales to historical results or to budgeted plan by geographical area ii) regional/geographical comparison of market share and price point data relative to the products of competitors, iii) evaluation of the influence on local sales of regionally targeted advertising or promotional campaigns, iv) comparison of the effectiveness of sales person calling efforts by geographical area, and v) quick preparation of exhibits to present financial performance in a map format. A GIS solution can be linked to a marketing organization's ERP/ accounting system so that GIS reports for marketing analysis can be generated as automatically.

(www.tatukgis.com/products/custom/custom.aspx)

@RETAIL BUSINESS

The scope and ease of addressing the fourth 'P' (Place with 'Product', 'Price' and 'Promotion') of Marketing has widened. Thanks to what is known as GIS-based locational decision-making in retailing. There are multiple areas in retailing that await location establishment before being worked out. The major location decisions in retail companies (Hernández et al., 1998) are cited as six R's.

a) Roll-out - Increasing floorspace in existing store or opening a new store b) Relocation - Moving to a new site due to close proximity of two stores, or availability of a new retail pitch c) Rationalisation - Closure of individual stores, or selling of divisions d) Refascia - Altering image of outlets by changing their name/appearance e) Refurbishment - Updating fittings f) Remerchandising Altering product range of a retail location, tailoring offer to the local consumer

A further focus of GI-related research in retailing and services has been geodemographics, which are 'the analysis of social and economic data in a geographical context for commercial purposes related to marketing, site selec-

tion, advertising, and sales forecasting' (Goodchild, 2000).

ESRI's ArcGIS Business Analyst comes with readymade tools that easily are utilizable in retail operations' analyses. On top of that it includes an extensive library of data from industry leading data providers and an optional of Segmentation Module for customers' analysis.

Tactician (of US) too offers a series of products exclusively available for retail business. Company's Tactician One is multi-dimensional data structure designed to manage marketing geometry that facilitates creation of retail trade areas and territory structures without programming. This approach eliminates cost, time and maintenance. Other utilizable products are Online Demographic Reporter Plus and Site Manager (on consumer expenditure, wealth and lifestyle analyses). The latest of the offerings is the Strategy Map. Similarly, there are other suppliers of location optimization business systems that promise to provide tools that increase 'return-on-invested-capital (ROIC)'. Few of the available software are listed in the adjacent box.

It is important to note that the exhaustive census data has been made use of along with the base map. Vendors too provide this along with their product suites. ESRI Business Information Solutions (ESRI BIS), the component of Business Analyst, offers more than 1,000 variables, including 2008 projections, population by occupation /industry; disposable income; consumer expenditures by state, county, ZIP Code, tract, and block group level; and, at the census tract level, ACORN market segmentation data.

Loyalty card schemes have risen in prominence in the last few years. Customer sales' data are generated that

Geo-optimisation

Geo-optimisation is the combined use of geographic information and optimization algorithms to enhance organization's and companies' efficiency

Various kinds of activities can take advantage of geo-optimisation

- marketing analyses (geomarketing): optimise your sales outlet location, your canvassing methods, your direct marketing actions (i.e. sending leaflets without addresses), division into sales sector
- logistics optimization: rounds, delivery, collection, carriage (materials, parcels)
- sales forces optimisation : customer appointments, prospecting rounds, business trips
- mobile technicians optimisation: maintenance rounds, after-sales appointment, installation jobs

(<http://www.geoconcept.com/?574/Geooptimisation>)

can be referenced to the individual cardholder's address thus obtaining 'geographic information'.

As part of retail operations, RFID (Radio Frequency Identification) enables a great variety of data extracts and information views. With information views coming from desktop to more compact platforms (mobile, PDA, BlackBerry) and more of these through wireless media, new thinking is required on how to process data in ways that provide end users with key information in a readily useable format but without filtering that data excessively. For location data, geographical information systems (GIS) can play an important role in graphically depicting a great deal of information in a very concise manner. In an integration of RFID+GPS+GIS, RFID is used to provide unique identification of an object, GPS provides the latitude & longitude (location coordinates) and GIS system provides the real time online asset information on the web to end users. The forward and backward linkages of retail have been geo-optimised, as a result of GIS applications.

@BUSINESS SCHOOL

GeoWharton is the name given to The Wharton School GIS Lab and The Wharton GeoSpatial Initiative. Incepted in 1997, as part of the Wharton Business School GeoWharton research area is "spatial econometrics" backed with strength and flexibility of GIS technology. Its current research projects include: modeling the site selection process for retail firms, examining geospatial risk in mortgage lending, developing valuation models for residential real estate, analyzing impacts of neighborhood investment strategies on property values, etc. Though no formal course is offered by the School, its

Business GIS software

ArcGIS Business Analyst

ESRI

Major functions are -
a) Perform customer or store prospecting. b) Define customer-based or store trade areas. c) Find a location similar to that of your best store. d) Conduct market penetration analyses. e) Create gravity models to forecast potential sales at new stores. f) Perform drive-time analysis over a nationwide street network. g) Search national businesses and add results to an analysis. h) Integrate data and geography from the Web.

www.esri.com

Envinsa

Pitney Bowes (PB) MapInfo Corp.

Envinsa is a set of distributed Web Services, geographic data and management utilities that adds location analysis and geographic visualisation capabilities to analytical and operational applications. Common applications include dealer locators, find-the-nearest applications, contingency planning, asset management, risk management, customer support and marketing analysis. PB MapInfo also has AnySite, PSYTE, SmartSite Solutions and TargetPro that are especially business development solutions.

www.envinsa.com

SimplyMap Geographic Research, Inc.

This web-based mapping application lets users to create professional-quality thematic maps and reports

using demographic, business, and marketing data.

Users can:

a) Access thousands of demographic, business, and marketing data variables. b) Develop interactive thematic maps and export high-resolution images to word processing or presentation software. c) Select, sort, and compare data across multiple locations and build custom reports that can be exported to a spreadsheet for additional functionality. d) Explore historical census data to understand how regions change over time and use estimates and projections to analyze current and future trends.

www.geographicresearch.com

Maptitude

Caliper Corp.

With Maptitude user can find locations with desirable characteristics before renting marketing lists, buying advertising time, or planning new facilities. The tools enable to -

- Customise message to a target audience: Pinpoint the ZIP Codes or telephone exchanges that are within sales area and that have desirable demographic characteristics - a feature that enables planning mail or phone campaign Maptitude allows map creation using one's own data besides enabling establishment of customers' location and building sales territories. 'Mapitude for the Web' is a specialised version of Maptitude that has special capabilities for designing and running interactive map applications and location-based services on the World Wide Web.

www.caliper.com/Mapitude

XMap 5.2 Professional

Delorme

It comes with professional mapping and GIS Viewing tools that are easy-to-use for mobile field forces. It has business mapping and GPS navigation tools. It is used in conjunction with XMap GIS Enterprise to support field data collection and GIS database management.

www.shop.delorme.com

InsMap

HDM

HDM's Business Products Division provides geospatial software products targeted at the mortgage and insurance markets.

With InsMap, the user will know what properties in their business portfolio have experienced a potentially damaging event.

The user will have data for projecting claim volume, type and severity by location and able to validate claims based on actual conditions.

www.hdm.com/insmap

A3D Scheduler Client

Anything3D.com

Main features of this Windows-based software are -

a) Complete information on personnel, customers and orders. b) All advantages of the Drag & Drop technology. c) Optimisation of schedules using various criteria. d) Viewing of scaled maps. e) Calculation of optimal routes and viewing it in a graphical as well as text format. f) A Printable reporting system.

www.gis.anything3d.com

As happens with most of the disciplines and technologies, the widened scope of their applications in industry leads the way to demand for specialised skills

business partner programmes give students insights to business GIS. Students work out tools that include GIS while they research on different business aspects and use GeoWharton lab.

Apart from the earlier-mentioned option of selecting GIS as Emphasis during the MBA regular course, Redlands business school offers GIS certificate course. Major topics include - (a) Market segmentation and target marketing using GIS as a decision making tool, (b) GIS assessment for entering international markets and global sourcing, and (c) Effective strategic management using geographic information and GIS.

The Department of Geography at University of Wisconsin, Eau Claire offers an emphasis on Urban Economics and uses GIS business applications in the programme. The department also works with the School of Business to integrate GIS into business course work when possible.

The other two institutions that feature in ESRI's "Approaches to School of Business GIS Programs" are West Chester University, Pennsylvania and Nova Scotia Community College, Centre of Geographic Sciences.

In UK, School of Geography of University of Leeds, offers MSc / Diploma in

GIS for Business and Service Planning. Key features of the course include the focus on geodemographics, retail decision support systems and a work placement in a GIS or business organisation. The fast application of business GIS may not be reflected in the ways the business colleges have started including it in their course structures but the gradual change is very much evident. As happens with most of the disciplines and technologies, the widened scope of application in industry leads the way to demand for specialised skills and thence the initiatives as given above.

@INDIA

Opportunities for growth of business GIS may very well be speculated with the entry of retail sectors in the country. 'Business' is becoming the buzzword. The comments at a GIS blog site may be cited

"Next couple of years will witness a sea change in use of RFID and GIS technology. Some people have understood it pretty well. Some people still haven't. An organisation which has a healthy mix of these two practices will see rapid growth in the years to come.

With Wal-Mart striking a deal to enter Indian retail, the industry as a whole is going to witness use of more technology. The first thing that comes to mind is use of RFID. ...And the next big thing that will be in focus for next couple of years will be GIS."

For now the applications are limited. Companies have gone for pilot studies but the implementation still falters. Availability of the base data seems a major blockade. With no open policy of data generation and sharing, this spin off application of GIS might yet take time. For now the issues that are of concern are a) non-exhaustive census

data and (b) Cost at which the base data is available. A simple vector village boundary (Survey of India) database (single user, unverified on ground) costs INR 1,650 per district, which comes to around INR 10,00,000 (USD 25000) for the whole country, taking 600 districts in India. The same costs thrice when for multiple user. But there are examples where industry players have found ways to come out of the situation. After developing proprietary surrogate datasets and using them with the available government data, Pacific GeoPRO of Taiwan has been providing its clients 'granular data' viewing abilities to business developers.

Penetration of GIS application in business seems taking place at the curriculum front also. A recently received query at GIS Institute (Training division of GIS Development Pvt Ltd., the publisher of this publication) from a management institution for conduction of short terms GIS course tells the story.

@LAST

Sales and marketing, when strategized geographically, have shown to yield results. On the other hand, direct proportionality between business GIS and growing market economies is naturally understandable. And naturally too, the Asian scenario of this GIS application will too grow the way the other socio-economics of the region have grown. But surely, it is time for the Asian geospatial industry to gear up. A compulsory background of GIS as eligibility for a sales job, should what the industry be rightly hope for! ■

Saurabh Mishra
Assistant Editor, GIS Development
saurabh.mishra@GISdevelopment.net



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Small satellite constellation allow greater understanding of space

Q. Your group's research interests turned out to be a successful business model, leading SSTL's inception. How did this transformation come about?

Although SSTL was founded as a commercial company 22 years ago, it all began in 1979, when micro electronics was enabling technology. A group of young researchers and radio enthusiasts started developing satellites with high capabilities but at low cost and with small mass. At that time satellites were getting larger and more expensive

and it seemed that there was an opportunity to reverse the trend by using micro electronics, building smaller satellites that would be accessible and affordable by universities, research organisations and developing countries whose governments aspired to a space programme.

Q. What were the early challenges?

The financial challenges in the beginning were quite severe, mainly because we had no money and started with only 100 pounds! We received a lot

of support from industry and once the company was formed we began working with some developing countries, including Korea, Malaysia and Singapore, who were interested in having access to this technique and technology. These partnerships evolved over a period of time and that allowed us to generate revenues and then slowly build up the company. The company grew organically and consequently slowly. It took almost 10 years to reach a position where we could employ 25-30 people and begin reinvesting the profits year by year. We never went out to find venture capital or any other type of investment, but little by little, SSTL began to grow as a commercial player in the small satellite marketplace.

Technology and Evolution

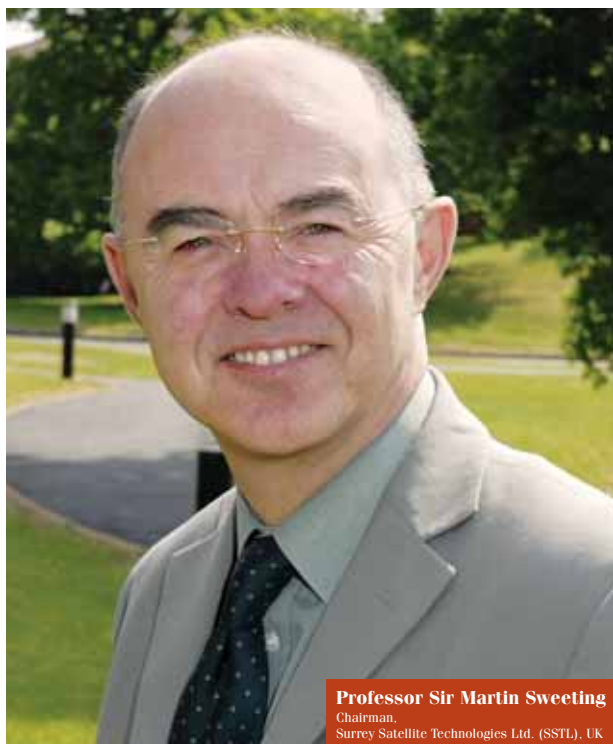
Q. What were the strategies in further strengthening of the technology?

We developed a "know-how" transfer and training program, with a number of countries as the main point for our early work and as the core part of our activity. SSTL worked with engineers from these countries, helping them to develop their own spacecraft and to acquire technology know-how using commercial off the shelf

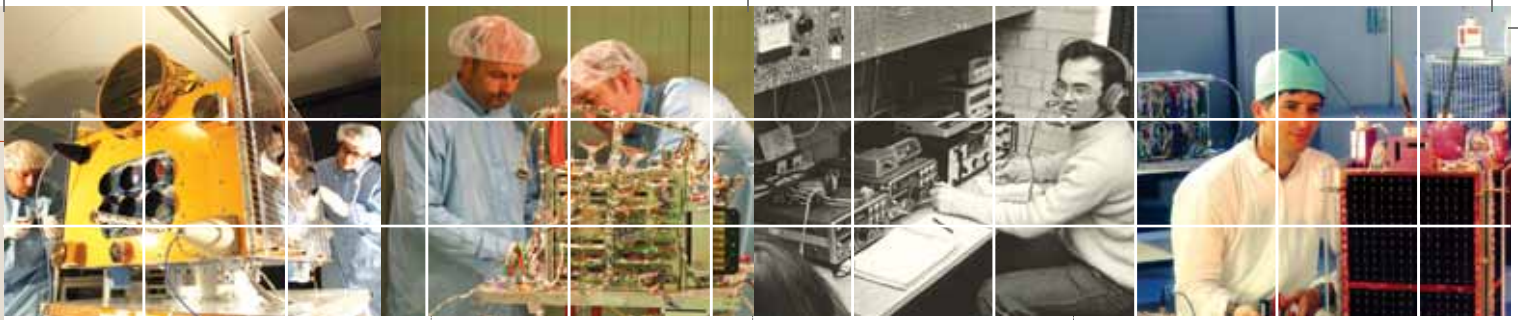
technologies. By the late 1990's we had also built a number of spacecraft for the French Ministry of Defence and the US Air Force. In 2000, the application of these small satellites in the Earth Observation (EO) sector started to become very apparent. We began building the now operational Disaster Monitoring Constellation (DMC) and, most recently, have built the first of the Galileo satellites for Europe. At present know-how transfer accounts for 60% of our business with 40% commercial missions and systems.

Q. What factors determined the development of GIOVE-A at SSTL?

The European Commission (EC) and the European Space Agency (ESA) realised in July 2003 that if they were not able to use the allotted frequency by June 2006, they would lose it. They were also concerned that the large satellite manufacturers could not meet their deadline. SSTL bid for and won the contract to build GIOVE-A, whilst a conventional industry consortium was awarded a parallel contract for GIOVE-B: The cost of SSTL's GIOVE-A proposal was approximately one-third of the cost of the European consortium submission. With just a 30-month sched-



Professor Sir Martin Sweeting
Chairman,
Surrey Satellite Technologies Ltd. (SSTL), UK



ule and a budget of less than 30 million Euros, SSTL completed the satellite on time, within budget. GIOVE-A was launched on December 28th 2005, remains operational and has been transmitting Galileo signals from space for over 18 months, enabling the ground equipment suppliers to develop their products. Because of the delays in GIOVE-B (the latest indications point to a launch early in 2008). SSTL was awarded a second satellite contract earlier this year by ESA for GIOVE-A2.

Away from GIOVE, SSTL believes it is essential to have some Galileo services available in a reasonable time-frame and is discussing its ideas for early services with ESA and the EC.

Q. How do you see the future prospect of Galileo?

The whole idea of what to do with the Galileo navigation system is under debate in view of the delays, the high costs proposed and the lack of competition. Consequently, there are now serious talks about what will happen. Personally, I think that Galileo is important for Europe and if done in the right way and with true competition, Europe can afford it. I believe that there's going to be some very serious thinking about the business case for constructing the Galileo system. It is essentially

a European political business decision to be taken with the EC. SSTL is very happy to help ESA and the EC by offering a lower cost and quicker route to implementing Galileo. So once the politics have been sorted out, we are here to help.

Q. What are the future prospects of the Disaster Monitoring Constellation (DMC)?

The first generation of the DMC satellites have been operating very successfully for over 3 years now and we are in the process of constructing the 2nd generation DMC. The Beijing-1 satellite launched 2 years ago is the forerunner of the second generation DMC satellites and has a 30 m Wide Area Multispectral (WAMS) imaging capability and a 4 m panchromatic camera to provide high resolution data. A new satellite for Nigeria will be launched within the next 18 months and this will also provide the 30 m WAMS data and 2.5 m panchromatic data. The future DMC satellites will increase the WAMS camera's spatial resolution from 30 to 22 m. The next constellation will therefore have increased resolution with medium resolution multispectral and high resolution panchromatic alongside. We are also talking to other countries about the possibility of joining the 2nd generation DMC. Apart from DMC, we

are also building three EO satellites for the Federal Space Agency of Russia which will be operating it as part of Russia's national activities. SSTL built the UK TopSat satellite, launched in 2005, which has 2.5 m panchromatic and 5 m multispectral imaging, providing high resolution image data for the UK government. TopSat has recently been brought in alongside the DMC satellites to provide high resolution data.

Exploring the Unknown

Q. Why did SSTL enter into space missions, Moon-Lite and Moonraker?

SSTL has actually been working in the background on these mission proposals for the last 10 years. We recognise that small satellites can help reduce the cost of exploration of the solar system and really help some of the countries interested in exploring outer space. We can provide a very useful supporting role to help reduce some of the cost and speed up the program through the use of small satellite technologies and techniques. The UK cannot fund large exploration projects alone - even the larger nations find it very difficult to fund these by themselves - and there is a role for smaller nations to contribute and provide specialist services. These nations might contribute to the level that is commensurate with their size, economy and

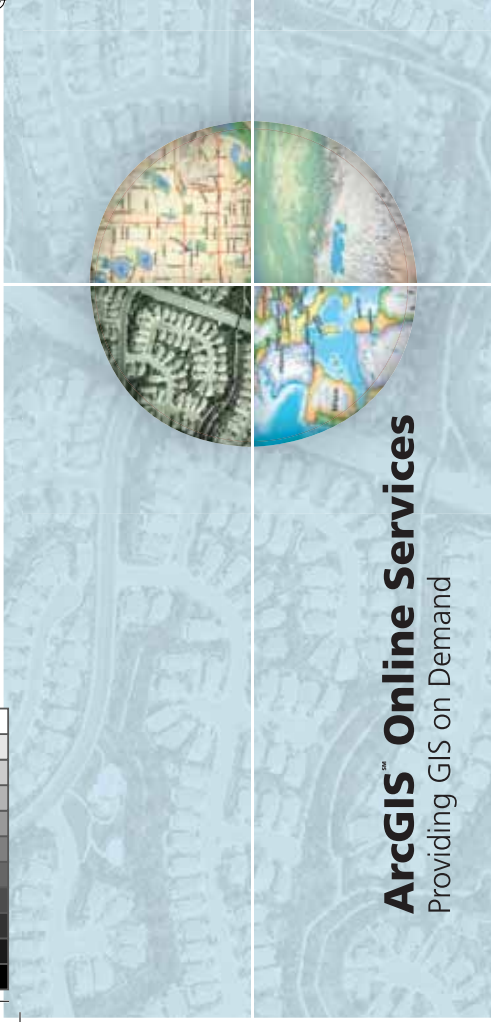
policies. The UK has specialist strengths in small satellites, robotics, communications and space science instrumentation - we can therefore contribute significantly to the overall international exploration effort through small national space missions addressing niche areas and applications.

Vision

Q. What according to you would 'govern' the future of space programmes in a global perspective?

Well, I have noticed over the last decade that space is becoming increasingly integrated into our everyday life. Globally space is becoming increasingly important and I think that we can see it continuing to give benefits in terms of climate change, environmental monitoring, resource management and particularly water management. And those are going to be some of the critical topics in the next decade. But I believe that we will also see satellites used increasingly and more widespread for security activities.

Looking to the future we will see more satellites carrying out a range of individual tasks but operating in networks, with a number of small satellite constellations. This will allow mankind to gain a greater understanding of space and the Earth.



ArcGIS™ Online Services

Providing GIS on Demand

By Jim Baumann, ESRI Staff Writer

ArcGIS® Online Services offer ESRI's ArcGIS user community a comprehensive collection of Web-based mapping services that can be immediately combined with a user's own data to provide the foundation for projects and enhance the quality and capabilities of the GIS.

These services provide access to ready-to-use content including 2D maps, 3D globes, reference layers, and tasks. ArcGIS Online is deeply integrated with ArcGIS and provides immediate access to cartographically designed, seamless basemaps and imagery that can be used with any ArcGIS® Desktop application including ArcGIS Explorer.

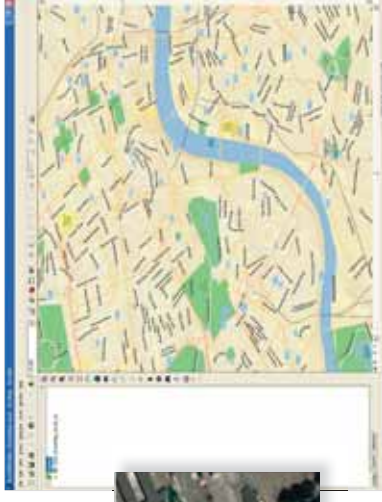
The cartographically designed maps and globes available through ArcGIS Online Services can be used to create custom maps by combining them with a user's own data or with services from a variety of sources including ArcGIS Server, ArcIMS®, Open Geospatial Consortium Web Map Service (WMS), and KML services.

Currently, the available data includes worldwide satellite imagery, a world street map, shaded relief and topographic maps, a natural earth physical map, and a political world map from National Geographic's *Atlas of the World*. ArcGIS

Online basemaps and reference layers are cartographically authored and support multiple-scale display. They are perfect for use as background or as overlay layers for locally created and maintained datasets.

Combining local data with ArcGIS Online Services enables the user to quickly and easily author maps for a variety of applications such as city planning, cadastral management, mineral exploration, environmental management, disease monitoring, and hydrography. These maps can be used to conduct visibility modeling, proximity searches, demographic analyses, asset management tasks, or situational awareness activities.

For example, a utility that is considering extending its service or merging with another provider could obtain street map data to provide context for the geographic analysis of its network outside its normal service area. Or a business considering target markets beyond its existing market area can get quick access to imagery and basemaps that provide neighborhood details. In these cases, ArcGIS Online provides an easy method to obtain the needed content quickly, without having to worry about data preparation or compatibility.



World imagery offers natural views of the earth at multiple resolutions.

Locate places and addresses and get driving directions with the World Street Map.



Historical World Map



Physical World Map



World Protected Areas Map



U.S. Topographic Map

ArcGIS Online Services offer many advantages to ArcGIS users. Because the content is prerendered, ready to use, and hosted by ESRI, users don't have to invest in additional hardware, staff, or training. This also frees users from data management and update activities and allows them to focus on their mission-critical work instead. ArcGIS Online is powered by ArcGIS Server and deeply integrated with ArcGIS software. Through specific resource centers, ArcGIS users can access the desired content and save it to their desktops.

ESRI updates the ArcGIS Online Services content frequently so that access to the most current data is always available.

Connect to ArcGIS Online Services Today

ArcGIS users can quickly get started by visiting the ArcGIS Online Resource Center at <http://arcgisonline.esri.com>, where they can register for the free beta program; access prepublished maps, globes, and reference layers; or browse the templates, user guides, tutorials, and metadata.

Or, request your ArcGIS Desktop evaluation at www.esri.com/desktopeval and explore ArcGIS Online.



Towards An Integrated GIS

The ability to provide a single 'window' to access and correlate valuable data residing in different systems can bring many benefits and further justify the efforts and costs invested in existing systems.

Such ability is easier to achieve today with the availability of some of the latest technologies, including broadband Internet and wireless technologies.

This paper describes SAJ Holdings' IT strategy goals to bring together spatial data and other non-spatial data from various computerised systems to improve its business processes. These include improved productivity (maximise utilisation) of assets, reduce and simplify tasks such as assets maintenance and pipe burst repairs, improve water quality control, improve customer services and emergency response time.

GIS PROJECT BACKGROUND

The implementation of SAJH-GIS, now called Integration GIS (IGIS) adopted a phase-wise implementation strategy where a pilot area was select for phase I implementation in 2002. This was followed by few other phases that focus on different components of the overall project. An important project component of the pilot project was a 30-days detailed user requirements study (URS) that investigated current and future GIS needs of SAJH, which helped formulated an effective implementation strategy to successfully integrate the water GIS to most of SAJH's computerised systems.

FORMATION OF GIS TEAM

In year 2000, a GIS team made up of four SAJH staff with different professional backgrounds from the Project Planning division was setup at SAJH HQ. It consisted of an assistance manager (Civil Engineer), an executive GIS (Geo-information degree), an executive Hydraulic (Civil Engineer) and a draftsman (Autocad operator). The close cooperation between all divisions i.e. Planning, Operation, Finance (which also includes IT department), and the GIS committee members at district level, made the development of Integrated GIS, a success.

An effort to compile as-built drawings, catchments area maps, schematic diagrams of distribution pipes, schematic diagram for District Meter Zones (DMZ), and other records of water assets was carried out by the team before awarding the project. This was to ensure that as much source documents required for data conversion would be ready on project start-up. The GIS Team responsibilities include:-

- Setting up the framework, appointing a professional advisor from local university - Faculty of Geoinformation Science, Universiti Teknologi Malaysia
- Software selection - Smallworld, an object-oriented GIS software was selected through series of benchmarking. Key features of the software include version management that supports true multi-users for updating the database, a seamless database that is suitable for storing network data, strong development tools such as Magik programming tool that supports rapid development, an integrated CASE tool for interactive data modeling, strong out-of-the box network analysis tools, easy file management (with less files layer) and good security features,

- Land database selection - Landbase data were purchased from the national survey and mapping agency (Jabatan Ukur dan Pemetaan Malaysia - JUPEM) mainly because it is the custodian of such data and the low cost of data,

- Vendor selection - Spatial - Data Enhancement Consultancy Sdn Bhd (S-DEC) was appointed to implement the proposed water GIS for SAJH in 2002.

PROJECT IMPLEMENTATION

The pilot area selected in 2002 was the city area, Majlis Bandaraya Johor Bahru (MBJB). The main focus of the pilot project was the User Requirements Study (URS), data conversion of landbase and water assets data in MBJB area, development of some customized applications and technology transfer programme. The URS were conducted at all levels of the departments in SAJH to ensure that requirements from all levels are fully understood.

Phase II of SAJH-GIS included data conversion for the whole state of Johore which consists of eight districts. A total of 9671.14 kilometers of pipelines, more than 900,000 land parcels and about 70,000 fittings were converted by the end of Phase II project. Few months after the consultant hand-

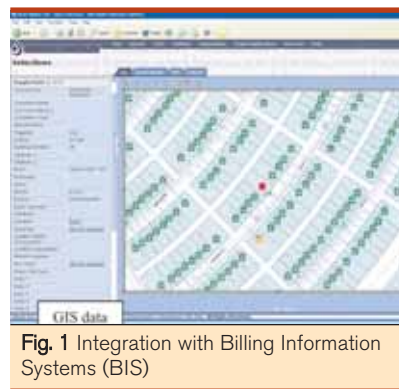


Fig. 1 Integration with Billing Information Systems (BIS)



ed over Phase II project to SAJH, SAJH GIS Team successfully updated the GIS database by capturing another 5428.86 kilometers of pipelines, along with 541 DMZ and other fitting objects. Most of the roads and major landmarks such as police stations, hospitals, and commercial buildings were also captured.

Site verifications were carried out using GPS surveys. A new application called Field Information System (FIS) has been implemented where any part of the GIS database may be extracted to mobile devices, along with customized functions (profiles) to further improve tasks such as assets maintenance and verifications of assets attributes. Updated attributes in the mobile devices, along with additional data captured can be automatically synchronized with the master database after the extracted databases are returned to the GIS server.

MOVING TOWARDS AN INTEGRATED GIS

On successful completion of phase II project at the end of 2004, SAJH embarked on its first Integrated GIS plan in January 2005, by appointing S-DEC to implement integration of SAJH-GIS with four other major computerized systems namely Billing Information System (BIS), Water Quality System (WaQIS), Production Control System (PCS) and Job Management System (JMS). PCS integration was later rescheduled to a later date.

In August 2006, the second integration project was awarded to add more sub-modules to the 2005 integration project and new integration to Remote Monitoring System (RMS) and PCS. In addition, an advanced tagging application to speed up the linking of customer records in BIS and SAJH-GIS, a Project Document Management System and a

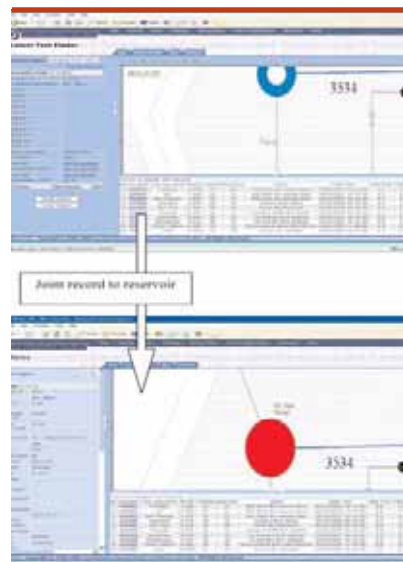


Fig. 2 Integration with WaQIS and Joint record to Reservoir (Storage)

Field Round Trip system were also developed.

With the above integrations, users can now easily produce customised



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Fig. 3 Integration with RMS (Trending Report) providing customized reports, maps & graphs.

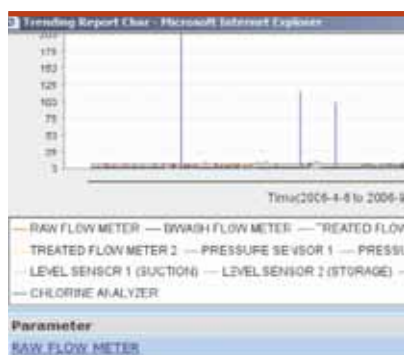


Fig. 4 Integration with RMS (Latest Info Report)

reports, with maps and charts, providing more informative information from various systems using Smallworld Internet Application Server (SIAS).

Using the Internet access, visitors could run these applications to access live data in the GIS production server located in Johor Bahru with good response times. For example, user can view information related to billing via a spatial query, provided the supply points are tagged to their corresponding customer records in BIS. Otherwise there are other types of customized applications for user to access and query directly BIS database to produce reports on billing and customer details via the integration.

Now our operational managers, network planners, and head of departments can access data in multiple systems using SIAS through intranet at head quarters as well as at districts.

INTEGRATION WITH BILLING INFORMATION SYSTEM (BIS)

Below are some of the sample results from some of the customised reports.

- Total number of consumptions and charges based on last reading within selected geometric area. Result by tariff number,
- List of meter type by DMZ Zone,
- List of customer data in multiple query selection. For. e.g list of properties with criteria: tariff = 1, and consumption $\geq 100 \text{ m}^3$.

INTEGRATION WITH WATER QUALITY SYSTEM (WAQIS)

The integration with WaQIS produces useful information to monitor the quality of water produced.

INTEGRATION WITH REMOTE MONITORING SYSTEM (RMS)

The integration with RMS consists of 3 main customised reporting tools namely Trending Report, Latest Information Report and Alert Report. The number of records in the external RMS exceeds 15 millions (parts of which are SMS records) and it was a challenging task to achieve acceptable response times for each of the queries.

TRENDING REPORT

Latest Information ReportThe Latest Information report shall produce information on three (3) types of assets namely water treatment plant, reservoir and booster pump house. It will:

- produce information on date/time, level (low and high) and status of reservoirs.
- produce information on date/time, levels, top water level, bottom water level and status of water treatment plants.
- produce information on date/time, flow, pressure, water quality, status of Booster Pump House

ALERT REPORT

The Alert Report shall allow query on the total number of alert for any period but up to 12 months. Users will be prompted to enter the start and end dates when after activating the report tool. This integration provides alerts on information such related to level, pH, flow rate, turbidity, chorine and colour.

HOW GIS BENEFITED HYDRAULIC MODELLING

The GIS and assets data can be easily exported based on a variety of conditions using a customized translator for use in hydraulic modeling software. SAJH and its associated company, Ranthill Water Services (RWS) are currently using Wellingford software - IWWS. This makes creation and updating of water system models much easier.

Many challenges lie ahead to make the exchange and updating of data in both systems more interactive.

SUMMARY

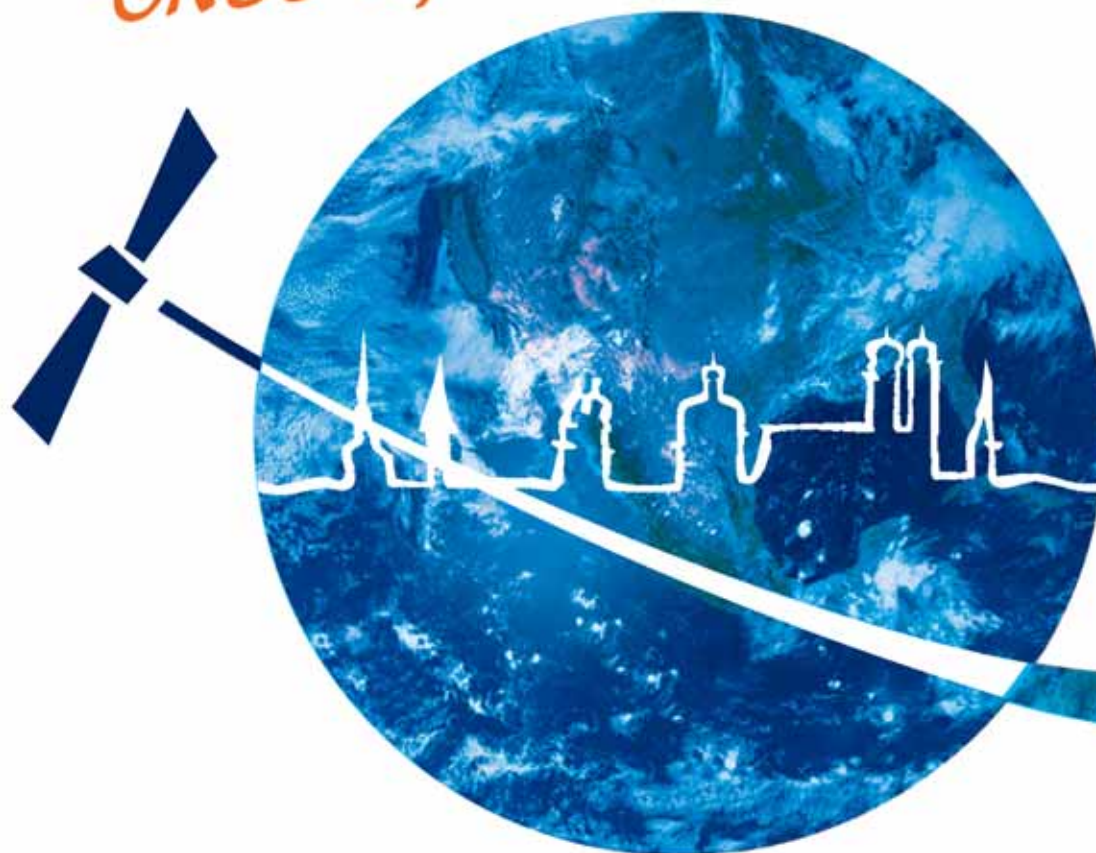
The success of GIS implementation is about conversion of data and development of traditional GIS applications. Integration to external systems will certainly bring more benefits.

An effective data verification and updating strategy is also crucial to ensure that the systems provide the most up-to-date data for various applications. ■

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Brendan Boyle
Chief Executive
Land Information New Zealand (LINZ)

Land Information New Zealand (LINZ) is responsible for providing New Zealand's authoritative land and seabed information. Among its major functions are building and maintaining the geodetic system, providing cadastral survey products and services via Internet and its five Processing Centres, national topographic mapping at 1:50,000 to 1:4,000,000 scales, and monitoring property valuations. LINZ is also the national hydrographic authority and provides administrative support to the NZ Geographic Board, chaired by LINZ's Surveyor-General. Prior to his appointment as Chief Executive of LINZ, Brendan Boyle was the inaugural Director of the e-Government Unit at the State Services Commission. He is a Law Graduate and an MBA from Massachusetts Institute of Technology. Talking with GIS Development he lays emphasis on "cheap data availability" as one of the essentialities for booming geospatial industry.

Q. Could you share your thoughts on labelling GIS as one of the "Disruptive Technologies"?

At recently held Cambridge Conference, while talking of GIS as Disruptive Technology, I tried to draw parallels between the history of disruptive technologies that we have seen in other industries as software, finance, retail and, ask the question that "what does it mean for the current geospatial market?". We have seen new entrants coming to the market with different products and services proving to be disruptive to the incumbents.

Some of them are quite obvious; we have got open source movement, development in GPS technologies, companies coming in the market from the IT mainstream (Google, Microsoft, PB), who have started processing geospatial data. We have seen far greater use of geospatial data in the government sector and more pressures for the availability of the government geospatial information in the most cost-effective manner possible. For the government of New Zealand this has been particularly appropriate since we have been trying to open up and make available more

data. We have been making information/data available electronically at the cost of dissemination and extraction. Other jurisdictions operate on other business models. The internet is clearly a disruptive new channel and will be the major source of data provision electronically. There is convergence being seen around - wireless, mobile, location based services - all utilising geospatial data and this is opening up new markets and offering quite different products and services that the private sector is best equipped and positioned to innovate around, subject to data being available at a reasonable cost.

Q. Where does GIS stand as compared to industries that have high market volumes?

We are producing a lot of geospatial data from converting the paper data into the electronic form; once we have data in e-form, this opens up tremendous opportunities for utilising the information. The innovative mix-n-match of the sourced data with other information in order to create new products and services is exciting. There are estimates that 80 per cent of the data that government holds has some geospatial flavour. If that is

private sector

true we are going to see far more products and services developed, which utilise the data in some manner. At the moment this may appear small, but with the internet and with government data being made available more and more and at cheaper rates, this will lead to the development of innovative techniques and applications ultimately benefiting the users. Non-traditional GIS companies see the trends and are coming in. This is also very good for the governments because there will be greater choice of providers together with increased choice of channels.

Q. Traditionally governments have been holding data. Do you think economic reasons will now make them opening up the data availability?

I can only see information

freeing up from the existing status quo. Different governments are at different stages and many are facing the issue. I can only comment with authority on what we do in New Zealand. We are in favour of availability of data as cheaply as possible because we are not in the business of competing with the private sector for the provision of geospatial information. I can see more and more pressure coming on governments to free up data.

We are already seeing such developments in Australia and UK and I think this will only increase. It will not be 'free' but more likely at cost of extraction and not at a cost derived to effectively tax users.

This is also consistent with the idea of utilising Creative Commons Licences that

With the internet and more government data being made available at cheaper rates, development of innovative techniques and applications will follow

some governments are exploring.

Q. What primarily was the New Zealand (NZ) government's reason to make data available to public?

First, our policy is that government should not compete with the private sector in the same market. The second element is that even if the government was forgoing some revenues by making this information available, the counter benefit is that making the data available and allowing the industry to innovate stimulates economic activity thereby creating value. So the general theory is that overall economic benefit is in favour of opening up of data.

Q. Could you briefly outline the evolution of Landonline?

Landonline was initiated in 1997 and designed with a vision of creating a fully integrated electronic survey and land titling system. Following conversion of survey plans and land titles from paper to image and structured data, the system went "live" in 2002. Now in 2007 we have electronic lodgement and automatic registration of approximately 75% of all land titles transactions and 100% lodgement of all cadastral survey datasets (survey plans). By late 2008, 100% of titles transactions will be lodged via Landonline.

It has been an enormous multi-year programme with significant elements of change experienced by staff and customers. Soon paper will be but a distant memory!

Q. What suggestion do you have for the governments embarking on 'e' land administration programmes?

You have to have a clear and consistent policy and regulatory environment. You must have structural elements in place - standards, laws and systems. If you have that in place at the national level, you are best placed to move ahead with bringing in the 'e' component to the system. If you want to have surveying and land titling go hand in hand then you may also need to think structurally. I would summarise key elements as

- Right Regulatory model

- Clear Policy

- Develop a strategy for information on a national basis

- Work closely with the stakeholders and the customers during the design of the system

- Pick really good partners who also aid in providing the latest technological updates and who can deliver on time and within budget

- Scour the world and learn from other jurisdictions - what works well and what has not. ■

API's, Mashups & 'Ur own World'



Figure 1: 'GIS Events' Mashup created in GME

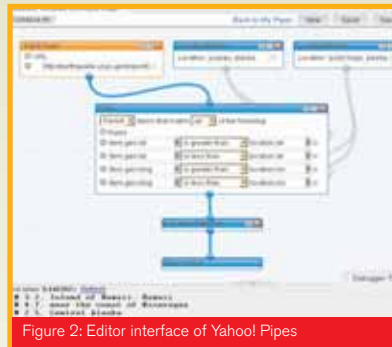


Figure 2: Editor interface of Yahoo! Pipes

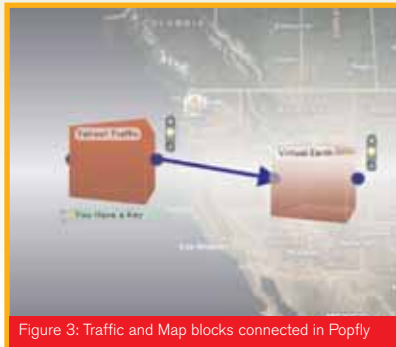


Figure 3: Traffic and Map blocks connected in Popfly



Figure 4: Traffic in Seattle Mashup, output of Fig.5

The web technology is in a phase of transformation, in the generation of Web 2.0 where we are experiencing new ways of communication and collaboration through new apps, social-networking sites, wikis and more to mention, the Geo domain has also entered in to a new era.

Look at this simple example, these days you no more need to visit the USGS website for the new data sets published; you just need to subscribe to their feeds to receive automated updates at your end. One way or the other the Geo-Domain is also moving in to the next version of Geoweb 2.0 through mashups, geoportals, dynamic 2D / 3D clients etc.

Since 2004/2005 the whole world has

experienced some amazing applications and API's from the IT-gurus like Microsoft, Google and Yahoo and along with API's from and for the Geo-world itself.

With the 'Rise of API culture', the world-wide-webizens are experiencing a new world the web-2.0 is providing.

The use of API's over web is increasing and today you name a popular web service, you can find an API from them. To mention a (very) few of them:

- Flickr API for photo sharing
- Technorati API for blog search
- del.icio.us API for social bookmarking
- Google Maps API for Mapping

This article tries to bring out the awareness about Mapping APIs & Mashups that are gaining popularity, and will in the end discuss some mashup editors, that have started to

surface this year, which will help you in effortless mashup creation.

WHAT ARE MASHUPS?

Mashups are a new breed of applications that combine(s) data from more than one source and help in making out an integrated tool (for example combining Google Maps with Classifieds information). Thus mashups help in creating/envisaging new web services for your personal and commercial uses.

MASHING THE API'S

Application Program Interface commonly known as API's are codes that provide an interface between the application/program and the requests made by the user accessing the application. For example the computers we use are a collection of API's that perform their individual functions, and the standard applications that users build upon, depending on the need the required API's are accessed by a programme currently running.

In the web for example the Google Maps API provides developers the Google Maps interface in web applications and also provides various utilities for manipulating the maps.

ProgrammableWeb has a list of Mapping API's, For a detailed list I would like you to refer to this link

<http://www.programmableweb.com/apis/directory/?apicat=Mapping>

An interesting note to make here is that the Mashups that have the mapping component are taking the bigger piece of pie with 47% (Refer to Fig.6). The site also lists the categories of API's of them 47 fall in the Geospatial domain (Refere to Figure 5).

MASHUP EDITORS

Now after reading all this stuff, you might have one question. "How can I create Mashups?" The solutions for this are the Mashup editors. The current emphasis is on editors that provide the user a Visual interface with drag and drop kind of situation, and finally allowing embedding of the mashups into a web page. So, what does this mean to you? This means using editors like Microsoft Popfly and Yahoo! Pipes "You no more have to write code to make mashups (most of the times)"... Wow!!

We will quickly move on to look in to very briefly some of the interesting and popular mashup-editors that have been launched in 2007. The current article covers Google Mashup Editor, Yahoo! Pipes and Microsoft Popfly.

Google Mashup Editor

Google has launched Google Mashup

editor (GME) beta and this requires an invitation from Google, to use this service.

After you receive your invitation you can start using the online interface in a web browser (Firefox 1.5+ and IE 6+) to make basic web applications and mashups. To use this service you are expected to know some programming and idea of technologies such as XML, JavaScript, CSS and HTML. So it can be inferred that this application is mainly aimed at developers, rather than ordinary users.

For the mapping community the real power of GME lies in its tight integration with Google Maps. What's interesting in GME is that all your projects are shared at the end of Google and the projects can be collaborated online with other Google users, who can use, copy and modify the existing projects to suite for their use. As an example I tried to use the "Map Wiki" project provided under sample projects of GME, went in to the code available under the Editor tab, modified the title from wiki maps to GIS Events and

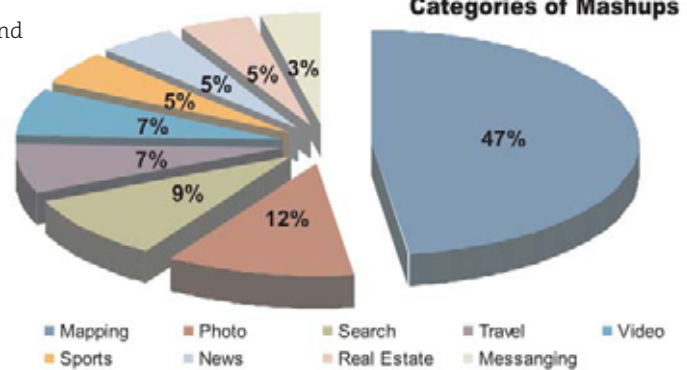


Figure 6: Categorisation of Mashups at ProgrammableWeb

published the mashup at <http://gisevents.googlemashups.com/> where I have placed three events as a sample (Refer to Figure 1). Other users can now add their own GIS events to this site utilising the wiki mechanism that is underlying with in the code.

Yahoo! Pipes™

This interactive RSS feed aggregator and manipulator was released by Yahoo at the start of this year. This web application provides a GUI for building applications that aggregate feeds and other services to create and publish new web apps.

The Pipes interface comes with a list of functions that helps you perform various mashup actions through Modules, in which each module has a special purpose. One of them is the **Location Builder** that converts a description of a place into geographical data. It recognises addresses, zip codes, airport

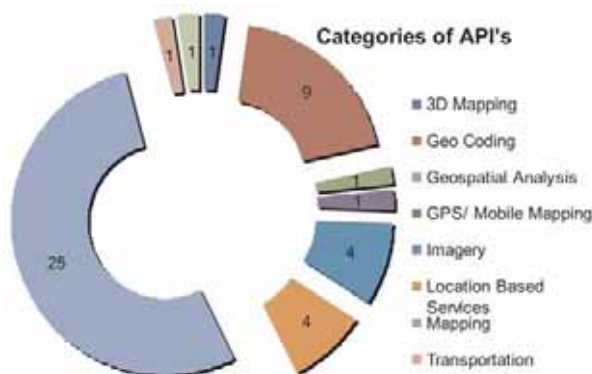


Figure 5: Mapping APIs listed at ProgrammableWeb

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'Mashup' originally referred to the practice in hip-hop music to produce a new song by mixing two or more existing pieces. The web version of a mashup is pretty similar in which you'll mix **map data, photos, videos, news feeds, etc.**

codes, city/country names, and U.S. city/state names.

Yahoo pipes web page lists a Pipe that is made out to geo-locate the earthquake data coming from U.S. Geological Survey (usgs.gov) RSS Feed <http://earthquake.usgs.gov/eqcenter/catalogs/eqs7day-M2.5.xml>

For details on the pipe (Refer to Fig.2) and how it works visit the link <http://pipes.yahoo.com/gisdevelopment/locationbuilderexample>

There are numerous pipes that have been created using various data sources that can be cloned for your use. For a complete reference you can visit the Yahoo Pipes site <http://pipes.yahoo.com>

Microsoft Popfly™

Currently under beta version, Microsoft Popfly is another mashup editor with amusing GUI. Popfly consists of Blocks that perform various functions which can be dragged and connected with each other. The uniqueness of Popfly is that you can get a preview of the output while you are still working on the application, unlike the GME and Yahoo Popfly where you need to compile your program before you can run.

To use this beta version you need three things - one an account with Microsoft, two an invitation request for Popfly and finally the installation of Microsoft Silverlight™. (<http://www.microsoft.com/silverlight>) After you have all of these you can start using the Popfly web application.

Of the various blocks available at Popfly, the ones that would be of certain interest for us are the blocks available under the **Maps category**. Under the maps category currently 11 blocks are available. The important of them is the *Virtual Earth block that adds the Virtual Earth maps interface to your application*.

As an example I have used the mashup "Traffic in Seattle" that uses Microsoft Virtual Earth block and Yahoo Traffic block (Refer to Figures 3&4). Popfly also provides an option for copying the Popfly projects from others for your customisation. In Popfly there are options for creating a webpage where you can add your Popfly projects. Microsoft is providing Microsoft Popfly™ Explorer an add-on component for Microsoft Visual Studio 2005 and 2008 that enables you to create and share Visual Studio projects on the Popfly Space network. For more information on Popfly you can check out the website <http://www.popfly.ms>

THE FUTURE TENSE OF MAPPING MASHUPS

As of now, the mashups are still limited to the techies or geeks, but with more and more editors surfacing day-by-day, ordinary users will try to experiment and realise the values of the Mashups through the WYSIWYG editors.

So the Mashups will no more be limited to the developer community but a new set of user community will pop up with applications by twining various data sets. And for the question "where the mashup trend is going?", the answer is that various niche areas will be benefited by the use of mashups by mashing up their data with the data from other areas.

And what promise we might expect from the Mapping Mashups is that every thing in your locality might be associated with Location as more and more datasets look towards XML as a data standard for web.

That means one day you would wake up to see all your News, Web Friends on various social networks, your own stuff like photos etc to be having the component of Location. And as we have observed through the statistics previously from Programmable Web, around 25 out of 50 API's and 47% of the mashups being listed have the mapping functionalities at this moment of time. So in future we can expect more innovations to be coming up in terms of mashup tools and 'Mashups may be one of the major drivers for getting nearer to the aim of a Location enabled society.'

For the complete article visit

<http://www.gisdevelopment.net/magazine/global/2007/November> ■

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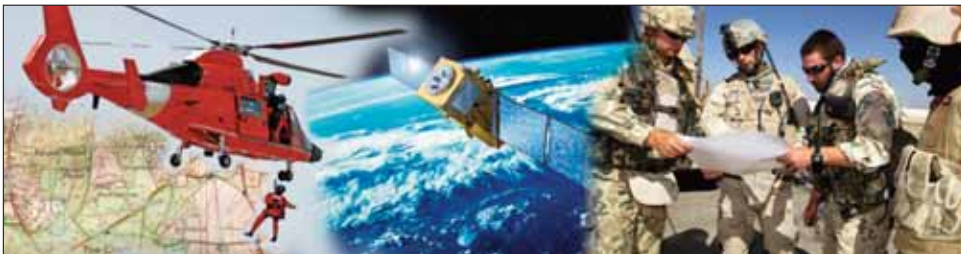
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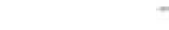
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LBS: Future Market Trends

The term LBS has become part of everyday language over the last few years. Strictly speaking any service that is based on position is an "LBS" service, for instance positioning oil rigs or mining machinery. However, LBS is now more generally accepted to mean specifically those positioning services available through mobile phones and it is these mobile phone based positioning services that are the focus of the LBS technical sessions in this conference.

Of course positioning of mobile phone handsets is already an intrinsic feature of network design because the network needs to know where a hand set is, i.e. in which cell, in order to transmit and receive calls and data from it. However this network based positioning can be quite coarse although refinements to it have been developed. More recently we have become familiar with alternative positioning technologies such as satellite positioning, currently GPS of course, and now even more technology choices are becoming available such as WiFi, WiFi with RFID. In the near future, WiMax may also be a potential positioning candidate.

GALA, a major European Commission market analyses for satellite positioning starting with a blank sheet in a major analysis in 2000, looked at all potential applications of satellite position in all markets (aviation, maritime, road transport etc) and defined 100 such applications in 20 markets. This initial analysis has since been updated every 2 years or so, but from the very beginning, the use of satellite positioning in mobile phones has been the most significant application in terms of the number of satellite receivers involved, i.e. the number of mobile phones with GPS or, eventually, with combined GPS and Galileo receivers. Fig 1 from a 2005 analysis shows the growth of satellite positioning (or generically, Global Navigation Satellite Systems - GNSS markets) out to 2025. It shows the dominance of mobile phones (in blue) with a

forecast of 61% of the market or about 2 billion GNSS phones by 2025. The road transport applications, cars and commercial vehicles, are the next largest in terms of numbers of vehicles with 37% of the market or just over 1 million vehicles with GNSS. This means that in 2025 98% of all the GNSS receivers are forecast to be in mobile phones or vehicles.

Perhaps the more surprising implication of that is that every other market and application is contained within just 2% of the total GNSS market (measuring by numbers of GNSS receivers).

The mobile phone market is one of the most dynamic and unpredictable markets and most market specialists in this field only look forward 5 years at the most. Fig 2 shows the successive forecasts for GNSS mobile phones carried out as part of the Galileo programme.

The top group is the forecast of the

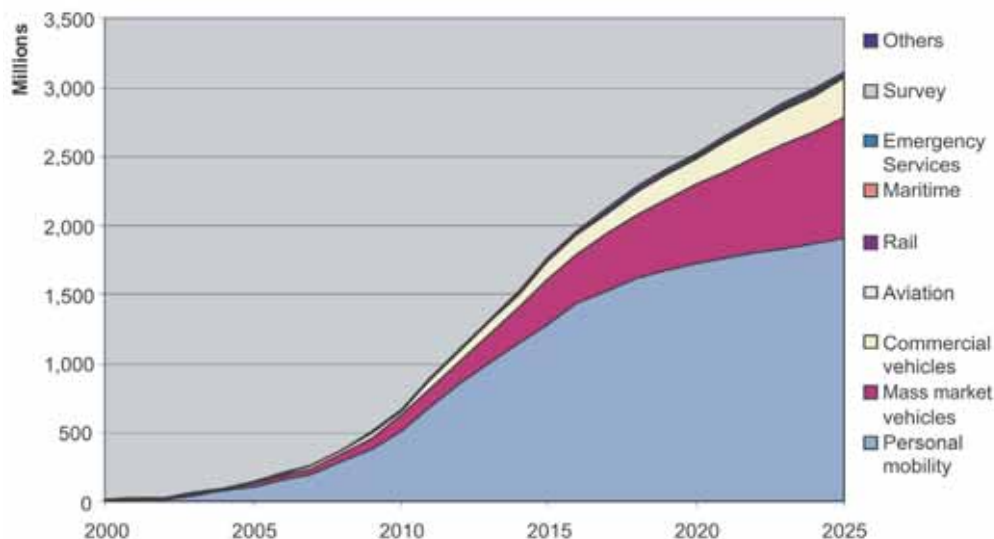


Fig. 1 GNSS market size (receivers) by market-all regions

addressable market size, i.e. the total number of phones in the world and the lower group is the number of those phones having a GNSS receiver. Superimposed on these lines are recent spot values. So while we undershot the total number of phones, we were much closer with the forecast of GNSS phones. Our most recent forecast, the green lines, have turned out to be the most accurate.

LBS MARKET ISSUES

The market forecasts shown above are forecasts of GNSS mobile phones. They assume that each GNSS mobile phone will contain just one receiver chip although the receiver might be GPS combined with Galileo (or, in principle, even GLONASS or Compass). However, we all know that a single phone may provide many different location based services for the user. A current EU study called AGILE (Application of Galileo in the LBS Environment) identified 18 different LBS service types (for the consumer market) and they are shown diagrammatically in Fig 3. They are grouped into categories, e.g. e-commerce, emergency, or entertainment. Additionally, they are identified by their sensitivity to indoor operation and to service quality, i.e. accuracy and availability. This application grouping facilitates the work on business analysis currently being carried out in the project. However, even this is not the complete list of LBS services; many of the applications can be subdivided further, e.g. "People Tracking" might be sold as tracking of friends, or of children, or of older family members suffering from memory loss or dementia. Finally, new ideas are coming along all the time.

With such useful applications and with so many mobile phones in the

world, one might ask why have LBS services not grown faster. Perhaps it is a case of which comes first, the chicken or the egg? On the one hand, obviously customers cannot buy LBS services unless the phones can provide adequate position information coupled with useful, reliable, value for money services. On the other hand, enabling accurate positioning technology, such as GNSS, in the phone and connecting that with the information required to deliver LBS involves both investment and the organisation of many different players. Information content needs to be accurate and reliable from the beginning, otherwise customers will turn off. For example, traffic hold ups and accidents on your route need to be announced very quickly after they occur, their impact needs to be quantified continuously and when the problem is cleared, we need to know straight away. Such considerations of quality apply similarly to all the applications, each application is different - has different players, different software a different business case. So initially, there has to be an act

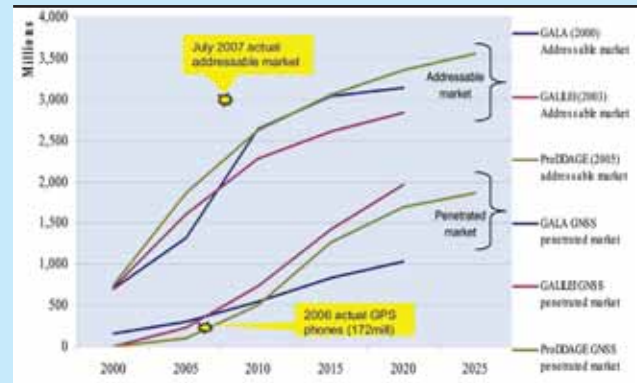


Fig. 2 GNSS mobile phones' forecast (part of Galileo Programme)

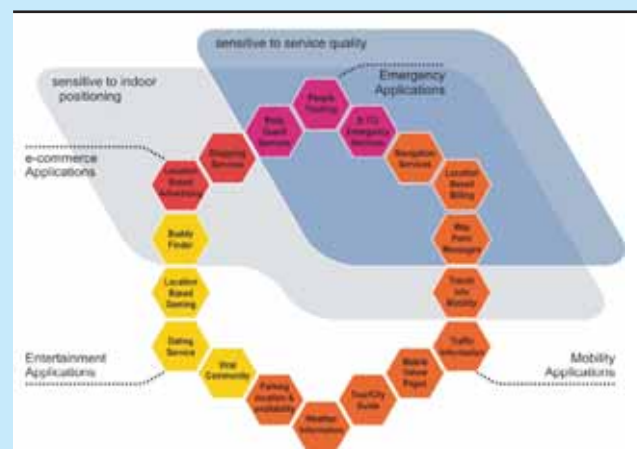


Fig. 3 Different LBS applications (for the consumer market) as identified by AGILE study

of faith on the part of the network operator to make the investment and to organise the information and service providers into a workable and lucrative value chain.

Furthermore, different market drivers may apply differently in the uptake of different applications and these may not be under the control of the network operators. For example, the emergency application would be stimulated by regulation requiring accurate positioning to be provided with a call to the emergency services. This has been enacted in the USA, the so called E-911 legislation, and this has resulted in the majority of phones in the USA having

Table 1	Technology	Keywords
	Cellular network based positioning technologies	Communication networks, cell-ID, measurement of distances, measurement of angles
	GNSS	GPS, Galileo, SBAS (WAAS, EGNOS etc) global coverage, high accuracy, free signal in space, poor indoor coverage
	UWB based positioning technologies	Signals with very high bandwidth, techniques as above
	WLAN based positioning technologies	Communication technology, signal strength, symbolic approaches
	Transponder/ RFID based positioning technologies	Requires pre-installed transponders, provide position update
	Dead reckoning technology	Gyroscopes, accelerometers, computes position displacements
	Digital maps, map matching, map aiding	Positions matched to map items, or measurements from digital maps

GPS. In the EU, such legislation, E112 in this case, was considered, but not enacted (yet) and so the penetration of GPS phones in Europe is still very low. The beauty of legislation like this is that, because of the high turnover of mobile phones, the market penetration rises very quickly, a couple of years or so, to near saturation. However, having an accurate positioning capability within a phone because of such legislation does not automatically enable the full range of LBS applications; it is the customer that decides on these once the services are available and based on such issues as value for money, good fun (for games), fashion (my friends have it), convenience, time saving and safety of family etc.

We are seeing the enabling factors all beginning to come together now and there are indications of a stronger uptake of LBS in the near future. One leading handset provider, Nokia, has launched a GPS-capable handset together with maps and routing services; this is an important technical development packaged with a new business strategy that may encourage other providers to follow.

Once LBS services show that they deliver what the customer wants, in a user friendly manner and at an acceptable price, they will quickly become the

norm and, with the revenues flowing to the suppliers, improvements and refinements will make them even better.

POSITIONING TECHNOLOGIES

Table 1 shows positioning technologies for mobile phones and is by courtesy of the EU AGILE project already mentioned.

This shows a surprising number of positioning technologies that could, potentially, be used with mobile phones. The top two are proven and well used, but the other technologies are future candidates. An important consideration is the availability of existing standards to reduce the amount and cost of tailoring to the phone environment.

Thus, as many high-end phones already use WiFi, the incorporation of WiFi based positioning should be relatively straight forward and economical and could provide excellent indoor positioning in large buildings or covered places such as airports. The combination of WiFi with RFID devices is another promising technology based on well established standards and components.

The use of accelerometers to provide a low cost inertial navigation system is

also being investigated and we must not overlook the power of map matching for those applications that use maps.

I recently used my GPS phone with a well known car routing software and map while on a train and I was surprised that it positioned me on a parallel road that was over a quarter of a kilometre away instead of the railway track.

The first 2 technologies in the table, network based and GNSS based positioning are available and are in use. To a certain extent they complement each other in that while network based positioning works wherever the phone works - including indoors - it is generally much less accurate than GNSS positioning. We expect GPS to give us under 10m accuracy, but ongoing system improvements have already improved that to better than 5 metres. SBAS systems such as WAAS and EGNOS might take us towards 1m and the addition of Galileo (with its better indoor performance due to its signal structure) will double the number of satellites resulting in even better indoor performance in more places (higher availability) and an accuracy in the order of 1 m. However, indoor performance from satellite navigation is unlikely to match that of network positioning and unlikely to meet the users' expectations in that respect.

Combining both technologies would provide the best of both worlds and there are initiatives in hand to provide a seamless positioning capability within a mobile phone that continuously uses the technology providing the best position, i.e. network or GNSS. After all, the user doesn't care what technology is being used as long as the service he or she is using gives the best solution wherever he or she is located.

FUTURE

Who would have thought in the 1980s, when analogue mobile phones were confined to fixed installations in vehicles, that nearly half of the population of the world would have a self contained mobile phone by 2007. That such phones might be used to provide seamless connection to the internet for business and multimedia purposes, would contain cameras rivaling good stand-alone digital cameras, radios and MP3 players, play TV and contain positioning devices accurately to a metre and have a battery that lasted a few days would simply have been considered impossible. However, mobile phones are now an established general purpose technology and the services based upon the position of the phone and its user are becoming an important part of the services wanted

by users. We have seen that a number of complementary positioning technologies are either available now or being developed so that we can expect accurate 1m positioning to be available in most places that we would need it, in buildings as well as outdoors and in underground car parks as well as near office windows.

We can expect that satellite positioning will become progressively more accurate and more reliable as existing systems are improved and as new systems, such as Galileo, become operational. Another feature of satellite positioning systems is the potential use of the so called "integrity" signal that is already provided by SBAS systems (like WAAS and EGNOS). This was designed to provide warning of any unacceptable reduction of performance to those using GNSS for safety critical

applications such as navigating aircraft. However, the signal will be free and could provide useful additional information to provide confidence that the satellite positioning constellation is operating correctly. For example it would be valuable to know that in applications calculating fees from position, the positioning system is operating as expected. In summary, the future looks bright. Phone and positioning technologies will, almost certainly, continue to improve; mobile phones will become the most important piece of technology. ■

Author wishes to thank the EU AGILE project for agreeing to the use of project material. Further details can be found on the project web site at www.galileo-in-lbs.com

Bryan Jenkins
ESYS, Plc., UK
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Blogs



Blog Buster

What does 'the user' expect from 'the core' capabilities of a system? Is it ever possible to have a 'flawless' core, such that accessorising it with enhancements in quality and performance is all we need? Is this the scenario with the GIS industry, particularly the GIS software space, where we have not seen much development taking place in its core capabilities, such as overlay, buffer analysis, network, map rendering, et. al.?

Interaction of the 'User' and the 'GIS system' would probably lead to the following conversation...

GIS Genie: I gave you a 'core' system that could take care of your geospatial data and analysis needs about a decade ago, and I see you have put it to good use. I am more powerful now, tell me what do you wish for?

User: Yes! I thank you for that, it could integrate, process, analyse and even represent all my data, be it an image taken on vacation or from the satellites high above, be it the vector or raster map data or a sound and text file, you managed to integrate them in various ways to provide the services to me

and various other professionals. I sure am satisfied with it. But you gave me all this more than 10 years back. How have you become more powerful?

GIS Genie: Well, I do the job in less than half the time I used to take earlier as I have several extensions that help users to make their work simple.

User: But is it not the IT industry that is responsible for it? You do your job efficiently because of fast and robust computation technology. You are able to help users with extensions because the IT professionals are writing the codes to do so; they are even making it simple so that a common man can even integrate their location based information for various applications.

And the Genie had no answer....!

GIS this! GIS that!

Why is it so hard to explain to my grandma what is it that I do? How can I explain a layman about the use of location based information technology? Why is it that I am not as recognised as my IT counterpart? Some questions that haunt the "GIS Professional/Specialist/Expert/Engineer/~~whoever you want to call me~~!"

Should the GIS professionals fight for their recognition and hope for a "label" or should we integrate seamlessly with other information systems BUT at the same time maintain our importance and integrity.

The following is the compilation of selected blogs from various sect of GIS users, some of them giving the technological low-down and some expressing their viewpoints through this medium of free press.

Until next time... Ponder and Evolve!

This is the blogspot of self-proclaimed president for life of



the Northern California Intergraph Geospatial User's Community (NCIGUC). The blog mostly discusses the geospatial technologies at Intergraph along with random thoughts and ideas related to GIS.

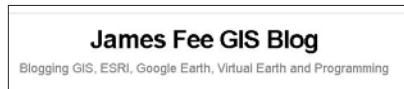
Notably you shall find that most entries are in the GeoMedia category, a quick browse will inform about its past, present and future. It proves to be a good blog for people who use Intergraph geospatial products or want to find information about it. Do browse through the Popular Posts section, interesting reading ahead!

<http://jeffhobbs.net>



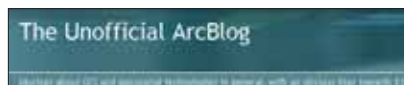
The objective of this blog is to deliver news fast! That is, the blog is a faster version of the Directions Magazine portal. This is a highly active blog with an impressive list of contributors who give their 'take' on the story. Do visit the archive section for the earlier happenings of the industry. Also browse through the 'About us' section to know more about the contributors and the philosophy of the blog.

<http://apb.directionsmag.com>



Light and informative reading ahead! This is James Fee's personal blog focused on geospatial technology. It discusses developments amongst the big wigs like, ESRI, Microsoft, Google, NAVTEQ, Mapquest, Oracle and open source GIS (OSGeo). And topics related to maps, programming or technology. James fee is a certified GIS professional and is maintaining this space for almost 2 years now. Don't forget to check out the sites extensive Links section and another webspace that he maintains called, <http://www.planet-gs.com>.

<http://www.spatiallyadjusted.com>



Marianne Cardwell, currently a GIS Programmer, is the owner of this blog. Though the posts are irregular and random in nature, they are somewhat thought provoking. They highlight the problems faced day-in and day-out by professionals working with the ESRI products. The recent post on 'ArcGIS Server MapTips' is quite informative,

maybe known to many but still a little brush up on skills wouldn't harm anyone.

<http://gis.typepad.com/blog>



This blog is the master piece of Glenn, Founder & Managing Editor of GIS-user.com, LBSzone.com & SymbianOne.com. As a technology aficionado, he has written several posts that integrate various technologies, multimedia, web, mobile, etc. but the centre of attraction is the geospatial aspect associated with them.

In this blog, he intends to help the users to get the Free GIS data products like DRG, DEM, DLG, DOQQ, Census data, etc. Many of the posts show recent technological advancements, mash-ups, source of free data and more with a personal touch. He also maintains host of other blogs, AnyGeo - Anything Geospatial; Anything Google... but mostly Google Maps & Google Earth; Glenn 95 - The Nokia N95 user; to name a few.

<http://gisdata.blogspot.com>



Leszek Pawlowicz is the blogmaster of the site. A Quiz Whiz and a consultant, he covers a wide range of free (and cheap) tools for handling geographic data, including GIS, GPS, Google Earth and Maps, neogeography, free data resources, and other related technologies. Most of the recent posts are informative and highlight the usefulness of the data or the software being discussed. A must read for students and researchers.

<http://freegeographytools.com>



Morten Nielsen adds a .Net and JavaScript perspective to the GIS world with this blog. The posts are technical, programming wise, but provide an understanding of topic in discussion. It is a rich database of information dating back to 2005 so, browse through the information with categories that interest you. For those who can read a lot, this blog is intense both in terms of quality, quantity and information.

<http://www.sharpgis.net>



Warning! This blog is new, only 4 months old. Allan, a GIS professional in the making at the George Mason University, writes this Blog. Most of the entries are explanations of the Lab Work done by him and links that he finds useful. He hopes that when this blog progresses, it would discuss and display final products, created by Cartographers and GIS professionals from all around.

<http://allanscartographicblog.blogspot.com>

Gaurav Sharma, Sub Editor, GIS Development
gaurav.sharma@GISdevelopment.net

The Largest Show on Geospatial Technologies in South Asia is here again...

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Enterprise GIS and Infrastructure Development

Highlights of the Conference

- Plenary Sessions
 - Infrastructure Development
 - Enterprise GIS

- Satellite Imaging and Photogrammetry

Seminars

- Enterprise GIS

Industry Partner



- Infrastructure Development

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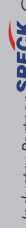
- High Resolution Imaging

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- Land Information System

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- User Meet

By



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Minister of Science & Technology and Earth Sciences, Govt. of India



Prof. Saif-ud-din Soz
Minister of Water Resources Govt. India



Rajeeva Ratna Shah
Member Secretary, Planning Commission, India



K K Singh
CMD, Rolta, India



Rajendra S Pawar
Chairman, NIIT, India

Plenary Speakers



Greg Bentley
CEO, Bentley Systems USA



Lisa Campbell
VP-Geospatial, Autodesk USA



Rajesh Mathur
President, ESRI India



Prof. Josef Strobl
Director UNIGIS, University of Salzburg Austria



BVR Mohan Reddy
CMD, Infotech Enterprises India



Jill Smith
President & CEO, DigitalGlobe USA



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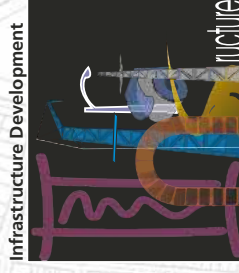
Dr. K. Radhakrishnan
Director, NRSA India



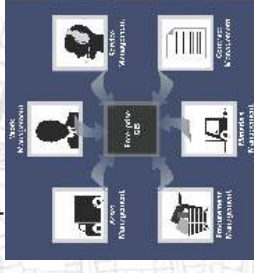
Brad Skelton
CTO, Leica Geosystems Geospatial Imaging USA



Kanwar Chadha
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Enterprise GIS



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www.AirportGISConference.com

29 - 30 November

GeoS 2007
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www.geosco.org

30 November - 1 December

EEGCS 2007
Warsaw, Poland

<http://eurogeo.top.upv.es/eegecs/warsaw>

December 2007

3 - 5 December

Geodiffusion 2007
Quebec, Canada

www.geodiffusion.com

4 - 7 December

GIS Conference 2007
Suva, FIJI

www.lands.gov.fj/gisConference.shtml

4 - 6 December

IGNSS2007
Sydney, Australia

www.ignss.org

4 - 6 December

Earth from Space
Moscow, Russia

www.transparentworld.ru/conference

5 - 7 December

2007 NaviForum
Shanghai, China

www.naviforum.org.cn/en2007

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Spatially Enabled Government 2007
Gauteng, South Africa

www.iqpc.com/za/spatiallygovernmen

6-7 December

Laser Scanning and Digital Aerial Photography. Today And Tomorrow
Moscow, Russia

www.rsprs.org

10 - 12 December

Middle East Spatial Technology Conference and Exhibition 2007
Bahrain, Manama

www.engineer-bh.com/mest2007/message.htm

12 - 14 December

3Dgeoinfo 07
Delft, The Netherlands

www.3d-geoinfo-07.nl

17 - 19 December

b-GIS@Asia 2007
Trivandrum, India

www.tagsasia.org/bgisasia/bgisasia

January 2008

14 - 15 January

HealthGIS 2008
Bangkok, Thailand

<http://e-geoinfo.net/hgis.html>

17 - 18 January

ESRI Asia Pacific User Conference
Tokyo, Japan

gis.esri.com/intldist/intlevents_ex.cfm

21 - 24 January

DGI Europe 2008
London, UK

www.wbr.co.uk/dgieurope/index.html

21 - 24 January

Second International Conference on Cartography & GIS
Sofia, Bulgaria

www.datamap-bg.com/conference2008

27 - 30 January

GIS Ostrava 2008
Ostrava, Czech Republic

www.gis2008.com

February 2008

6 - 8 February

Map India 2008
Greater Noida, India

www.mapindia.org

7 - 8 February

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Greater Noida, India

www.location.net.in/india

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Hyderabad, India

www.gisindia.in

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www.intergeo-east.com

19 - 21 February

Munich Satellite Navigation Summit 2008

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www.munich-satellite-navigation-summit.org

25- 28 February

12th Annual GIS / CAMA Technologies Conference
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http://www.urisa.org/gis_cama

21 - 22 February

International LiDAR Mapping Forum 2008
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www.lidarmap.org

25 - 29 February

GSDI 10
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<http://gsdi.org/gsdio/index.htm>

March 2008

9 - 12 March

GITA's Geospatial Infrastructure Solutions Conference
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<http://gita.org/events/annual/31/index.asp>

17 - 20 March

TUGIS 2008
Maryland, USA

<http://tugis.towson.edu>

April 2008

8 - 10 April

Map Middle East 2008
Dubai, UAE

<http://mapmiddleeast.org>

15- 19 April

Association of American Geographers Annual Meet
Massachusetts, USA

www.aag.org/annualmeetings

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www.sovzondconference.ru/eng

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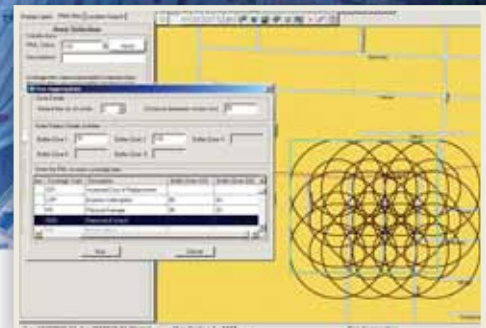
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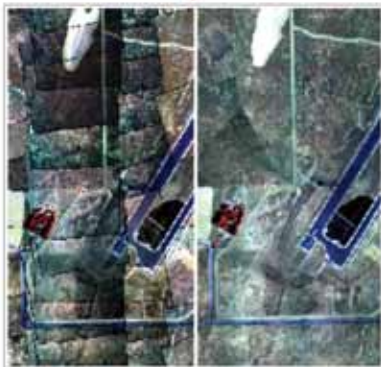
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