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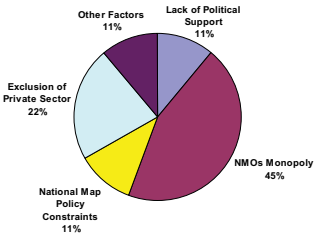

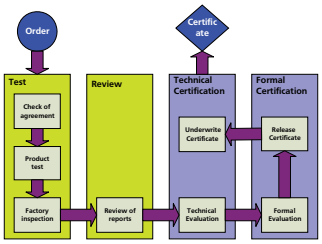

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Predictions and surveys indicate a boom in LBS.
(Read LBS news on page 36)

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Bal Krishna, Editor
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Let's go to court

To decide who can draw maps and who owns them.

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THIS note is about two developments in the mapping world that should be of interest to professionals in the geospatial industry. One took place in the United States where a group of surveying professionals have asked the courts for a ruling on who may be able to tender for public contracts to draw 'maps'. This development should raise the concern of most geospatial professionals. The second took place at the opposite end of the world in Australia where the Copyright Agency representing surveyors has sought a ruling on the ownership of intellectual property rights of surveyor's maps. While these two cases are interesting such developments are indicative both of the maturing of the geographic information (GI) profession and the willingness of professionals to assert their 'rights'.

The MAPPS case

In February 2007 in the US the Management Association for Private Photogrammetric Surveyors (MAPPS), American Society of Civil Engineers (ASCE), National Society of Professional Engineers (NSPE), and Council on Federal Procurement of Architectural and Engineering Services (COFPAES) brought a case against the government in the Federal Court. The litigation sought to change how the Brooks Architect-Engineers Act (1972) (see 40 U.S.C. §§ 1101-1104). – a law concerning how federal contractors are selected in the procurement process – is implemented with regard to 'mapping services'.

The Brooks Act is a framework for contracting architecture and engineering-related work for the federal government. The award of contracts for such work is based on 'qualification-based selection' (QBS) rather than on price. QBS is predicated on professional qualifications and experience, followed by negotiation with the most qualified firm of a price that is fair and reasonable to the government. With amendments, surveying and mapping has been added to QBS.

The Federal Acquisition Regulation (FAR) Council, made up of several government agency executives, implements statutory laws, like the Brooks Act for awarding contracts.

The MAPPS litigation is how the FAR Council has implemented the Brooks Act and related legislation (see Francica & Schutzberg 2007 and Respini-Irwin 2007a). The sticking point is that mapping services do not fall under the QBS part of the Brooks Act and thus may be contracted in the traditional price-based competition. The interpretation of the Brooks Act has been variable and implemented in different ways by different agencies when contracting for mapping.

The MAPPS litigation sought to ensure the FAR Council properly implement the Brooks Act (see statements by MAPPS 2007a). If successful, mapping would be added to the list and government contracts would only be awarded to qualified professionals such as surveyors, geodesists and photogrammetrists. The implication is that all federal contract mapping would fall under the QBS provision of the Brooks Act and need to be procured through licensed architects, engineers, surveyors and cartographers. Under such a scheme, mapping would become more expensive, complex and exclusive. It also may mean that the broader mapping community and

much of the GIS industry would be shut out of federal mapping contracts. The unintended consequences could cripple the GIS industry, damage geographic science in the US in terms of research capacity and competitiveness and shackle government agencies to only those mapping services provided by the MAPPS membership.

Several groups have prepared amicus ('friend of the court') briefs. The Urban and Regional Information Systems Association (URISA) released a statement in February 2007 opposing the plaintiffs' case because of the potential harm to the professions and the industry and details a list of problems including expanding "the scope of architectural-engineering surveying and mapping far beyond the scope of any professional expertise certified by registration or licensing as a surveyor, engineer, or architect" (see Respini-Irwin 2007a).

The Association of American Geographers, the GIS Certification Institute, the Geospatial Information & Technology Association and the University Consortium for Geographic Information Science as well as the National States Geographic Information Council have joined URISA in filing the amicus brief. The brief states that "amici [filers of the brief] would suffer injury if the MAPPS plaintiffs were to win this lawsuit … [as it] would not only insulate all federal mapping contracts from price competition, but also exclude everyone else – that is, anyone and everyone other than licensed engineers and surveyors – from even being eligible to receive a federal mapping contract" (see Francica & Schutzberg 2007b and Schutzberg 2007).

Court Decision on the MAPPS case

The Federal Court issued a ruling in June 2007 against MAPPS. According to Judge T.S. Ellis III of the U.S. District Court for the Eastern District of Virginia, MAPPS and its fellow plaintiffs do not have the standing to bring the question of implementation of the Brooks Act. This is because the plaintiffs failed to establish that injury in fact was suffered by the individual surveyors or their firms. Note here that the court only ruled on the process of law and did not address the issue of whether QBS was applicable to mapping. Further litigation might be on the horizon in the near future (see Respini-Irwin 2007b and MAPPS 2007b).

Surveyors Maps and Intellectual Property

In Australia, the Copyright Agency Ltd (CAL) brought a case to the Copyright Tribunal under the Commonwealth Copyright Act 1968 (Cth) in regard to surveyors plans and the state of New South Wales' claim to ownership. The Tribunal heard the application, evidence, submissions and made findings. Following the determination, the parties requested that the Tribunal refer the matter to the Federal Court to determine questions of law concerning whether copyright existed in the surveyors' plans within the meaning of the Copyright Act and whether surveyors were entitled to receive royalties arising from the State Government's use of the plans.

In September 2007 the Full Federal Court unanimously rejected the New South Wales Government's claim that it owned copyright in the surveyors plans. The court held that the subject plans were not made or first published by or under the 'direction and control' of the state within the meaning of sections of the Copyright Act and that even though the Government's use and supply of the subject plans fell under a section of the Act, the Government had an implied licence from the surveyors to use and supply the plans (see Yates & Kingston 2007).

As regards Crown Copyright, it was held that for copyright purposes a work is made by its author. The Copyright Act contemplates that in certain circumstances, the act of the author in making a work is to be attributed to the Crown.

Following the Federal Court's decision, the NSW State government sought leave to appeal to the High Court of Australia – Australia's highest court. The basis for the appeal was whether the New South Wales Land Titles Office may continue to freely deal with surveyors plans lodged with it for State purposes, or whether that government agency should pay surveyors royalties for these subsequent dealings. The appeal was granted in November 2007 (see Baldwin & Adams 2007).

The CAL is declared a 'collecting society' for the purposes of the Copyright Act. CAL's role is to represent copyright owners such as authors, photographers, publishers and, in this case, surveyors, and to administer the licensing of copyright works to the general community.

Before the decision of the Full Federal Court there has been very little judicial discussion as to the meaning of "direction or control of the State" and the scope of operation of Crown Copyright provisions. This appeal to the High Court may yield more certainty in the interpretation of the terms and clarifying the limits of the automatic vesting of copyright in the Crown (Wong 2007).

Implications for GI Professionals

The rhetorical question of "who can draw maps?" is asked simply to raise awareness that one may indeed do so for various purposes including that of making a living. However, when there are barriers and limitations in trying to make a livelihood it may raise the hackles of individuals and professional associations. The MAPPS case may be interpreted as one of a kind of 'restraint of trade', of a monopoly (or in the case in North America of anti-trust) and to see the Brooks Act as equivalent to one of protectionism. Were that litigation to have succeeded it would have restricted the people who could tender for government contracts to draw maps.

The MAPPS case also raises issues

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of qualifications and accreditation, of licensing and of professionalisation of the mapping community.

In North America, the Geographic Information Science Certification Institute (GISCI) (see http://www.gisci.org) provides professional certification after vetting of qualifications and experience. It is a kind of an accreditation agency for the various institutions that provide GI-type education and training. But even here the GISCI has a policy against mandatory certification in the GI profession for any purpose. The certification policy has always been voluntary.

Licensing is a very different from certification, while both might be considered as different forms of regulation. The push for certification is for the interests of the GI profession and not to debar those that are licensed and is no substitute for licensure. Having attained a professional status with the addition of letters "GISP" after one's name does not necessarily mean that those who do not have these are not qualified to undertake professional GI work. On the contrary, some of these professionals might have better experience and skills learnt on the job than from any tertiary course. Moreover, GIS, as a tool, is used in many disciplines and applications and is not narrowly confined.

Surveyors, engineers and architects have a formal licensing process to gain professional status and more importantly to obtain a practising licence. There are liability and other imposts for these professions and hence the need for strict procedures. The imperative is not so great for GI professionals although there may be an urgent need for such licensure when cases come to court for loss amounting to damage, harm and hurt.

"Who owns the maps?" is a further question but is no longer rhetorical as the case in Australia shows. More and more GI professionals now are becoming acculturated to the view that there are intellectual property issues involved. These include not only the rights of ownership, but also responsibilities. For surveyors the need for absolute accuracy is a requirement, whereas some GI professionals might argue that the map is only a representation of reality and the represented objects are in relative space. In the Australian context the inception of the Spatial Sciences Institute (SSI) that gathers together all of the spatial science professions – geographers, GI professionals, surveyors, cartographers -- may be a step in the right direction (see http://www.spatialsciences.org.au)

Conclusions

To conclude GI professionals must take note and must begin to worry. The tussle between the rights of GI professionals to practise their craft as against regulations prohibiting the opportunity to tender for lucrative mapping contracts may have come to pass. GI professionals have come to realise the importance of asserting property ownership of the products of their labour – maps and plans – as well as being ever vigilant to ensure greater accuracy to avoid litigation in the courts.

The trend seems to be that the amount and degree of litigation involving maps, GI professionals and other cognate disciplines is on the rise. This trend is reflective of GI as a maturing system, as science and study in its own rights; and more importantly, as a profession in its own right.

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Is certification of Galileo a bureaucratic overhead?

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GPS is running since more than a decade. There are user groups in all domains relying on the provided information. GPS is even used in safety critical environment, but there have been no certification of the GPS system nor are there any plans to do so. Within aviation, GPS is assumed to fulfill requirement on reliability and availability based on observations of the past. Is the discussion in Europe about certification of the Galileo SIS (Signal in Space) just another proof for the bureaucratic overhead imposed on the Galileo project? NavCert as part of the TÜV SÜD group is focused on certification in the area of positioning and navigation. The mission of the group is "choose certainty, add value". Thus it's not just a rhetoric question but instead a question which under is always important to us, to identify the value add of a certification.

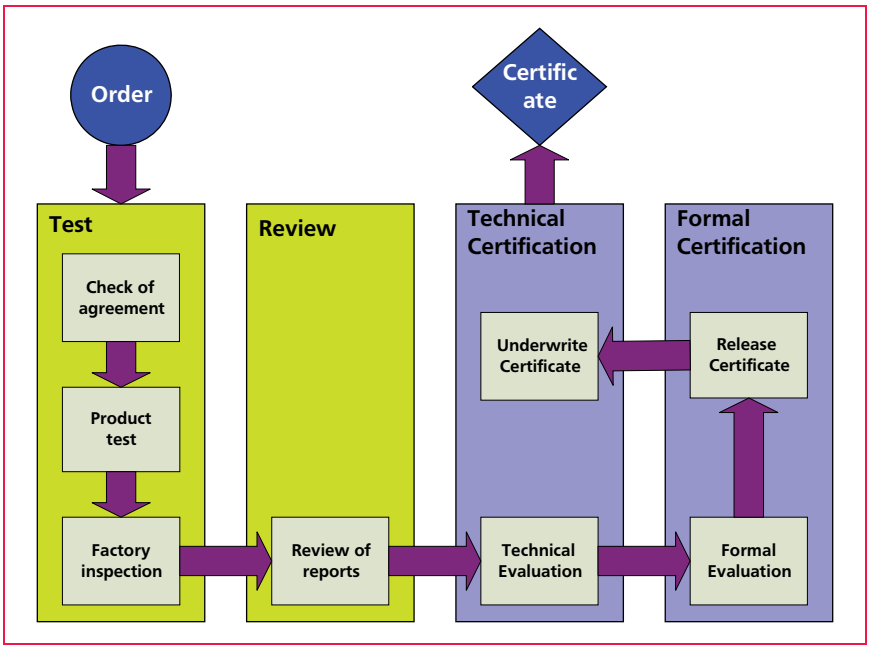

Figure 1: Certification process

Looking to Galileo, the starting point is quite different compared to GPS. GPS is running since more than a decade and Galileo as it looks now will become fully operational in 5 years. Galileo shall be used immediately for a variety of applications. Galileo already is delayed by 5 years and nobody wants to wait in 5 years time frame to use Galileo in safety critical applications as no observed reliability and availability will be available. Then after another period of 5 or even 10 years observing reliability and availability, one will come hopefully to the conclusion that the observed functionality allows the usage of the Galileo system in safety critical applications. Thus to avoid further delay after Galileo becoming operational (FOC), a certification is required. Another mayor difference between GPS and Galileo is the integrity signal, as Galileo provides an indication on the reliability and availability of the information for all services except the OS (Open Service). Due to the importance of this information, an independent validation through a certification is required.

A certification cannot guarantee any feature or functionality of the certified product or service. The certification however reduces risks in operation and increases probability that all will work as intended and planned. Certification processes differ according to the scope, the domain and the object of the certification. On a high level one can differentiate between an audit as in the certification of a management system based on IOS 9000:2000 or a certification of a product. The product certification consists of two main parts, on the one side the hands on activity typically done in a laboratory and

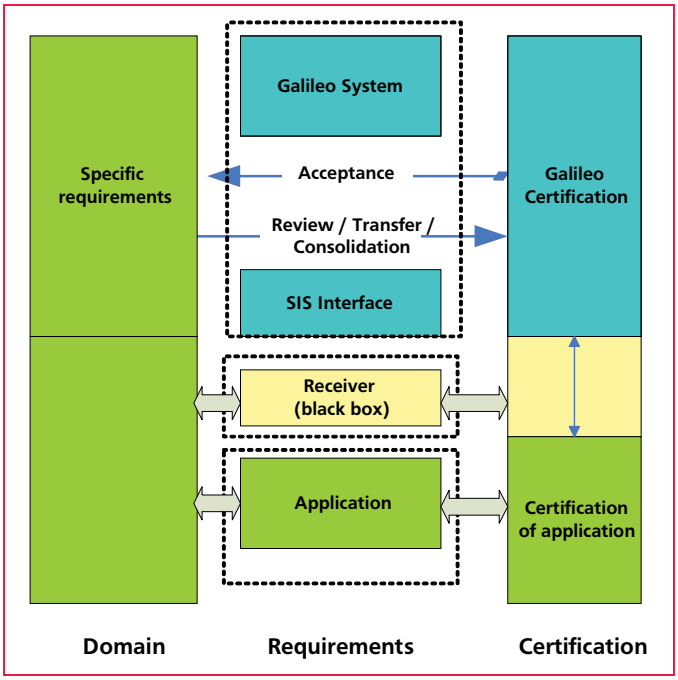

Figure 2: Galileo Certification
Source GalCert project funded by GSA, Brussels, managed by GZVB Braunschweig

the paperwork desk oriented part of the certification. This is depicted in figure 1. Each of the phases is again divided in two parts. The activities in the laboratory are split into test and review. At first, the object under test is examined, measured and analyzed and if the certificate shall apply not only to a sample of a product but to all units of the mass production, a factory inspection has to be done as well. In the second step, the review, an independent person who was not involved in the testing, will review all protocols of the first phase to identify any discrepancies, to look for completeness of the generated documents and to check if the results are in the expected range. If not, the reviewer will ask for additional information from the tester or even to redo specific tests. In the second phase the actual certification, a technical certifier with at least the same technical skills and competence as the tester and reviewer will look to all documentation from the testing including the protocols of the reviewer. Only if the technical certifier will identify no issues, he will forward all documents to the formal certification entity. Here a formal check takes place to verify that the standard specified in the order is the same as the standard according to which the tests were performed. In addition it will be validated that the laboratory, the used equipment, the tester and the technical certifier have the formal authorization to perform their work for this standard. Only if this last check is also positive, a certificate will be printed. The technical certifier will sign this certificate to document his personal liability for the certification process. Of course this liability is forwarded to the head of the certification entity and finally to the insurance company providing coverage for the certification body as required by the accrediting authority. The issued certificate typically is valid for a specific period of time depending on the criticality of the certified product; this might vary between 3 months up to 12 months. After this period a recertification has to be done which normally does not require all activities of the initial certification. A re-certification can be done for a well defined number of times and then again a new certification is required.

The certification of the Galileo system imposes some challenges as Galileo has been designed to be used by all domains (aviation, rail, road and maritime) and in a variety of verticals opposed to EGNOS which was primarily linked to the aviation domain. For EGNOS the requirements of aviation were the base for the design and for the certification of the system. Galileo has to fulfill the requirements of all domains to be accepted and used later on in a variety of applications. Thus the certification of the Galileo system has to be mapped to the requirements of all domains. A study has been performed, the GALCERT project, funded by GSA, Brussels and managed by GZVB, Braunschweig to identify a way forward how to facilitate the usage of Galileo in all domains. The concept is depicted in figure 2. The domain specific requirements have to be reviewed, transferred and consolidated to achieve acceptance of the certification by all domains. The certification of the Galileo system will focus on the SIS or might even include a reference receiver as a black box to provide an easier accessible interface for the certification of the applications. There still will be a lot of requirements specific in each domain resulting from the applications. Thus with a certification for Galileo SIS in place, dedicated certifications for aviation APV II (approach operations with vertical guidance)

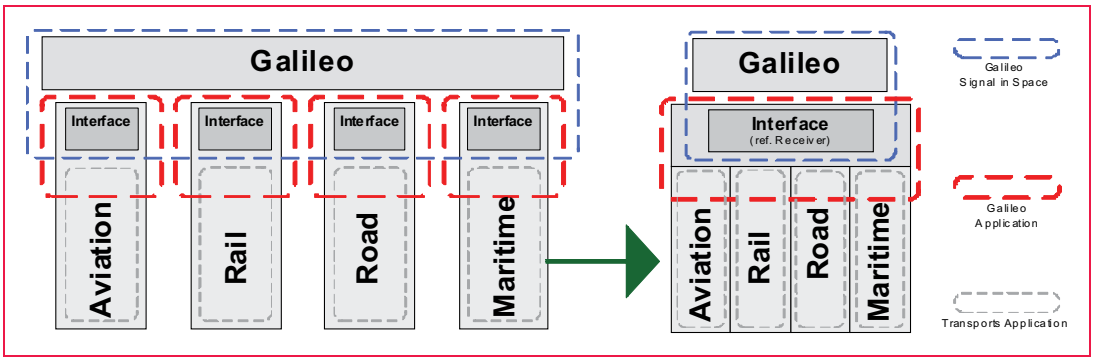

Figure 3: From application specific to multimodal certification
Source: GALCERT project funded by GSA, Brussels and managed by GZVB, Braunschweig

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Galileo update

ESA confirms SSTL's GIOVE-A full mission success

GIOVE-A, the first satellite in the Galileo satellite navigation system celebrates 27 months in orbit this month, marking the completion of its nominal mission lifetime. The European Space Agency (ESA) has confirmed that the pioneering Medium-Earth Orbit satellite is a "full mission success" and has contracted SSTL to continue operations for an additional year as the satellite continues to perform and provide valuable Galileo services. Under a 28M euros contract, the 660kg satellite was developed by SSTL for the ESA.

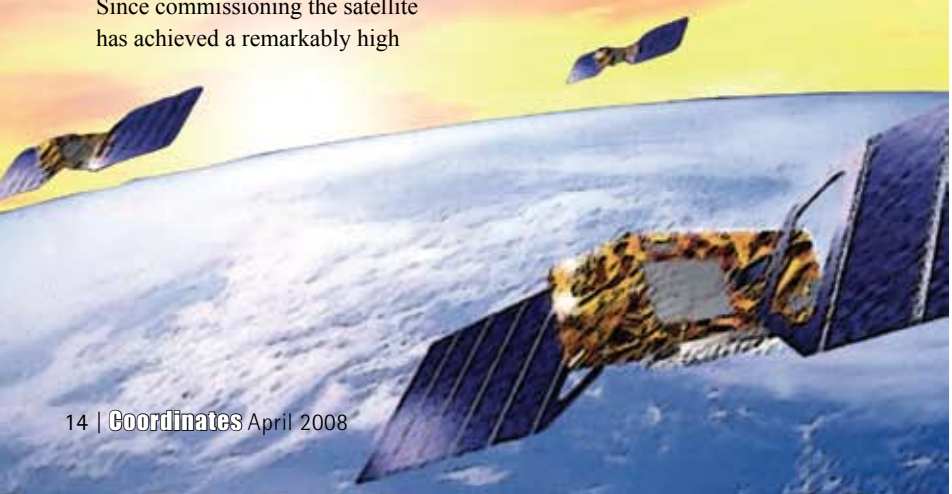
The primary mission was to secure the Galileo frequency filings at the International Telecommunications Union. The satellite also played a crucial role as a test-bed for the Galileo payload units, providing a representative signal-in-space for ground-based experimentation with Galileo signals and characterizing the radiation environment for the Medium Earth Orbit which will be used by all future Galileo satellites. Following successful launch and commissioning, the GIOVE-A team undertook an intensive six-week payload in-orbit test campaign using the 25m dish at the Science Technology and Facilities Council Chilbolton station. Through these activities ESA was able to claim the frequency filings three months before the license expired.

Since commissioning the satellite has achieved a remarkably high operational availability with signals being broadcast for 99.8% of the time over the last year. The primary atomic clock, fundamental to all future Galileo satellites in providing highly accurate positioning and time reference signals, has been operating continuously since June 2007. Thirteen sensor stations around the world are used by ESA to track GIOVE-A and GPS navigation signals and these have demonstrated that Galileo will be a highly accurate navigation system. *www.gpsdaily.com*

GIOVE-B ready for launch

The ESA says the GIOVE-B satellite will soon leave the ESA's European Space Research and Technology Centre (ESTEC) in Noordwijk, the Netherlands, where it is undergoing final preparations. It is scheduled to be launched into orbit from Baikonur aboard a Starsem Soyuz/Fregat launch vehicle on April 27. The second Galileo satellite has completed its pre-launch testing.

GIOVE-B will test novel, key technologies for the Galileo system, such as the high-precision passive maser clock and the triple-channel transmission of navigation signals. Instruments onboard the satellite will measure the radiation and spacecraft charging environments. Following on from GIOVE-B, the first four satellites of the operational constellation are under development. They are scheduled for launch in 2010 and will enable a system-level verification of the Galileo design.



or NPA (non-precision-approach) or for rail ETCS (European train control system) are required and will be applied for. It seems to be a more sophisticated scenario requiring suddenly two certifications instead of one and just adding complexity. Looking to figure 3 the advantages of this approach become obvious. Without a generic certification for the Galileo SIS each domain would have to include in their domain specific certification for any application all relevant components. They will have to ensure the reliability and availability of the Galileo system, validate the integrity signal and only thereafter can work on the requirements from their own application. The validation and verification of the Galileo SIS does not only increase the workload for the certification body within the domain but will also result in continuous efforts in all companies contributing to any phase of the Galileo system, like design, deployment, operation or maintenance. With the new multimodal certification approach these efforts are dramatically reduced for all engaged parties, as only for the Galileo SIS certification the suppliers of goods or services to the Galileo system have to participate and to provide the necessary information. Within a domain the efforts are reduced as during the certification process only the application specific requirements have to regarded based on the one time acceptance of the certificate for the Galileo SIS or for the interface of the reference receiver. Thus the new approach of a multimodal certification reduces the duration of a domain specific certification and perhaps more important reduces significantly the costs for the overall certification process. As risk and costs are reduced, products and services earlier available for market entry, this should result in total in a lower market entry level broadening the market for service provider and manufacturers.

Now coming back to the initial question if certification of the Galileo system is only driven by bureaucracy in the EU, one can say that the certification of Galileo SIS actually is a market enabler to allow more companies to profit with their services and products from Galileo. In total the end customer finally will have a wider range with lower prices to choose from.

Facing problems, finding solutions

Opening Plenary in Allerheiligen Hofkirche

THIS year more nations than ever before participated in the Munich Satellite Navigation Summit 2008 which was held from February 19th to 21st in Munich, Germany. Organizer Prof. Guenter W. Hein of the Institute of Geodesy and Navigation of the University FAF Munich welcomed 400 guests from about 30 nations in the "Allerheiligen-Hofkirche" (Court Church of all Saints). He compared the SatNav-Summit with a real summit in the Bavarian Alps. "From the top of a mountain you have a great overview and breath clean air", Hein said. He wished everybody that the Munich Summit could evoke something similar. "The difficulties might be not anymore as big as they were", he went on, "and perhaps there is a solution which comes up in an easy atmosphere".

The last year – concerning Galileo – was frustrating, Paul Verhoef (Director GNSS Unit, DG Transport and Energy, European Commission, Brussels) told the auditorium. The work still to be done by the EC is to fix the rules and modalities of the expenses. But the budget should no longer be subject of negotiations. Finalizing an ESA-EC agreement on the role of ESA as procurement agency is an important step to achieve full operational capability in 2013.

Etelka Barsi-Pataky (Member of the Committee on Transport and Tourism of the European Parliament, Rapporteur for Galileo) recalled that eleven years have past by since the first announcement of the Galileo program. But after overcoming the financial crisis in autumn 2007 she insisted on the defined sum of 3.4 billion € for the program.

Galileo back on track – Jacques Barrot speaks at the Summit

Jacques Barrot, Vice President of the European Commission in Brussels, summarized the problems Galileo had to cope with during the last years. After the PPP concept was cancelled, Galileo will be now exclusively financed on public money, thus the European Commission being now the manager of the project. The European Space Agency (ESA) will work for the EC, ensuring the integration of EGNOS and Galileo in order to become operational 2013. At the end of his speech Barrot expressed his hope that until the next Munich Summit "the Galileo dream will have come true". Read more about the Session with Jacques Barrot and other sessions: *www.munich-satellite-navigation-summit.org/Summit2008/DocumentationIndex.htm*

Sessions – Speakers – Space Night Feeling

The two traditional sessions called "GNSS Program Update" and "Munich flashlights – News from Bavaria" were followed by sessions with trend-setting titles like:

- Galileo Guarantees of Service and Certification
- Education, Research & Innovation in Satellite Navigation in Europe
- New GNSS Product and Service Announcements

Speakers from all over the world came to make the sessions a really extraordinary event with first hand updates from technical innovations, engineering changes, political measures and scientific troubleshooting.

For speakers and attendees there was enough time to network during the several coffee breaks and lunches. Each conference day closed with an evening reception.

See pictures of the Sessions and the Summit Space Night on: *www.munich-satellite-navigation-summit.org/Summit2008/D1Gallery1.htm*

Exhibiting in Royal Rooms

This year, the Summit Exhibition was early fully booked. This traditional exhibition gives 15 exhibitors the opportunity to show their products or work on certain projects. One exhibition area was built up in the foyer of the conference room "Max-Joseph-Saal", the second Area could be found in the historic "Theatinergang". The former royal summer residence made the exhibition a very kingly presentation.

Find more information about the exhibiton: *www.munich-satellite-navigation-summit.org/Exhibition.htm*

Next Munich Satellite Navigation Summit 2009 will be held from March 3rd – 5th, 2009. *www.munich-satellite-navigation-summit.org*

Heike Haas
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When GPS empowers rural youth

A collaborative programme between Department of Science and Technology and Nehru Yuva Kendra Sangathan.

Debapriya Dutta
Scientist"E", NRDMS Division,
Ministry of Science
and Technology
Government of India

ddutta@nic.in

NEHRU Yuva Kendra Sangathan (NYKS) , an autonomous agency under Ministry of Youth Affairs and Sports has the bounden duty to achieve the objectives laid down in the National Youth Policy. The advancement in the field of Science and Technology should be made available to the youth and to the community. As the adaptation of scientific and technological principles and developments, to maximize the use of local resources, are central to empowerment in the quality of life, the Policy recognizes the importance of emerging, modern technologies, particularly in the field of information technology and electronic media, in enabling the youth to perform and achieve in all sectors of their interest.

Considering the emphasis on technological self-reliance and development and adaptation of suitable technologies for local needs to make an impact on the lives of ordinary citizens (Technology Policy statement, 1983), the Government of India initiated a number of technology-based programmes to support the Local level planning in1980s viz. Natural Resources Data Management System (NRDMS) of the Department of Science & Technology, National Natural Resources Management System (NNRMS) of the Department of Space (DOS) and Geographical Information System (GISNIC) and District Information System (DISNIC) of the National Informatics Center (Ministry of Communication and Information Technology). Recognizing the changing context of the scientific enterprise, and to meet present national needs in the new era of globalization, the Science and Technology Policy, 2003 reiterates to ensure that the message of science reaches every citizen of India, man and woman, young and old.So that we advance scientific temper, emerge as a progressive and enlightened society, and make it possible for all our people to participate fully in the development of science and technology and its application for human welfare. Indeed, science and technology should be fully integrated with all spheres of national activity.

Considering the converging aims of the above policies, a collaborative programme ,"Empowering Youth through Geo-Informatics & Participation for Local Area Development (EYGIPLAD)" has been developed in collaboration between the NYKS and Natural Resource Data Management System (NRDMS) division of the Ministry of Science and Technology .

The goal of the programme is to enable

Zone	Organisation & Address	Selected district	Selected block	Selected village	Selected watershed
Northern	Department of Geography, Kumaon University, Almora Campus	Almora	Hawalbagh	Khunt	Khunt
Eastern	Jharkhand Space Applications Center (JSAC), Meurs Road, RANCHI	Ranchi	Ratu	Hochar	Upper Subernarekha
North eastern	North Eastern Regional Institute of Water and Land Management (NERIWALM), Dolabari, Tezpur, Assam	Aizwal	Lunglei	Theiriat	Theiriat
Northern	Department of Geography ,Mohan Lal Sukhadia University Udaipur, Rajas than	Udaipur	Sarda	Kantora	Kantora
Southern	Karnataka State Council for Science and Technology, Indian Institute of Science, Bangalore .	Kolar	Bangarpet	Venugopalpura	Venugopalpura

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www.trimble.com/proxrt

Household data collection

Field survey with GPS.

the youth to utilize the technologies of Geo-Informatics in local problem solving and build the capacity of the rural youth in modern technologies related to watershed management.

The objectives of the programme are:

i) To build up the technological capacity of selected volunteers of NYKS in Geo-Informatics for local problem solving related to natural resources & watershed management.
ii) To prepare spatial resource profiles of the selected blocks/watersheds.
iii) To develop an information generation mechanism focused on watershed management.
iv) To evolve an institutional mechanism for linking the activities to local level planning for sustenance.

Implementation mechanism

The project has been started as pilot in five locations in the northern, eastern, north-eastern, western and southern zones of the country. For this purpose, five blocks in different zones of the country has been identified which have NRDMS activities, under Rashtriya Sadbhavana Yojna (RSY) programme of NYKS and having developmental priority of the District authority. A model village under NYKS has been selected under each block and a watershed lying in the selected village has been chosen for the programme. The selected districts, blocks, watersheds and identified technical groups in different zones are as follows:

The programme is being implemented in two phases:

The first phase focuses on creating awareness among the volunteers in application of Geo-Informatics for local level development planning including hands-on training with a focus on watershed management technologies.

The second phase focuses on the implementation of a small project by the volunteers at the identified blocks.

Methodology

The methodology adopted is as follows:

- Identification of the block and model village and small watershed covering the village or beyond.
- Development of the training materials for awareness creation in Geo-Informatics and its application for watershed management.
- Training the volunteers in respective zones in the basics of Geo-Informatics and watershed management technologies.
- Training of the volunteers in participatory resource mapping.
- Collection of digital resource profile of the district at 1:50,000 scale.
- Development of digital resource profile of the selected village and watershed by the volunteers at 1:5,000 scale.
- Development of an integrated database for the block , village and watershed management.
- Application of NRDMS watershed management technologies to develop watershed management, block and village development plans by the volunteers.

Deliverables

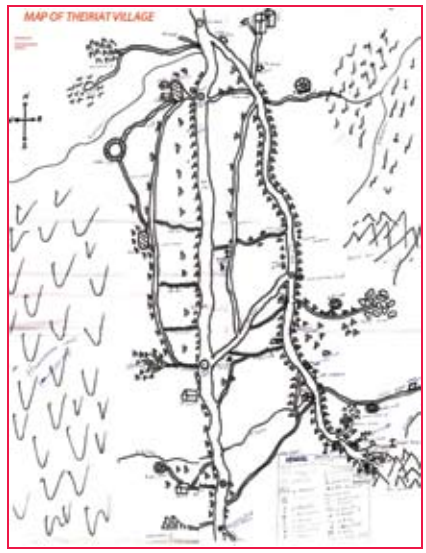
Followings are the expected deliverables:

- Number of selected volunteers whose capacity will be built up.
- Block , village And watershed level digital resource profiles.
- Information generating mechanism to address priorities local level problems focusing on watershed management.
- Institutional mechanism for sustainability of activities.

Outputs

Some of the outputs are shown below;

Route map prepared through GPS survey in Almora



A participatory mapping of the Theirait village, Lunglei.

"Mobile navigation is well on its way to being a truly global market, but not all players are aware of the extent of the opportunity"

Chris Jones, VP and Principal Analyst, Canalys

Bangalore | Taipei | Budapest | San Francisco

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www.canalysnavigationforum.com

BANGALORE: 13 MAY 2008

Are the Indian roads paved with gold for the navigation sector?

Topics include:

- The world wakes up to navigation
- Indian and APAC market outlook
- Converging devices globally and locally
- Consumer survey results for the Indian market
- Finding profit in the navigation value chain

TAIPEI: 15 MAY 2008

Local markets, global producers

Topics include:

- Taiwan and APAC market outlook
- Product development scenarios
- Consumer survey results for the Taiwan market
- The global opportunities for ODMs, and the barriers to overcome

BUDAPEST: 8–10 SEPTEMBER 2008

Locate, discover, explore, share

Topics include:

- Understanding the market dynamics of the EMEA region
- Finding profit in the navigation value chain
- Get connected – dynamic contents
- Business models – advertising, operators
- Differentiating PNDs
- Beyond navigation – LBS opportunities
- What navigation solutions will we be using in 2012?
- What impact is consolidation having?

SAN FRANCISCO: 14–15 OCTOBER 2008

Capitalizing on a high-growth market

Topics include:

- Understanding the market dynamics of the Americas region
- Finding profit in the navigation value chain
- What navigation solutions will we be using in 2012?
- What technology will be in next-generation navigation solutions?
- How does the channel value mobile navigation?
- What are the prospects for GPS navigation in Latin America?
- How will LBS develop beyond navigation?

An inside view of the Canalys Navigation Forum from Rachel Lashford, Canalys' APAC Manager

Rachel Lashford joined Canalys in September 2000 and leads the company's Singapore operation, which opened in October 2006. She runs the Smart Mobile Device Analysis Worldwide and APAC services, and contributes analysis on mobile devices, mobile navigation, vendor and operator channel strategies, mobile applications and content.

Tell us the idea behind the Canalys Navigation Forum and its objective.

Canalys has leading industry analysts in the field of mobile navigation and smart mobile devices. We were the first company to deliver quarterly tracking and regular analysis on the mobile navigation market globally, and our client list reflects how we have continually built up the quality and depth of our research in this sector. This commitment to, and from, the industry, has made us best placed to introduce an independently run event around what is one of the fastest growing consumer electronics sectors in the world. Our first event two years ago was the foremost of its kind to draw in as sponsors the critical players in this ecosystem, bringing senior executives from across the industry together to discuss and analyse the future direction of the market. The purpose of all of the forums is to bring the companies involved together, with the idea of cooperation and 'coopetition', to gain invaluable market insight locally and globally. Naturally, networking, making a wide range of new contacts and promoting their own businesses is also an important factor.

What prompted you to choose Bangalore, Taipei, Budapest and San Francisco as the venues of your events?

We spend a lot of time and resources on finding the perfect venues – we, and our delegates have extremely high standards! Bangalore for us represented perfectly the success of twenty-first century India – a burgeoning IT industry and a brand new airport and metro on its way being the key indicators. Of course Bangalore also epitomises some of the challenges, especially for the emerging navigation market, including of course the traffic problems! Taipei is the hub for much of the navigation market's manufacturing industry, so we know there would be a keen interest there to hear about not only the Taiwanese market, but also the high-growth opportunities elsewhere. Budapest, capital of Hungary, is part of another new area of potential growth – Central and Eastern Europe. The US decision was less difficult for us, as we have recently opened our Americas office in the Bay area, and of course Silicon Valley is home to many of our sponsors and attendees.

What is your target audience for the forum?

All of the forums are a meeting place for C-level and senior executives within the mobile land navigation sector. Mapping suppliers, hardware and software vendors, operators, ISPs, channels, venture capitalists, investment analysts, as well as press will all attend.

Could you share some of the highlights and successes of the Canalys Navigation Forum in Geneva in 2006 and Barcelona in 2007?

We've enjoyed welcoming the CEOs of Navteq, Tele Atlas and TomTom to speak at our events in the past, and been privileged to have some major players as sponsors, and had over 300 attendees at each European forum. But I have to say this year's events look bigger and better than ever, not least because of the global reach. The forums' premier sponsors across the events to date have included, among others, Nokia, Tele Atlas, Navteq and TomTom. We also welcome new sponsors this year, including Microsoft, Nav N Go, Wayfinder and MapmyIndia. Our speakers and panellists will include operators, car manufacturers, ISPs and even a top advertising agency, so that attendees can get a breadth of opinions.

What according to you is the growth opportunity for the navigation industry in the APAC region?

The APAC region is the next fastest growing after North America, with Q4 2007 shipments of around 1.7 million mobile GPS navigation devices representing a 137% rise on the equivalent figure in Q4 2006. So not only is the region experiencing a high level of growth, but it remains a very fragmented area to understand and tackle – there are dramatic contrasts between APAC and the other regions. For example, while the PND is still the largest category in volume terms, PMPs (portable media players) and converged devices, such as smart phones, already represent more than 20% of the market.

Both of our APAC forums will be important for those who wish to succeed in selling navigation and location solutions into this huge potential market. These events will also include information on consumer preferences for India and Taiwan – drawing upon the results of special consumer surveys Canalys is conducting for each of the events.

How do you define the contribution of the Canalys Navigation Forum to the growth of the navigation industry?

We aim to contribute by establishing the premier independent meeting place for those individuals involved in the industry in each region. Unlike a trade show floor, attendees will have the time and the space to focus on discussing the market and considering the future impact on their businesses. Some will have an interest in understanding and accessing the local market and others will be there to inform decisions on product development and branding decisions for foreign markets. All will no doubt appreciate the independently researched data and opinions presented by Canalys.

Canalys Navigation Forum will span the globe in 2008

Make the most of the opportunities available to you by joining industry experts at **Canalys Navigation Forum 2008** as they evaluate the risks, benefits and solutions of navigation and other location-based services (LBS).

The hugely successful forum is developing as fast as the market it focuses on and will take place this year in India, Taiwan, Budapest and San Francisco. Wherever you are based, and whatever your company's role in the industry is, you need to be at these events.

Don't just take our word for it:

"This kind of an event gives the opportunity to all participants in this emerging industry to share opinions, voice opportunities and last but not least to meet each other."

Alain De Taeye, CEO Tele Atlas

"This conference is a testament to the fact that navigation is an industry in its own right. The penetration of navigation products across a spectrum of business and personal applications is impressive."

David Assouline, Marketing Director, Consumer of NAVTEQ

Our truly interactive forums will provide you with all the answers to your questions on mobile navigation and the broader LBS market, with a variety of interactive learning and best practice sessions, such as: presentations, Q&A discussions and one to one networking opportunities with the industry's most respected visionaries.

More information regarding these events will be released regularly over the coming months. Please visit our web site at **www.canalysnavigationforum.com** to find out more.

About Canalys

Canalys specialises in delivering high-quality market data, analysis and advice to the world's leading technology vendors. It is recognised as a key provider of continuous advisory services and confidential custom projects for marketing managers and strategists within blue-chip IT, telecoms, navigation and consumer electronics companies. It has unrivalled expertise in routes to market for all kinds of high-technology products and services in the consumer, SMB and large enterprise segments, and provides worldwide market data and trends analysis.

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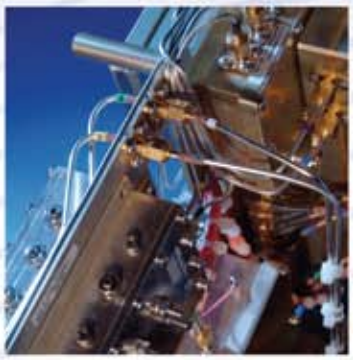

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Is Indian NSDI an example to follow?

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The paper is an academic analysis of the brief history of Indian NSDI. While the NSDI workshops appear to have taken note of and made recommendations in respect of different aspects in the NSDI Technology-Stakeholder continuum, several of the issues have been addressed over the past years in some measure. As it is well-known, standards and technology play a vital role in the operatinalisation of NSDI concept. Although there has not been adequate investments made from the Private Sector for sharing their data assets in the past years, there have been indications of bussiness opportunities for the Industry in contrubting to the setting up of SDIs with sizeable public sector investments. Delhi State SDI is a step in this direction. On the request of the Industry, setting up of a National Geo-spatial Regulatory Authority is under active consideration of the Government. Unlike the developed nations where SDIs start from spatial data nodes, various data providing organisations in India are only recently coming up with operational scale network-accessible spatial data nodes.

Editor

SPECIAL characteristic of spatial data is that it can be shared and used for many other purposes than the one, for which, it was originally produced. To facilitate its efficient sharing and reuse, it needs to be properly managed in the form of infrastructure i.e. Spatial Data Infrastructure (NSDI). This is one of the reasons that many countries are developing National Spatial Data Infrastructure (NSDI). But the challenge of developing a successful NSDI depends largely on its implementation which is so significant that none of the two key stakeholder groups i.e. public or private sectors can address it at their own. Therefore, if efforts are made to implement such initiatives by only one of the key stakeholder groups then the result may be partially if not totally failure to get the tangible benefits truly intended from such initiatives. As an example, Indian NSDI is explored in this context.

Indian NSDI is not new to the spatial community as it was initiated eight years ago. During these eight years it has gone through different phases i.e. conceptualization to implementation. A lot has been written and is still being written by the spatial community about the Indian NSDI. This paper explores overall trajectory of Indian NSDI up till now. It is believed that tracking Indian NSDI trajectory would be helpful for countries such as Pakistan which are in the initial process to start such initiative.

How and by whom Indian NSDI was conceptualized?

The task force which envisioned NSDI was composed of geographers, scientists, GIS experts, administrators, mainly drawn from survey, mapping, remote sensing, and the Indian space organizations (ibid., p.Tf.1). Strategy and action plan for Indian NSDI was launched at a workshop held in New Delhi from 5th to 6th February 2001 which briefly explained vision of Indian NSDI.

Statement of 'The NSDI Vision' is, "National infrastructure for the availability of and access to organised spatial data use of the infrastructure at community, local, state, regional and national levels for sustained economic growth", (NSDI-Strategy and Action Plan 2001, p.6).

A letter to NSDI Task Force from Department of Space describes, "… technical agreements, standards, metadata definitions, network and access protocols will it be easily possible for the NSDI to come into existence", (NSDI-Strategy and Action Plan 2001, p.4). Similarly in another letter, it is stated that, "There is a widespread consensus, internationally, that spatial data sets need to be integrated to create what is called a geo-spatial data infrastructure. Such infrastructures have been linked to information high-ways, linking a variety of databases and providing for the flow of information from local to national levels and eventually to the global community" (DST 2001, p. 5, foreword by Secretary, DST). Also in another letter market place is the focus of potential NSDI, "In the emerging market-place, geographic or geo-spatial information occupies a preeminent position", (DST 2001, p. 5, foreword by Secretary, DST). Puri, Sahay and Georgiadou in a paper presented in GSDI-9 conference at Santiago, Chile in 2006 take note of this borrowed concept and say, "…….the approach adopted to the setting up of the NSDI in India, focusing particularly on how it has been inspired by the "superhighway' and "marketplace" metaphors".

What were elements of Indian NSDI?

A research was carried out in 2004 by Georgiadou, Puri and Sahay, "To understand the perspectives of stakeholders involved in the planning, implementation, and eventual end use of the proposed NSDI", (Georgiadou et al. 2005,p.1117). They note that "The key elements identified for development of NSDI were: standards (to allow interoperability; standards for networks, gateways, protocols, software, etc.), evolving metadata, nodes (GIS-based spatial database servers), search and access protocols, electronic clearing house, creating user interfaces, and initiating an NSDI outreach and awareness programme", (Georgiadou et al. 2005,p.1118). Looking at the elements, one can find that except "an NSDI outreach and awareness programme" rest of the ingredients of Indian NSDI were purely technology biased. More over, partnership element is missing. According to Katleen et al. (2006, p. 1) , "The development of a spatial data infrastructure (SDI) not only comprises technical aspects, but also is supported by economic, social, organizational and legal measures", (Katleen 2006). Keeping in view the aspects defined by Katleen et al. following elements appear missing or were not in place, i.e. economic, social, organizational and legal. Puri et al. (2006, p. 6) quotes statement of a senior executive working in large private sector organization who expressed his disenchantment in the following words: "NSDI was conceptualized and is being implemented by the government, for the government, within the bureaucratic framework of the government… We would not participate in NSDI unless it is established outside the pale of the government, and functions as an enlightened, independent body". This and other statements quoted above speak of lack of private sector participation in Indian NSDI. Realizing the power and usefulness of innovative approach i.e. Public-Private Partnership (PPP), Indian Union Minister for Science and Technology Kapil Sibal in his statement published on the website of a magazine, GIS Development on 20th February 2007, said that there will be just a few restrictions on the use of data. And "This (the project) will be rolled out through public-private partnerships (PPPs)", he added. http://www.gisdevelopment.net/news/viewn.asp?id=GIS:N_npqesowhvy).

Puri, Sahay and Georgiadou conclude, "… in a state controlled domain where the private sector has literally had no role to play until recently, and where the use of maps is not historically evident (Sahay & Walsham 1997), the assumptions of a marketplace approach remain in contradiction with the historical realities on the ground", (Puri et al. 2006, p. 6). This supports the fact that users and private sector were not considered in Indian NSDI. Simply said it was not based on PPP because in PPP, public organizations, private organizations, NGOs, academia, and citizens all are included. Masser also showed concerns about Indian NSDI in an article published on website (http://www.gisdevelopment.net/policy/gii/gii0009pf.htm) of GIS Development, a magazine from India. He doubts inclusion of all stakeholders, "The proposed National Geospatial Data Infrastructure is a major step forward for India. Its implementation will require the active involvement of all the geographic information stakeholders", (Masser 2004). Recommendations made by the delegates during the NSDI-VI workshop held at Goa during 28-29 June, 2007 clearly reflects exclusion of private sector in Indian NSDI as published on website (http://www.mycoordinates.org/) of a monthly magazine "Coordinates" in its July 2007 issue. One of the recommendations was to "Recognize that the datasets generated in the private sector have got potential for many applications and thus be made part of NSDI metadata. The private industry should quickly come forward to populate the metadata as per the standard of NSDI which will reduce duplication of efforts".

Table1: Key features of the Indian NSDI (Source: Georgiadou et al. 2005, p.1124)

Learning from the domain of information infrastructure	As applied to the Indian NSDI
Installed base and lock-in effect	Installed base recognized, but no clear strategy exists of how it would form the basis of the NSDI. Lock-in created by diversity of maps, other spatial sources, and institutional issues not addressed.
Reflexive standardization	Standardization process mired in scientific thinking. Developing a 'hierarchy' of standards reflexively and as a negotiated process not in evidence.
Cultivation approach to design	Top-down, 'constructionist' approach evident at present, data-centric focus, end users not involved in determining their perceived needs, inculcation of bottom-up approaches also not considered; visions of 'grand' design.

Which stakeholders were considered?

It is also important at the outset to identify some of the most important players or stakeholders with interests in geographic information and spatial data infrastructure matters (Masser, 2005). These most important stakeholders are: central government organizations, local government organizations, commercial sector (such as data producers, brokers who add value to core datasets, publishers, hardware and software vendors etc), NGOs, academia and citizens.

Indian NSDI has sixteen stakeholders and they are all national agencies according to the website (http://gisserver.nic.in/nsdiportal/gotogos.jsp). Puri et al. (2006) finds that the users have been almost totally neglected during the NSDI design. The attitude of public sector organizations is stated in an article published on 19th Feb 2007 in The Times of India in these words, "Getting information out of government is a bit like getting blood from a stone". Private sector also suffered

the same as they were also not involved in NSDI development. Where as a strong private GIS market exists in India mentioned by science and technology minister Kapil Sibal in a statement published by The Times of India on 19th February, 2007. The minister said in his statement, "in any case, there are already 200 firms in the GIS business in India". As a result later on Indian NSDI faced serious difficulties at implementation stage which caused significant delay in getting tangible benefits from it. Establishment of National Spatial Data Committee (NSDC) in 2006 further strengthened grip of Indian bureaucrats instead of social sector, end users and private GI sector organizations over Indian NSDI. The role of NSDC as stated by Coordinates in its July 2006 issue is, "The NSDC shall be the apex national authority for formulating and implementing appropriate policies, strategies and programmes for the establishment, operation, management of the NSDI and utilistation and any other activities related to spatial data in the country". The committee is totally void of private sector membership. The National Spatial Data Committee (NSDC) constituted with the members all belonging to public sector organizations as reports the website http://www.mycoordinates.org/indias-nsdi-july06-1.php.

The exclusion of end users also made it impossible to bring social aspects of NSDI in the terminology of Georgiadou 'Social SDI' and it became a 'technical SDI'. About the exclusion of state governments, the then Surveyor General of India in the July 2006 issue of Coordinates (http://www.mycoordinates.org/indias-nsdi-july06.php) said, "The other area of concern is to involve state governments. We need to think how to get them on board through state level SDI". And "Although major data producing agencies are at central level but at micro level most of the datasets are with the state governments" he further added. He also realized the difficulties of implementation saying that, "The challenge as Member Secretary is the implementation of an action plan within a given timeframe". In the February 2006 issue of GIM International (http://www.gim-international.com/issues/articles/id614-Multilevel_Implementation_of_SDIs.html), Masser writes, "Many national SDI documents seem to abide by the principle of 'one size fits all'; they suggest that the outcome of SDI implementation will lead to a relatively uniform product…… National SDI strategies drive state-wide SDI strategies and state-wide SDI strategies drive local-level SDI strategies".

Therefore, participation of local stakeholders i.e. states, end users, private sector GI organizations, academia and NGOs is very crucial for implementation of an NSDI. As most detailed database maintenance and updating tasks are carried out at local level, the input of local government has a considerable impact on SDI implementation at state and national levels, (Masser 2005). In the August 2007 issue of Coordinates (http://www.mycoordinates.org/nsdi_august2007.php) Mukund Rao former president GSDI also showed his concerns about participation of few stakeholders in Indian NSDI in these words, "….was driven by a few individuals for success and benefit in the country".

He also underscores the need of PPP for NSDI in these words, "Another major amalgam for NSDI is Public-Private partnerships – it would be just impossible for a single entity (even government) to fully establish the NSDI on its own. Partnerships will have to be the core mechanism to make NSDI successful."

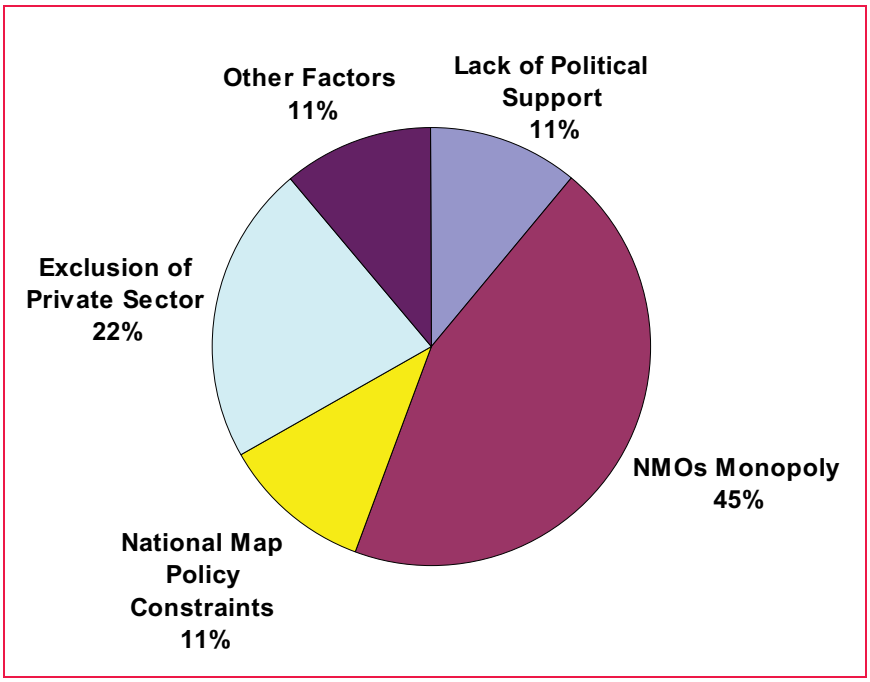

Figure 1: Current state of Indian NSDI and related factors

How was Indian NSDI implementated?

NSDI implementation is a complex process. In addition too many stakeholders in the game as is the case of Indian NSDI make it more complex. The gravity of the situation increases further when major players are not included such as private sector and end user groups which is true also in Indian case as Georgiadou et al. (2005) also finds, "The Indian NSDI shows little evidence of systematic interaction between its developers (the scientific institutions) and potential end users (for example, district administration) to understand their information needs", (p.1123). There is no much evidence of any partnership arrangements including PPP though "PPP" is there on papers of Indian NSDI workshops and in the statements given by Indian ministers to the print media. To quote an example, science and technology minister Kapil Sibal said in a statement published by The Times of India on 19th February, 2007, "The government proposes to make all this information available through public-private partnerships". Indian

Table 2: Important points and some of the recommendations of Indian NSDI workshops

NSDI Workshop	Important Points/ Recommendations
1st Workshop at New Delhi (February 5-6 2001)	Standards are the crux of the NSDI…… Academia and research community, providing the research and technology development backbone for NSDI Source: NSDI-Strategy and Action Plan 2001, pp.20-21
2nd Workshop at Tamil Nadu (July 29-31,2002)	All organisations, institutions and persons in the public or private sector having spatial data assets which can conform to NSDI standards must be encouraged to participate in NSDI. The private sector is seen as a partner in the NSDI initiative and its role is envisaged as providing IT solutions, services, human resources development and infrastructure, as also for committing its own data assets to such an infrastructure. Source: http://www.mycoordinates.org/nsdi-india1.php
3rd Workshop at Agra (November 12-14 2003)	The National Map Policy must be formalized at the earliest and its operational implementation taken up. An assessment of any consequential impact of the National Map Policy on NSDI and its activities must be made and solutions enabled by the NSDI Task Force. Source: http://www.mycoordinates.org/nsdi-india2.php
4th Workshop at Lucknow (November 17- 19 2004)	Agencies from the government, private and non-government sector - who have spatial data assets and solutions are urged to integrate their efforts and participate in NSDI. It is recognized that private sector would be the main source for SDI technology, solutions and services - which would be the backbone for NSDI. Source: http://www.mycoordinates.org/nsdi-india3.php
5th Workshop at Hyderabad (December 18 – 20 2005)	The workshop mainly stressed upon the policy and technical issues. The private industry should quickly come forward to populate the metadata as per the standard of NSDI which will reduce duplication of efforts. Position policies and structures for NSDI to evolve a systematic public-private partnership. The possibility of NSDI as autonomous independent agency from the government stake holder agencies which can independently evolve a business model for NSDI needs to be explored Source: http://www.mycoordinates.org/ conference-nsdi-feb-06.php
6th Workshop at Goa (June 28-29 2007)	Director General of Forest Survey of India, Dr Devendra Pandey said that, our technology is our biggest strength and specially our remote sensing capabilities are one of the best in the world. The delegates note that all elements (technical and agency-level efforts) for the NSDI…… The ultimate-success of NSDI will be when citizens and Society will benefit from the usage of NSDI Services. Source: http://www.mycoordinates. org/need_magic_wand.php

NSDI followed top-down approach termed as "construction approach" by Georgiadou giving it bit mechanical meaning. According to her, "The top-down approach is required to specify a strategic goal and vision, prioritize plans, arrange core funding, contribute to the definition of fundamental datasets, build a clearing house, develop metadata standards, and resolve information policy issues", (Georgiadou et al. 2005, p.1123). Simply said it revolves around planning and lacks in implementation terms as implementation is more encouraged by bottom-up approach because implementation requires local participation which is present in bottom-up approach according to Georgiadou et al, "The bottom-up approach aim to promote various local initiatives"…, (Georgiadou et al. 2005, p.1123). Therefore, adoption of top-down approach in addition to the exclusion of key stakeholder groups like private sector, academia and NGOs made successful implementation of Indian NSDI a dream instead of reality.

What has been the over all trajectory of Indian NSDI?

A questionnaire was designed and distributed via e-mail to get input from individuals of public and private GI sector organizations in India. The questionnaire response rate was 60%. Some of the respondents sent very detailed e-mails in addition to questionnaire reply in the context of Indian NSDI. It indicated keen interest of individuals both from public and private GI sector of India regarding NSDI. Most of the respondent i.e. 45% individuals declared monopoly of national mapping organizations (NMOs) as the main reason for current state of Indian NSDI. 22% respondents were of the opinion that Indian NSDI suffered due to exclusion of private sector where as 11% individuals considered national map policy the major bottle neck in successful implementation of Indian NSDI. The same majority i.e. 11% attributed current state of Indian NSDI to lack of political support while remaining 11% respondent considered it due to other factors such as noninvolvement of NGO and academia etc. The result of the survey is displayed in figure 1.

Workshops arranged by coordinating body of Indian NSDI also help to understand path followed by Indian NSDI. The following table (Table 2) summarizes the important points and some of the recommendations of Indian NSDI workshops held so far in order to have a brief view of Indian NSDI initiative as perceived by the NSDI coordinating body.

Arguments made up till now covered some important aspects such as important elements, stakeholders, partnership arrangements and implementation strategy

of Indian NSDI. Therefore, starting from vision statement in 2001 to last NSDI workshop held at Goa in 2007, marks the trajectory of Indian NSDI.

From above figure it is concluded that the overall trajectory of Indian NSDI development has been:

i) Launch of Indian NSDI by national mapping organizations (NMOs) along vertical hierarchy axis (authority) instead of floating it from horizontal axis (ground realities) gave it power of minorities (officials) and not power of the majority (masses). Consequently, it started to decline soon after wards.
ii) Initial focus on technology instead of beneficiaries of this technology such as citizens further brought the projectile (Indian NSDI) down to the ground.
iii) Non-involvement of private sector thought it was realized strongly in the recommendations of 2nd NSDI workshop added to the inertia faced by Indian NSDI
iv) National map policy constraints played its role to pull the projectile down to hit the ground
v) Neglecting role of NGOs hindered to bring local knowledge and community support to the initiative
vi) Lack of partnerships such as Public-Private Partnership (PPP) gave monopoly to national mapping organizations (NMOs) which are usually good in making policies but lack in implementation of policies
vii) Top down approach instead of bottom up approach to implementation NSDI due to noninvolvement of end users such as citizens caused the Indian NSDI move partially failure if not totally.

Conclusion

The overall trajectory of Indian NSDI development has been, initial focus on technology instead of beneficiaries of this technology such as citizens, non-involvement of private sector, outdated national map policy, neglecting role of NGOs, lack of partnerships such as PPP and top down approach.

Recommendations

Countries such as Pakistan which are in the processing of initiating NSDI move, should not follow exactly the same trajectory as of Indian NSDI but floating it with the inclusion of all key players of NSDI such as private sector, public sector, NGOs, research and teaching institutions, and media etc.

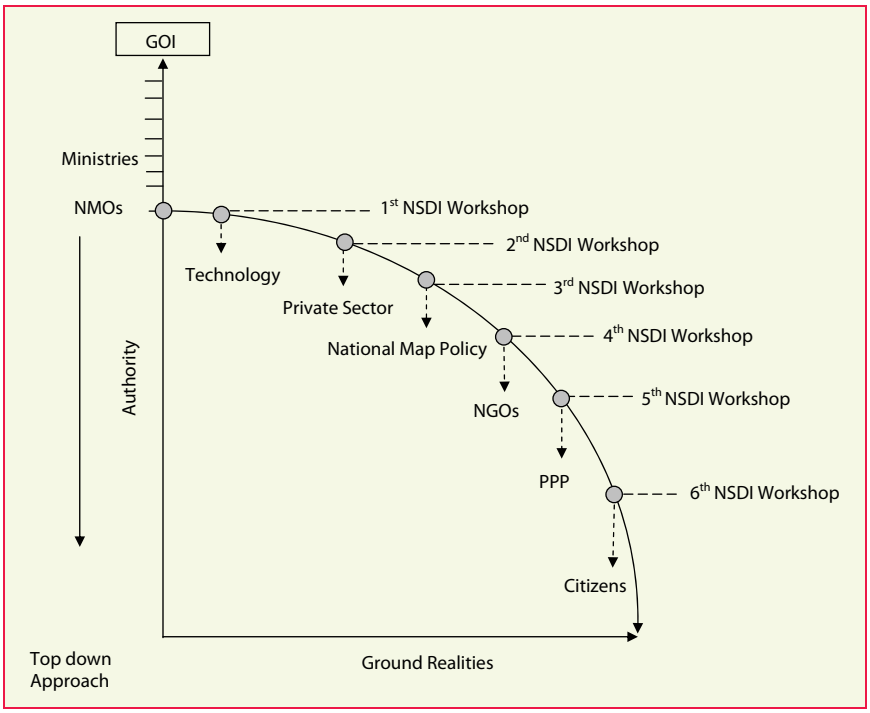

Figure 2: Trajectory of Indian NSDI

Reference:

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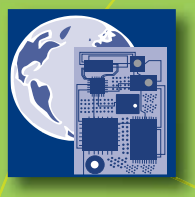

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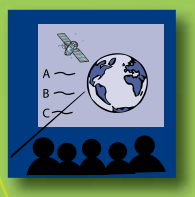

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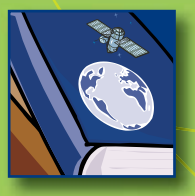

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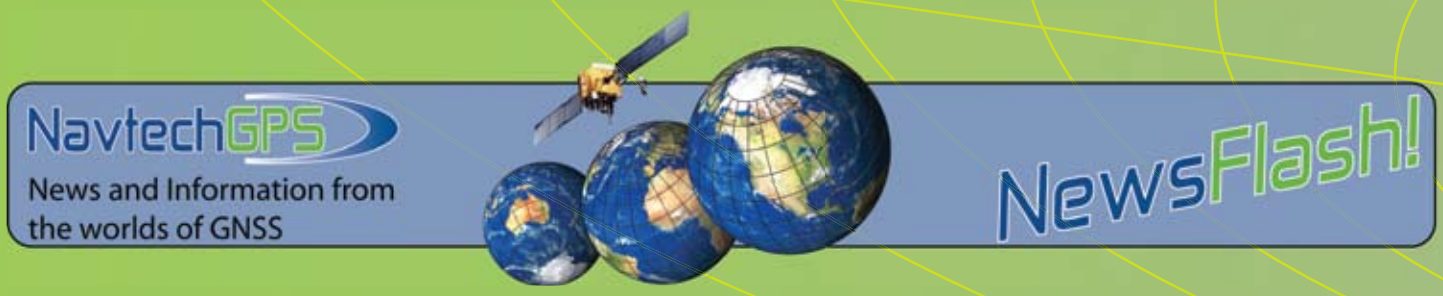

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3D-Laser Scanning possible up to 2000m

RIEGL has recently launched 3D laser scanner LMS-Z620, especially optimised for long range topography and mining applications. It is providing a maximum measurement range of 2000m on natural targets and a reduced beam divergence of just 0.15 mrad, performance data which are unrivalled in the market of high-speed laser scanners. It has RiSCAN PRO´s backsighting and Multi Station Adjustment functionality as well. *www.riegl.com*

SOKKIA introduces Windows Mobile® application GSR NetLink

SOKKIA has introduced GSR NetLink software that enables to communicate RTK data between GNSS receiver and reference networks via Windows Mobile® Pocket PC phone technology. It operates with either GSM or CDMA wireless communications networks, offering complete flexibility for survey areas that are covered by a specific protocol. It also provides a wireless solution when paired with the dual-Bluetooth® capable GSR2700 ISX.

Geokosmos plans office in India

GEOKOSMOS International, is planning to set up a liaison office in Delhi to primarily engage in general business development within the aerial photography and mapping industry. “India is a potential market and we too are looking forward to building relations with business partners and clients there,” said Geokosmos VP, International Business Development, Peter Goellner. The Economic Times, New Delhi

Aftek mining solutions

Aftek's MLS provides a cutting edge technological solution for Open Pit mines. Using wireless communication and GPS it provides automated dispatching of vehicles. It also provide online tracking of equipments, reduced idling time of equipments, instant breakdown information, increased productivity and quicker ROI. *www.aftek.com/mining*

ASUS PDA phones enabled with SatGuide ONE INDIA integrated map!

ASUS PDA phones has a tied up with SatNav Technologies. Consumers who buy, P750 and P527 phones, which have in-built GPS receivers will come pre-loaded with ONE INDIA integrated map from SatGuide.

GNSS Mapping and GIS Solution by Trimble

Trimble has introduced the GPS Pathfinder® ProXRT receiver. It combines GPS receiver with Trimble® H-Star™ technology, OmniSTAR correction capability, and optional GLONASS capability to provide submeter to decimeter accuracy. The receiver is ideal for high-accuracy mapping, data collection, and asset management applications in industries such as water/wastewater, utilities, telecommunications, transportation etc.

Trimble has also completed the implementation of GIS-based UtilityCenter® uaFM™ information technology module for TECO Peoples Gas, which is Florida’s leading natural gas provider. *www.trimble.com*

Mio C230 car navigation system wins prestigious iF design award

Mio Technology’s C230 car navigation system has been awarded the prestigious 2008 iF Design Award in the Audio/Video category. It is a PND designed for entry-level users.

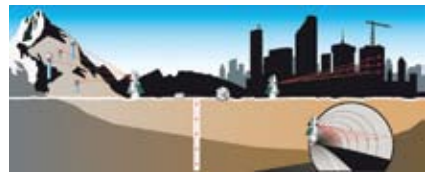
GeomaticaX and GeoCapacity by PCI Geomatics India Pvt. Ltd.

PCI Geomatics’ is offering GeomaticaX (production oriented automated workflows) and GeoCapacity (systems designed to manage and provide data/maps/information ‘on-demand’). It can provide a scalable enterprise solution for effective management, processing and distribution of information derived from Earth Observation data.

Safe software adds new dimensions to Spatial ETL

Safe Software has released FME 2008. It includes FME Server, a scalable solution for data transformation and distribution, as well as a new version of FME Desktop, the recognized standard in spatial ETL (extract, transform and load). *www.safe.com.*

LEICA Geosystems offerings – Choke Ring Antenna, SpiderWeb and GeoMoS 4.0



Leica AR25 is the new choke ring antenna from Leica Geosystems covering all present and currently planned GNSS constellations and signals, including L-Band (SBAS, CDGPS and OmniStar). Leica has also released a new version of Leica SpiderWeb which is an advanced solution for presentation and distribution of GNSS data sets from any network to individual users via the internet. It has also released Leica GeoMoS v4.0 which is the latest update to GeoMoS, an open, scalable and customizable software suitable for a wide range of monitoring applications. New version unites the geodetic and the geotechnical world. It also supports Campbell® Scientific dataloggers. *www.leica-geosystems.com*

Intergraph evolves its solutions

Intergraph's new design and asset management software now supports Oracle Locator. The software integrates geospatial data with corporate systems such as work management, outage management and network analysis to fully support planning, design, construction, operations, maintenance

and emergency response functions.

MapQuest teams up with INRIX for Traffic-Enabled Navigation Solutions

MapQuest and INRIX has announced a collaboration that will allow consumers and businesses to access the full breadth of INRIX traffic information across multiple MapQuest business units - MapQuest.com, MapQuest Wireless, and MapQuest Platform Services. *www.gpsbusinessnews.com*

Garmin claims number one position on the PND market

Garmin has claimed that it is the global leader in PND sales, having sold more than any other manufacturer in 2007 as per the research provided by Canalys, market analyst firm. *www.gpsbusinessnews.com*

ESRI Joins NAVTEQ developers platform

NAVTEQ has announced the addition of the ESRI Zone within the NAVTEQ Network for Developers (NN4D) development program. ESRI, a GIS software leader will provide NN4D developers with access to a comprehensive environment for rapid application development, tools, documentation and support. *www.gpsbusinessnews.com*

Mio releases Moov auto GPS systems

Mio has released 3 automobile navigation systems Moov 200, Moov 330 and Moov 370. Main upgrades common to all include MioMore software that allows moving points of interest back and forth between a computer and the unit as well as SIRF's InstantFixII GPS receiver for quicker finding of satellites. *www.electronista.com*

Magellan brings wide screens, traffic to RoadMate

Magellan has unveiled three new additions to its RoadMate series of PNDs. The base model of the series, the RoadMate 1400, comes preloaded with Navteq road maps. It also comes pre-loaded with a database of European safety cameras, which provides locations of known cameras for each region. *www.magellangps.com*

Toyota creates new integrated Portable Nav System for Yaris

Having just introduced a new OEM headunit that features integration with a TomTom handheld GPS system, Toyota's European division may just have started a new revolution with its new Yaris. When the handheld TomTom is docked in the dashboard, the system charges and operates as an integrated navigation system. *http://car-reviews.automobile.com*

u-blox GPS powers LandAirSea GSM-based tracker

LandAirSea Systems, announced the launch of a battery-powered, GSM-based real-time vehicle tracking unit featuring u-blox 5 GPS technology. *www.sunherald.com*

Infotech Enterprises, India inks multi-year pact with Tele Atlas

Infotech Enterprises has signed a new multi-year contract with Tele Atlas to provide extensive map database and software development services. Through the agreement, Infotech's database teams shall assist in the production of Tele Atlas' digital map database. *www.stockwatch.in*

German radar satellite generates precise traffic information

TerraSAR-X The German Aerospace Center (DLR) has begun several months of tests to obtai traffic information via its new radar satellite. It is going to monitor selected sections of motorway in Europe and in the USA. It aims to develop a procedure for large-scale traffic data capture, independent of ground systems,that permits data relay to various traffic information providers. *www.gpsbusinessnews.com/*

Contex's new large format imaging solutions

Contex has recently released professional wide format scanners. With its technological and stylistic enhancements, the product suite boasts even greater image quality and flexibility. Easily integrated with most wide format printers, the scanners enable users to create visually unified, multi-function copying and printing solutions. Contex has upgraded the optical resolution from 508 dpi to 600 dpi. "600 dpi is the highest true optical resolution specification in the large format scanning industry today," says Niels Appel, Executive VP, Sales and Marketing for Contex operations. "Optical resolution is a key indicator of image quality – and we are very pleased to offer our customers this industry-leading capability."

TerraPOS Precise Point Positioning

TerraPOS is the GNSS post-processing software capable of accurate positioning without the use of reference stations or DGPS services. Reference stations are made obsolete by employing precise satellite orbits and satellite clock corrections coupled with state-of-the-art error modeling.

It is specially developed for kinematic applications, such as airborne photogrammetry or LIDAR operations, seabed mapping, or seismic surveying.

TopoSys virtually eliminates calibration flights for aerial LIDAR surveys

TopoSys has virtually eliminated the need for calibration flights or "Boresighting" for aerial LIDAR surveys with their line of LiDAR sensors which are highly stable, completely integrated, turn-key systems of IMU, GPS, LIDAR sensor and digital imaging systems.

"Calibration" and "boresighting" are two terms for the process to determine the offsets between the IMU coordinate axes and the Lidar coordinate axes.

Blue Marble to offer tracking service for public pay phones

Blue Marble Geographics has announced a new service, GPS tracking for pay phones. With this new technology enterprise,

users are able to receive up-to-the-month updates of the coordinate position, spatial whereabouts, barometric change, and amount of loose change in the change return slot. The Premium Service level will supply change detection in the graffiti located on the pay phone windows.

Chaos systems AB releases Mapsuite+ 6.0!

Mapsuite+ 6.0, the CAD software for surveying, mapping and design has now reached its 6'th version, with a lot of new enhancements for the surveying and mapping people. It includes new CAD functions like Create polygon, Generate legend on drawing sheet, Copy point attribute to object attribute, Make entity properties current and Edit road line in a drawing. For DTM; the user is now able to Drape image over 3D model, and also use height scale in 3D model.

Applanix launches POSPac Marine 5.0

Applanix recently introduced a new version GNSS-Aided Inertial post-processing software for marine mapping and surveying applications—the POSPac™ Marine 5.0 software. It combines GPS network and inertial post-processing methods that work together to eliminate or reduce the restrictions currently associated with high accuracy GNSS positioning in a Marine environment. It also released LANDMark Marine™ mobile mapping solution, which is videogrammetry and LIDAR imaging system for surface mapping suitable for operation on a marine vessel.

New TruePosition hybrid location solution

TruePosition has announced the Hybrid Location Solution, which combines network-based and handset-based location technologies and leverages the benefits of each to gain higher accuracy and reliability. The solution can incorporate a combination of location technologies such as Cell ID, Enhanced Cell ID, Angle of Arrival, Uplink Time Difference of Arrival, and Assisted GPS.

Pitney Bowes and Microsoft SQL alliance

Pitney Bowes MapInfo has announced that its flagship MapInfo Professional application for business mapping and analysis will utilize the spatial enhancements in Microsoft SQL Server 2008 to provide customers with enhanced geographic and business data management.

GeoEye and Mitsubishi agreement

GeoEye has signed a multi-year agreement with Mitsubishi Corporation to allow its Regional Affiliate, Japan Space Imaging Corporation to collect and sell Earth imagery and related products from the GeoEye-1 satellite. The contract was signed March 28, 2008 in Tokyo. The receiving antenna will be located in Okinawa and the processing facility will be located in Tokyo.

INTERGEO East successful once again

At the fifth INTERGEO event, almost 80% of exhibitors said that the fair was their top marketing activity for the year. It recorded some 3,000 trade visitors, 160 congress participants and 85 satisfied exhibitors from 19 countries. The three-day event staged by HINTE GmbH and CongrExpo d.o.o, which came to a close on February 20, once again underpinned its position as a key industry event for South-East Europe and an international forum for making new contacts. Over 80% of exhibitors achieved the goals they set themselves for the trade fair, and 75% of participating companies and institutions said that they would like to take part in the sixth show, which is scheduled for spring 2009.

Taiwan's GPS makers to tap European market with new devices

According to industry sources, Taiwanese GPS devices makers like Mio Technology Ltd. and Asustek Computer Inc are actively tapping the European market this year, with new products. Global sales of GPS devices are estimated to top US$30 billion this year. Europe absorbs nearly 60% of world`s total annual shipment. Last year, sales in the European market sharply shot up 82%. *http://cens.com//cens/*

GPS chipset price to fall to $3.5 or below by the end of 2008

According to ABI Research, one billion GPS chipsets will be shipped annually in 2013. It thinks Average Selling Prices (ASPs) of GPS chipsets will continue to fall, but the effect on vendors' revenue streams will be more than offset by this strong growth in volume. Industry analyst Jamie Moss comments, the average price of the chipset will fall to $3.50 or below by the end of 2008, permitting a true mass market adoption. There is a growing numbers of acquisitions: large chip manufacturers buying up specialist fabless GPS IC vendors in order to include their technologies in solutions that combine GPS with varied wireless RF product offerings, especially Bluetooth. Examples of such acquisitions in 2007 include Global Locate, acquired by Broadcom (June); GloNav by NXP (December); and u-Nav by Atheros (December). Additionally SiRF acquired Centrality to integrate System on Chip (SoC) solutions in its product range and u-blox went public on the Swiss stock exchange. *www.gpsbusinessnews.com*

Dell laptop to ship with GPS

Dell has come up with a new feature to

tempt business buyers into paying top whack – integrated GPS. The top-of-the-range E6500 model will also include UWB (ultra-wideband) wireless thanks to the inclusion of Intel's 'Montevina' chip, LED backlighting on a 15.4 inch screen and host of other features. *www.techworld.com*

TomTom Intros GPS Units with IQ Routes

GPS manufacturer TomTom has unveiled two new in-vehicle GPS systems, the Go 930 and Go 730, which will feature IQ Routes, a new route calculation system that uses data from actual speeds driven on roads rather than posted speed limits. The result might be a route that's a little unexpected or a little longer, but which can more reliably get users to their destinations faster. *www.tomtom.com*

University researchers track elephants using GPS

Using satellite technology, a team of researchers from the University of Massachusetts track African elephants across regions of Africa. By attaching GPS units, they have followed the animals as they move across national borders on the path of their seasonal migrations, from Botswana to Zimbabwe and into Angola. *http://media.www.dailycollegian.com*

Madurai Police in India launches GIS and GPS

Madurai Range police recently launched GIS, GPS and Short Message Serve Crime Criminal information system in Madurai and Virudhunagar districts, which would be connected to Transport Department's main server to enable police to get information about any vehicle in the state. The facility would help officers determine whether vehicle papers were genuine. *http://www.chennaionline.com*

Satellite built by Lockheed Martin successfully launched

A US Air Force modernized GPS Block IIR (GPS IIR-M) satellite was successfully launched from Cape Canaveral Air Force Station aboard a United Launch Alliance (ULA) Delta II launch vehicle. The satellite, designated GPS IIR-19M, is the sixth in a line of eight GPS IIR satellites that Lockheed Martin Navigation Systems, Valley Forge, Pa. has modernized for its customer, the Global Positioning Systems Wing, Space and Missile Systems Center, Los Angeles Air Force Base, Calif. *www.aero-news.net*

Middle East collaborates on Seismic Mapping

Earth scientists from Israel, Jordan and Palestine have formed a research partnership to map regional seismic activity. The researchers, from Tel Aviv University, Al-Balqa Applied University in Jordan, and An-Najah National University in Palestine will work together to map a 100 sqkm area around Jericho — one of the world's most vulnerable areas for earthquakes. The four-year project will assess potential seismic hazards as well as monitoring seismic activity.

"FLAIR Act" introduced in US House

A bill to develop a current, accurate Federal cadastre to inventory all Federal real property has been introduced in the U.S. House of Representatives, earning praise from MAPPS, the national association of private geospatial firms. The FLAIR Act authorizes the Department of the Interior to not only compile an inventory of Federal land ownership but also provides for conducting an inventory of current inventories to eliminate duplication and save tax dollars. *www.MAPPS.org.*

Dubai Municipality and Dubai Properties sign MoU to ease civic procedures

Dubai Municipality and Dubai Properties have recently signed an MoU to set up a frame work of coordination between them in order for the latter to avail municipal services in the easiest manner. It will facilitate easy provision of a variety of civic services to Dubai Properties including technical services in the fields of urban planning, land-use, surveying, regulation of contracting and consultancy professions, building license, geographical information and data, lab inspections for engineering materials, environment services etc. and other relevant services provided by the different organisational units within Dubai Municipality. *www.dubaicityguide.com*

Islamabad rejects US offer for conducting geological survey

Government of Pakistan has rejected a proposal from the US Naval Research Laboratory (NRL) to help in conducting Pakistanís geological survey and preparation of maps. The ministry of defense has in a circular directed all departments not to accept such proposal from any foreign institution as it may be a security risk. *http://paktribune.com/*

China cracks down on illegal online map services to protect state security

According to SBSM, the Chinese government is to crack down on illegal online map and geographical information websites due to security reasons. Eight departments, including the SBSM, the Ministry of Foreign Affairs, and the Ministry of Public Security, said they would tighten supervision over online map and geographical information service websites. Amost 10,000 online map websites operated in China, most of them showing maps without approval, says Min Yiren, deputy director of the SBSM. Foreign organizations and individuals engaging in making and publishing online maps in China would also be stopped. The campaign would also target websites that made mistakes such as labeling Taiwan a "country", wrongly drawing national boundaries, or omitting important islands including the South China Islands, Diaoyu Islands and Chiwei Island, said Min. A hotline has been set up for the public to report illegal websites. The SBSM put 418 Chinese and world maps on its website for the public to check and download. *http://news.xinhuanet.com/*

Government maps areas hit by malaria

The National Vector-Borne Disease Control Programme (NVBDCP), using GIS has brought out the country's first malaria map, to identify populations most at risk.The map first identified India's 60 most malaria-endemic districts that report over 50% of the country's malaria cases. Most of them are in north-eastern states, Orissa, Chhattisgarh, Jharkhand, Madhya Pradesh and Andhra Pradesh. Villages in these districts were then divided into low, medium, high and very high prevalence categories, using a simple mathematical model. According to NVBDCP director GPS Dhillon, "We have preparaed maps of all these 60 districts that also pinpoint the villages which need aggressive control and containment strategies immediately."

Bhugol Bhusan award for Dr Nag

Dr Prithvish Nag, Director, NATMO has been recently awarded the BHUGOL BHUSHAN AWARD 2008 by The Deccan Geographical Society for 'Outstanding accomplishments to date and noble example he has set for his peers and entire community in the field of Urban Land Use, Mapping and Remote Sensing Applicatios.'

Brazil to deepen Space Cooperation with China

According to Carlos Ganem , head of the Brazilian Space Agency, Brazil will deepen cooperation with China in the field of space technology. The jointly-developed satellite has helped Brazil better monitor the deforestation in the Amazon region, which can provide useful information on Brazil's environmental protection efforts. *www.spacedaily.com*

Satellite imagery to track naxals in India

The Central Reserve Police Force (CRPF) is planning technological advancement to curtail the growing menace of naxals in India. ISRO shall develop a satellite mapping system for the CRPF in order to keep a tab on the naxal movement. An integrated GIS sytems will be implemented in all the areas to pinpoint naxal hideouts via the use of satellite images. *www.timesnow.tv*

China to monitor land use via satellite

China shall soon use satellite remote sensing technologies to draw up a map covering the country's 9.6 million square kilometers of territory. It will help monitor land use and protect the legitimate rights of farmers. Ministry of Land and Resources will start using the high-tech devices this year to detect and prevent illegal use of land, particularly arable land. *http://news.xinhuanet.com/*

Russia to be covered with stereo images from Cartosat-1

ScanEx has announced about its right to receive 6000 minutes (100 times more!) of Cartosat-1 data and exclusive right in distribution of acquired data. The contract signed between ScanEx and ANTRIX Corporation Ltd in August 2006 provided for 60-minute data transmission to UniScan™ ground stations. Since March 2008 the new agreement comes into force under which 5 ground stations in Khanty-Mansiysk, Irkutsk, Yakutsk, Magadan and Samara will be receiving data from the satellite for the maximum possible coverage of the Russian territory with stereo images. It also provides similar license terms for the reception and exclusive right in distribution of data from another IRS series satellite - Resourcesat-1 (IRS-P6).

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Nokia launches global Ad campaign for GPS-enabled N82 handset

"The Urbanista Diaries," is the new global campaign by Nokia to promote the recently launched Nokia N82 that features a 5 megapixel camera and integrated GPS. The campaign engages bloggers, journalists, and everyday people to promote the phone.

EU to deepen investigations on Nokia-Navteq

The European Commission is set to deeper its investigation into Nokia pending $8.1 billion acquisition of Navteq, according to Dow Jones Newswires. *www.gpsbusinessnews.com*

Microsoft selects Tele Atlas for web, mobile apps in North America

Tele Atlas has signed an agreement with Microsoft to power its mapping and location platform services. Live Search Maps, Virtual Earth and Microsoft Streets & Trips will rely on Tele Atlas digital maps and content, including points of interest for the USA and Canada.

MyLoki: from FaceBook to email signature, location everywhere

Skyhook Wireless, has unveiled MyLoki, a service that feeds location from Wi-Fi enabled devices to personal blogs, social networking sites (like facebook) and location directories like Fire Eagle. *www.gpsbusinessnews.com*

Navigon launches FreshMaps: three years quarterly map updates

German PND manufacturer Navigon has announced a new service called FreshMaps which intend to protect its customers against map data obsolescence. It will enable its customers to update their maps every quarter during three years. *www.gpsbusinessnews.com*

Wayfinder introduces free mobile GPS application

Wayfinder, is introducing its Wayfinder Active™ application in the U.S. and

Market predictions

Global mobile navigation device shipments hit 39 million in 2007

The size of GPS navigation industry is increasing according to the latest figures from industry analyst firm Canalys. Year-on-year growth in mobile GPS navigation device shipments stood at 148% worldwide in Q4 2007, the highest seen since Q1 2006. Furthermore, despite all the recent activity in the smart phone segment of the market, which is the fastest growing according to Canalys, shipments of PNDs were up 150% year-on-year in Q4 and represented a stable 90% of total device shipments. Canalys estimates that around 6.7 million PNDs shipped in the US in Q4 2007, representing 55% of the total for the year. In Q4 2006 the figure was below 1.5 million, showing just how much the market has grown and the extent to which the US, once tiny compared to the European market for such devices, has become a major arena for the many competitors in this industry. The APAC region is the next fastest growing after North America, with Q4 2007 shipments of around 1.7 million mobile GPS navigation devices representing a 137% rise on the equivalent figure in Q4 2006. The contrasts between this region and the US couldn't be more marked. India presents huge challenges and opportunities in equal measure. While still a nascent market for mobile navigation solutions, in Q4 2007 it was the third largest smart phone market in APAC after Japan and China, with quarterly shipments exceeding 1 million units for the first time. *www.canalys.com*

Aberdeen Study reveals financial impact of GPS tracking in US

A recent survey of service companies nationwide by the Aberdeen Group revealed that nearly one-third of leading companies are using GPS-based location data to improve customer service and monitor assets. Highlights of the survey data include service companies reporting reduced overtime costs on average of 13.4%, which equates to a reduction of $496,493 in recovered overtime with the deployment of GPS-based location enabled technology. In addition, location data is in widespread use to improve the scheduling and dispatching of technicians, vehicles and parts delivery in real-time, so as to improve service delivery and overall customer experience. *www.prweb.com*

European cellular LBS players Facing Stiff Competition

The European mobile phone market is on the verge of embracing LBS, but it is going to face some stiff competition, at least as far as satellite-based navigation services are concerned, says IMS Research. All the pieces of the LBS puzzle seem to be finally falling into place in the European market, including a portfolio of GPS-enabled handsets, mainstream services offered by major operators, and the European Commission imposing cheap data roaming rates, according to the market research firm. But for most consumers, LBS at the moment is generally synonymous with satellite navigation, IMS notes. In Europe there are a little more than 260 million light vehicles, at the latest count; the addressable market for satellite navigation is therefore limited to this. Furthermore, Europe was one of the earliest markets to embrace satellite navigation. By mid-2009 more than 60 million PNDs will have been sold on the continent, posing a formidable market foe for cellular-based LBS, IMS said. *http://lbs.gpsworld.com*

LBS to reshape mobile VAS market

Location-based services, such as the one letting parents monitor the whereabouts of their children, will lead a new set of value-added services that will reshape India's mobile VAS market, now dominated by ringtone and music downloads. With the country's mobile subscriber base is expected to touch 500 million users by 2010, mobile VAS players are now looking to cash in on LBS, to boost up the share of such services.

According to OnMobile Global CEO, the revenues through offerings such as location-based services would increase faster than those through entertainment-related services as mobile consumers become more technology savvy. *http://economictimes.indiatimes.com*

Canada. It is a free GPS application for mobile phones with a combination of maps, GPS recording and statistics designed for people who enjoy running, hiking or other outdoor activities. *www.wayfinder.com*

Motorola brings the power of touch to mobile TV device

Motorola has recently unveiled the Mobile TV DH02 – a personalized TV, multimedia entertainment on the go and navigation device featuring a touch screen user interface. It also has HSDPA/ GPRS back channel support. *www.pr-usa.net*

RFID technology keeps track of school bus riders

Seattle-based Zonar Systems is providing RFID technology to the school bus industry to keep track on school children. It patented ZPass system identifies when and where a student enters or exits the school bus to enhance their safety and security. *www.gpsdaily.com*

Qualcomm introduces GPS based Service Fleet Manager

This service is location/country specific. What country is it Service Fleet Manager by Qualcomm is the first OmniVisionSM Metro service designed to meet the needs of local service-based businesses. It has industry-specific capabilities and features such as detailed maps and reports providing a snapshot of an entire fleet for improved logistical planning. *www.cbronline.com*

San Diego Harbor Police deploy BIO-key automated vehicle location system

BIO-key International, Inc., which is in finger-based biometric identification and wireless public safety solutions, announced the award of a contract from the San Diego Harbor Police Department to deploy BIO-key's automated vehicle location (AVL) capability in its patrol vehicles. San Diego Harbor PD, a BIO-key customer since 2000, has primary public safety and homeland security responsibility within the San Diego Unified Port District, which includes cargo and cruise ship terminals and the San Diego International Airport, as well as law enforcement and marine firefighting in San Diego Bay. *www.lbszone.com*

Qualcomm QST1000 Chipset With ARM11 For Mobile Devices

Qualcomm has developed QST1000 chipset, incorporating an integrated ARM11 applications processor to power PND's, portable multimedia players and entertainment devices. These chipset are a single platform of solutions , which includes wireless connectivity, multi-mode GPS positioning; a high-performance ARM11 applications processor running at 528 MHz plus support for broadcast mobile TV. *www.arm.com*

T-Mobile rolls out BlackBerry 8820

T-Mobile has launched BlackBerry 8820, integrated GPS. It also supports the T-Mobile HotSpot @Home Mobile WiFi service as well. *http://blogs.zdnet.com*

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www.plansconference.org

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1 – 6 June, 2008
Department of Geography, University of the Aegean, Mytilene, Lesvos , Greece
http://www.aegean.gr/geography/earthconference2008/ en/main_fr.htm

FIG Workshop E-learning
11-13 June 2008
ITC, Enschede, The Netherlands
fig-elearning2008@itc.nl
www.itc.nl/fig_elearning2008

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www.isprs2008-beijing.org

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Institute of Navigation's Satellite Division ION GNSS 2008
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www.ion.org

The Perspectives, The role of Surveyors in the European Economy and Society
17-19, September
Strasbourg, France
www.geometre-strasbourg2008.eu

CARIS 2008
September 22 - 26, Bath, United Kingdom
www.caris.com/caris2008

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