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ATSB® Contributions to Space in Malaysia

Rise of the Mobile Society: The Geoinformation Revolution

Penghasilan dan Penambahbaikan Pangkalan Data Geospatial Skim Perlombongan dan Kuari Jabatan Mineral dan Geosains (JMG)

Terbitan :
Pusat Infrastruktur Data Geospatial Negara (MaCGDI)
Kementerian Sumber Asli dan Alam Sekitar (NRE)
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dari meja
Ketua Editor

Assalamualaikum, Salam Sejahtera dan Salam 1Malaysia

Alhamdulillah, dengan izinNya BGSA Edisi 1/2013 berjaya diterbitkan. Terbitan ini dipenuhi dengan perkembangan teknologi terkini, laporan kerja usaha sama antara MaCGDI dan agensi lain serta laporan aktiviti-aktiviti berkaitan geospatial yang telah dijalankan.

Program RazakSAT® adalah petunjuk kemajuan Malaysia ke arah menjadi Negara maju. Hal ini dibuktikan dengan kejayaan Malaysia dalam menghasilkan satelit sendiri. Kejayaan ini meletakkan Malaysia sebagai negara utama dalam teknologi angkasa di rantau ini. Artikel ATSB® Contributions to Space in Malaysia dapat meningkatkan kefahaman masyarakat tentang angkasa dan satelit.

Teknologi geoinformasi telah wujud sejak dahulu lagi, kajian yang dijalankan di seluruh dunia mengenai aplikasi yang berpotensi dalam nilai pasaran geoinformasi dalam pasaran mudah alih dapat dibaca dalam artikel A Rise of the Mobile Society: The Geoinformation Revolution. Bermula sejak Google melancarkan Google Map, revolusi penggunaan maklumat geoinformasi dan geospatial ini digunakan secara meluas. Sejak pengenalan telefon pintar, ia menjadi titik tolak lonjakan revolusi penggunaan teknologi geoinformasi kepada masyarakat secara besar-besaran. Kepantasan keboleh capaian maklumat dengan rangkaian 4G menjadikan maklumat disebar dengan pantas dan tepat. Hal ini menjadikan revolusi penggunaan geoinformasi oleh masyarakat sangat optimum dan dijangkakan akan bertambah pada dekad akan datang.

MaCGDI yang berperanan sebagai agensi yang memperkasa teknologi geospatial telah bekerjasama dengan pelbagai agensi dalam memberikan khidmat nasihat dalam bidang berkaitan geospatial. Artikel Penghasilan dan Penambahbaikan Pangkalan Data Geospatial Skim Perlombongan dan Kuari Jabatan Mineral dan Geosains (JMG) ini menunjukkan inisiatif yang dimainkan oleh kedua-dua agensi dalam menambah baik penghasilan maklumat geospatial.

Saya berharap segala maklumat yang dimuatkan dapat dimanfaatkan bersama oleh semua pihak yang terlibat secara langsung atau tidak langsung dalam bidang geospatial. Tidak lupa juga kepada semua pihak yang memberikan kerjasama dan sumbangan dalam menerbitkan Buletin edisi ini.
Sekian, terima kasih.

Selamat membaca!

Fuziah binti Hj. Abu Hanifah
Pengarah MaCGDI

Kandungan

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ATSB® Contributions to Space in Malaysia

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Abstract

Astronautic Technology (M) Sdn. Bhd. (ATSB®) was established in 1997. ATSB® is a wholly owned company by the Malaysian government under the Minister of Finance Inc., and reporting to Ministry of Science, Technology and Innovation (MOSTI). The company was initially set up to develop space and satellite technology by focusing on research and development for the Malaysian space sector. Since then it has employed advanced and innovative technologies through synergistic collaborations with partners in Malaysia and around the world. ATSB® is now geared towards commercialisation by creating unique value propositions in gaining competitive advantage when offering products and services to customers.

Keywords — ATSB®, Malaysian space sector.

ATSB® started its first endeavour in space with the TiungSAT-1 programme; Malaysia's first microsatellite. It was initiated as a response to the challenges embodied in the Vision 2020 and was announced by the Prime Minister of Malaysia at that time, Tun Dr. Mahathir Mohamad on 13 January 1995. The programme involved the microsatellite construction, launch and operation as well as the establishment of the mission control ground station in Malaysia.

It was done via transfer of technology (TOT), from Surrey Satellite Technology Limited (SSTL) of the United Kingdom. The TOT involved

a team of eight Malaysian engineers and scientists from ATSB®, Universiti Sains Malaysia (USM), Universiti Kebangsaan Malaysia (UKM), Universiti Teknologi Malaysia (UTM) and Ministry of Defense (MINDEF). This started in June 1997 and continued until March 1998.

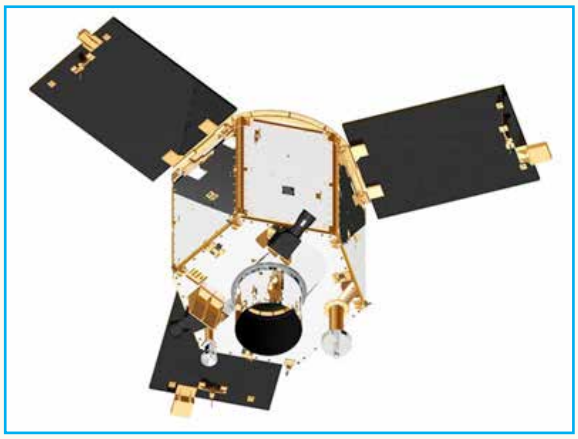
The TiungSAT-1 programme provided Malaysian engineers with first-hand practical experience and skills acquired through on-the-job-training (OJT) and being directly involved in the satellite life-cycle which consists of:

- Mission analysis
- Subsystem and payload design
- Satellite manufacture
- Assembly, integration and test
- Environmental test
- Launch campaign and launch
- In-orbit commissioning and operation.

The TiungSAT-1 has successfully developed the first group of Malaysian human capital in space engineering. It was not only the TOT engineers and scientists but also others who were involved in the setting up of the mission control ground station and its operation, as well as the researchers who exploited the images from TiungSAT-1 as indigenous findings.

TiungSAT-1 launched by Dnepr rocket on 26 September 2000.

As the TiungSAT-1 was nearing its launch date, the plan to have a contiguous programme was already underway. ATSB® once again was given the task, this time to develop the next and more advanced remote sensing satellite, which was later to be called RazakSAT®. This programme first started with the development of the optical sensor payload, called the Medium Aperture Camera (MAC) in 2000. Consequently, the development of the satellite bus platform took its turn in 2001. RazakSAT® turned out to be the first remote sensing satellite launched into the Near Equatorial Orbit (NEqO) which took advantage of the most frequent revisits over Malaysia. The RazakSAT® was successfully launched on 14 July 2009 from Kwajalein Island in the Pacific.



RazakSAT® was launched using the Falcon 1 rocket.

Besides continuing the Malaysian capacity building in space, the RazakSAT® programme successfully enhanced Malaysia leadership position in space technology amongst the countries in South East Asia. About 300 knowledge workers gained invaluable experience and expertise in various aspects of space know-how which included satellite engineering, satellite assembly, integration and test facility, space project management, space law and contracts, satellite launch, space risk management, satellite operation, satellite image processing and satellite image data exploitation. These resources are distributed among various organisations such as ATSB®, National Space Agency (ANGKASA), Malaysian Remote Sensing Agency (ARSM) and Malaysian universities.

Several Research and Development (R&D) projects on space technology were completed during the RazakSAT® programme. For example, ATSB® conducted R&D on satellite solar panel, electro-optical payload system, satellite attitude control, satellite communication and small rocket propulsion. These engineering activities have further strengthen the space capabilities in Malaysia.

RazakSAT® programme objectives were also to increase local content in the satellite manufacturing area. ATSB® had outsourced and supervised the manufacturing of mechanical parts to local machine shops. This has not just provided jobs to the local industry but has helped to increase the indigenous technological capacity.

During the RazakSAT® programme, ATSB® expertise contributed towards establishing several space facilities such as the Pusat Angkasa Negara which allows for the Assembly, Integration and Test (AIT) of satellites, and the antenna and ground system for RazakSAT® satellite mission operation. ATSB® was also responsible for the setting up of the image receiving system at the ARSM ground station in Temerloh.

TiungSAT-1 and RazakSAT® programme have not only contributed to the build-up of industrial space capabilities and capacity in Malaysia but also to the development of academic research and teaching programmes in space or satellite related subjects. These satellite development programmes are testament to the Malaysian government policy for Malaysia to be involved and exploiting space technology and its applications. With ATSB® leading the development of space technology in Malaysia, the need for indigenous space engineers has become a reality.

This in turn has spurred various Malaysian universities to offer courses in space for undergraduate and postgraduate studies which include Universiti Sains Malaysia, Universiti Kebangsaan Malaysia, Universiti Putra Malaysia, Universiti Teknologi Malaysia, Universiti Malaysia Perlis and Universiti Islam Antarabangsa Malaysia.

The collaboration with local universities has also been enhanced through the conduct of local colloquiums. The first colloquium was done between ATSB® and Universiti Malaysia Perlis in 2010 and more recently with another university, the Universiti Islam Antarabangsa Malaysia. In the colloquium, topics about

satellite and space technology was presented and shared among the participants to expand knowledge and encourage collaborations in space between universities and industry. ATSB® has been successfully conducting various space engineering courses to participants from universities, government agencies and industry. Through this platform, participants were exposed to the basic and intermediate know-how regarding space engineering, and includes ATSB® experiences in space projects which are not available in schools and universities.

There have been spin-off projects such as robotic telescope, tsunami early warning system and radiation monitoring system which were delivered to the Malaysian government by ATSB®. These spin-off projects have benefited from the expertise and experiences in space engineering throughout the years which was then translated into terrestrial systems.

ATSB® contribution in space shall continue with the support of the Malaysian government and the local industry. The contribution so far, has established Malaysia as the leading country in space technology in the region and currently is moving towards exploiting this capability for commercialisation. Whether directly or indirectly ATSB® has helped to improve the general awareness and understanding of Malaysians about space and satellites and what they can do.

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RISE OF THE MOBILE SOCIETY: THE GEOINFORMATION REVOLUTION

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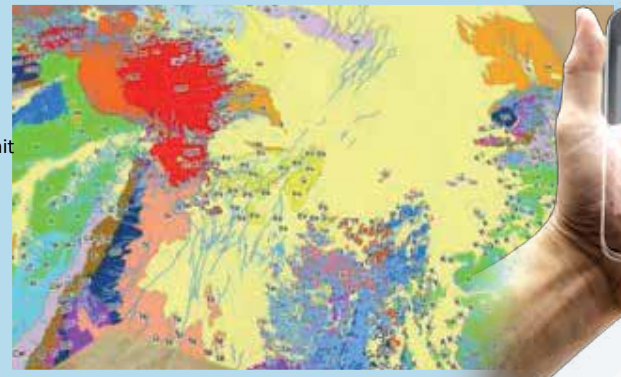

Abstract

Geoinformation is intrinsically valuable and when used to enhance other information sources, it can significantly improve the quality of life. Surprisingly, the intrinsic value of geoinformation has been traditionally exploited mainly at government and enterprise levels. Beyond the prevailing traditional market, there exist an enormous market opportunity for geoinformation use by the mass market. The mobile mass market is the private consumers who fully expect to have an instantaneous access to up-to-date, relevant geoinformation anytime and anywhere. The main reason behind this is; geoinformation can be used to enhance the quality of daily tasks of the mass consumer in a countless number of ways. Market research estimates that the overall traditional market for geoinformation is worth at least $5 billion today and over $50 billion annually after five years. Apart from the traditional market, the potential market for accessing geoinformation services from mobile devices is extremely large and the way mobile devices users can access that geoinformation is through applications running on their i-Phones, Android and Symbian-based devices. The estimated total market

potential for geoinformation (the combination of the traditional earth observation market and the mobile applications market) is worth $17.5 billion today and is projected to be worth $61 billion in 2014. This article will analyse data from reliable information and highlight studies which are carried out around the globe regarding the potential applications and the market value of geoinformation in the mobile mass market and also the link connecting the mass mobile society and geoinformation.

Keywords: *Geoinformation, Mobile society, Mobile mass-market, Location Based-Services, Mobile apps*

GEOINFORMATION

Geoinformation is defined as a set of information about a specific point on earth. It also can be defined as spatial information about features or attributes. The information about the point can be a set of existing information or, it can be in a specific required time or, it can be real-time figures. What is in common between these three types of geoinformation, all are intrinsically valuable to the intended users and when it is used to enhance other information sources, it will significantly improve the quality of life. In the internet age now, geoinformation will be a part of every living aspect in order to reach our goals for the day or for years to come. Surprisingly, as for today, the market for geoinformation is mainly driven by those who have an important need of national and business interest despite the fact that private or individual consumers are the one who are fully in need of the up-to-date geoinformation.

Sources of Geoinformation

Data from land surveying has traditionally been the first layer of geoinformation by providing accurate maps and positioning. On-site survey producing topographic maps in multiple scales and from various sets of datum has been the base of every spin-off maps produced. Later, with the technological advancement of optical instruments combined with aerial capability, photogrammetry was born. Air borne images was considered a more established technique to require earth attributes information, having being used in reconnaissance and surveillance since World War I. Aerial image offers the opportunity of having the maps originally by the land surveyors to be cross-checked for consistency and updating purposes.

The utilization of space technology has truly revolutionized the way of getting data of the earth. Global Positioning System (GPS) provides accurate positioning of earth attributes by the will of the user. Developed by the United States Department of Defence (DOD) in early 1980's, the contribution has been enormous in the sense of positioning, navigation and timing. Positioning provided on ground in sub meter is a revelation to the location based enterprises and agencies dealing with environment and disaster management. Space technology again took a huge step ahead by introduction of earth observation satellites (and more generally known as remote sensing). Earth observation is the act of gathering information about the physical, chemical and biological systems. High resolution earth observation information can be used to monitor and assess the status of and changes in the natural and the built environment.

Above all, space-borne and air-borne data has made raw information more reliable, accurate and timely to the recipients. Furthermore with these new age data sources, the raw information of geoinformation is made more visually attractive and more understandable to the mass market.

The Integrator and Dissemination

In order for the information to be meaningful to the public, data sources from the above paragraph must be integrated and interlinked with each other. Not to leave behind, integration of data from other sources intended for specific purposes such as meteorological and hydrographical data.

Geographic Information System (GIS) is the main tool acting as the integrator. GIS will integrate the data and it will also be managing, analysing, and displaying all forms of geographically referenced information. GIS allows the user to view, understand, question, interpret and visualize data in many ways that reveal relationships, patterns and trends in the form of maps, globes, reports and charts. With the integration done in a simple and meaningful way, geoinformation will be disseminate to the users via internet/ mobile service provider (ISP/MSP). From this point forward, geoinformation are ready available to the specific users according to their specific task or request. The traditional way of disseminating geoinformation is by 'pull services' by the user. Pull services for geoinformation defined as delivering geoinformation directly requested by the user either while mobile or static. The information received by the user will be specific as demanded. As an alternative, 'Push services' will deliver information which are either not or indirectly requested from the user. Both of these services will be elaborated in detail in the 'mass market needs' section.

The internet browser plays a huge role of introducing the benefits of geoinformation application to the public. February 2005, Google Map was launched by Google. The site led the revolution of online geoinformation to the public. With the simple business model of micro transaction through advertisement, Google have achieve what is unthinkable during that era which is gaining profit in millions by exploiting geoinformation to the mass public.

THE MOBILE SOCIETY REVOLUTION

Mobile society refers to a massive group of people which are heavily dependable to their mobile devices to communicate, to execute their daily jobs and to enhance their quality of life. A mobile device is referred to as a handheld, handheld device or handheld computer is a pocket-size computing device. Mobile devices usually come with a touch or non-touch display screen.

At the end of 2011, there are 6 billion mobile subscriptions estimated by The International Telecommunication Union (ITU). That is equivalent to 87 percent of the world population. It is a huge increase from 5.4 billion in 2010 and 4.7 billion mobile subscriptions in 2009. As for smartphone sales in 2011 reached 472 million units and accounted for 31 percent of all mobile devices sales. It all begins in 2007, with the introduction of Apple iPhone and Android powered smartphones which spark the revolution of the mobile society worldwide.

The Revolution catalyst: Mobile application for iOS and Andriod

Mobile applications is also called mobile apps, it is a term used to describe an application that run on smartphones and other mobile devices. Mobile applications usually help users by connecting them to internet services more commonly accessed on desktop or notebook computers or help them by making it easier to use the internet on their portable devices. A mobile apps may be a mobile web site bookmarking utility, a mobile-based instant messaging client, Gmail for mobile and many other applications.

Mobile application development is the process by which application software is developed for small low-power handheld devices such as personal digital assistants, enterprise digital assistants or mobile phones. These applications are either pre-installed on phones during manufacture, or downloaded by customers from apps stores and other mobile software distribution platforms.

Key mobile applications provider is a duopoly by Apple's Apps Store and Android Market. The Apple's store attracted nearly 24,000 of apps developers whereas the Android Market attracted over 4,000 developers in the same period. In 2009, the total number of apps downloads globally were approximately 7 billion with Asia leading the way with 37 percent of the global downloads. By 2012, the total number of apps downloads are expected to grow at 92 percent to almost 50 billion downloads per year. Among the most popular are apps that provide some form of entertainment such as games, music, food, travel and sports; as well as those that help people find information they need and accomplish tasks (maps and navigation, weather, news, banking).

Location-based Services Apps

Gartner, Inc. has identified the top ten consumer mobile applications for 2012 and onwards. Gartner listed applications based on their impact on consumers and industry players, considering revenue, loyalty, business model, consumer value and estimated market penetration. The prediction made was that most users will use no more than five mobile applications at a time and most future opportunities will come from niche market 'killer applications'. The top ten consumer mobile applications in the future are money transfer, Location-based Services (LBS), mobile search, mobile browsing, mobile health monitoring, mobile payment, near field communication services, mobile advertising, mobile instant messaging and mobile music.

LBS form part of context-aware services, a service that Gartner expects will be one of the most disruptive in the next few years. Gartner predicts that the LBS user base will grow globally from 96 million in 2009 to more than 526 million in 2012. LBS are ranked No. 2 in Gartner's top 10 because of its perceived high user value and its influence on user loyalty. Its high user value is the result of its ability to meet a range of needs, ranging from productivity and goal fulfilment to social networking and entertainment. Market awareness of geoinformation is driving a high adoption rate for applications on mobile devices. Of the $118 million in revenue that downloadable mobile applications such as LBS, weather applications, chat/community and personal organization tools generated during second quarter of 2007, LBS represented 51 percent.

THE MARKET FOR GEOINFORMATION

As of today, the market for geoinformation consisting mainly of raw satellite imagery is driven by those who have an important need for this type of geoinformation and who can afford to pay the high costs of obtaining the satellite imagery. This market is dominated by governments and large enterprises that use the imagery from both space and air for defence and security, resource planning and management, land surveying, agriculture and scientific purposes.

Table 1. Revenues for Geoinformation, Includes Sales of Satellite Imagery and Value Added Services Derived from Satellite Imagery

Region	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	CAGR
North America	$966	$1,030	$1,102	$1,193	$1,300	$1,429	$1,579	$1,749	$1,953	$2,179	9.5%
South America	$101	$109	$117	$127	$137	$149	$162	$176	$191	$208	8.4%
Europe	$692	$746	$804	$867	$938	$1,017	$1,102	$1,195	$1,297	$1,414	8.3%
Asia	$204	$221	$239	$259	$281	$306	$334	$367	$404	$446	9.1%
Middle-East and Africa	$135	$144	$153	$162	$173	$184	$195	$208	$222	$238	6.5%
Total (US$ M)	**$2,098**	**$2,248**	**$2,415**	**$2,609**	**$2,830**	**$3,086**	**$3,373**	**$3,694**	**$4,067**	**$4,485**	**8.8%**

As of 2009, the total market for geoinformation, which includes revenues of sales of satellite imagery and value added services base, was worth a total of $2.1 billion and more than 75 percent of all satellite imagery revenues were from government sales. Analysts predict that by 2018, if there are no fundamental paradigm shifts, the market for geoinformation will double and be worth $4.5 billion.

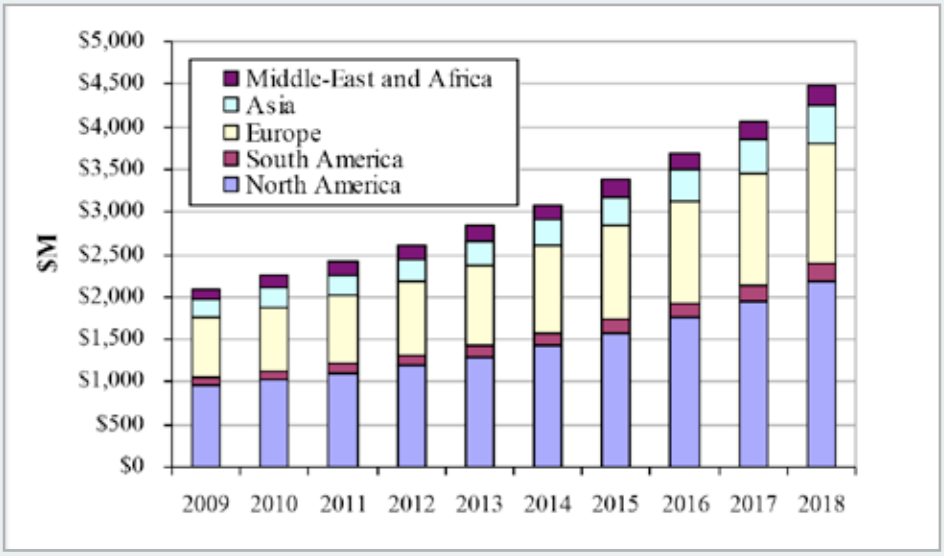

Figure 1. Graph of Revenues for Geoinformation, Includes Sales of Satellite Imagery and Value Added Services Derived from Satellite Imagery

The Global Market Landscape

The geoinformation market value chain can be understood by three components:

Component 1	The information component
Component 2	The value added service component
Component 3	The distribution of information and value added services to end user component

The relationship between these three components is shown in Figure 2.

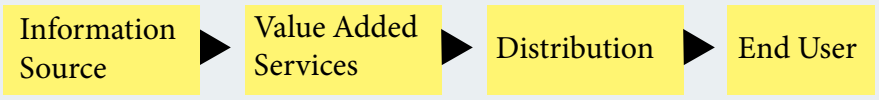

Figure 2. Value Chain for the Geoinformation Market

End users have a need to access geoinformation from their mobile devices. The information sources component of the value chain represents the sets of information required to create value added services. The value added service part of the value chain is the process of creating, deriving or combining information together to create geoinformation. The distribution part of the value chain is the process of delivering the geoinformation to the end users through a mobile device.

The players in the geoinformation market today can be categorised by what they offer along the value chain. One set of players, the imagery and limited value added service providers such as Digital Globe and Spot Image, provide high resolution imagery that is updated on the order of once a year, and only offer a limited set of value added services that are customized to each customer's needs. The second set of players, the LBS providers creates location based value added services for mobile devices. Players in this market include Facebook and Foursquare. The third set of players, the information delivery providers, connects people to information. Information delivery providers include both hardware device providers, such as Nokia, storage and processing players such as Sun Systems, network platforms, such as CISCO and information organizations such as Google and Yahoo.

Mobile Apps Market Opportunity for Geoinformation According to a report, worldwide revenue from mobile applications totalled about $6.8 billion in 2010, an increase of 60 percent over the $4.2 billion spent in 2009. Growth in revenue from mobile apps can be expected to continue at a rapid rate, as more consumers purchase smartphone and more apps become available. It is predicted that in 2013, 21.6 billion apps will be downloaded, generating nearly $30 billion in revenue. Gartner Inc. reported that 82 percent of all downloads are free in 2010, and that the share of free apps will increase to 87 percent by 2013. This leaves mobile advertising to make up for the loss in share for paid apps - Gartner claims that in 2010, 0.9 percent ($0.6 billion) of mobile apps revenue will be generated by advertising.

Apps makers will be more dependent on advertising revenue as the number of free apps proliferates. Just from 2009 to 2010, average revenue per apps is expected to drop by 11 percent, from $1.68 to $1.50. By 2013, according to Gartner's numbers, the average revenue per apps will be $1.36.

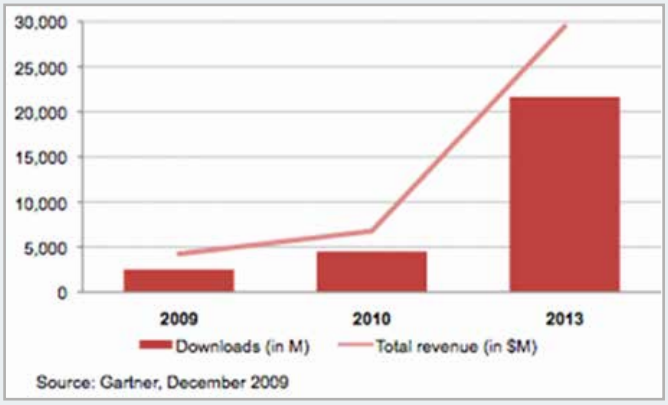

Figure 3. Mobile Applications Store's Number of Worldwide Downloads and Revenue.

Another report from International Data Corp. (IDC) is projecting that the mobile application business will soon grow from 10.9 billion downloads in 2010 to 76.9 billion downloads in 2014. This growth will also mean a 60 percent per year increase in mobile application revenue, says the report.

Consumers will spend $6.2 billion in 2010 in mobile application stores while advertising revenue is expected to generate $0.6 billion worldwide. Analysts said mobile application stores exceeded 4.5 billion downloads in 2010, eight out of ten of which will be free to end users. Gartner forecasts worldwide download in mobile application stores to surpass 21.6 billion by 2013.

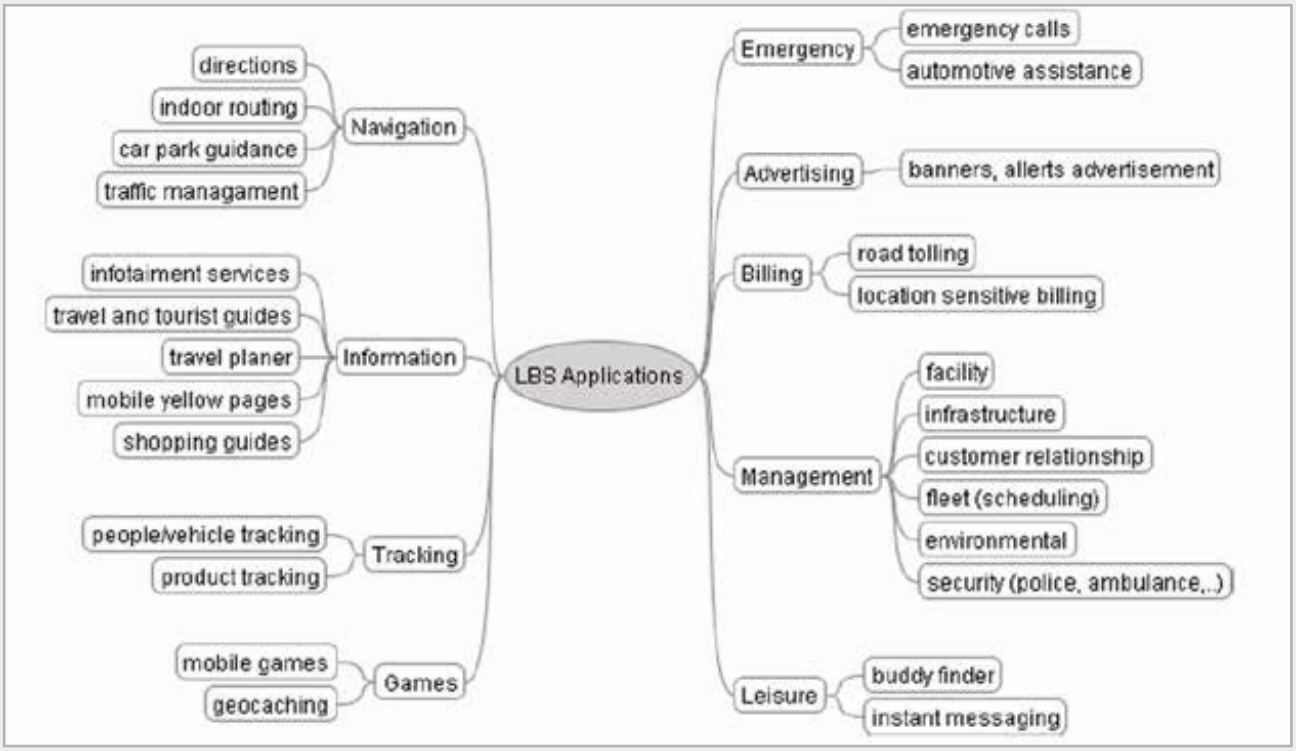

Figure 4. Various potential and market segments for geoinformation services

Figure 4 provides an overview of the existing and potential markets for which geoinformation can be used for. The application ranges from games for mobile devices to mapping and navigation.

The Driver

- Smartphone getting cheaper: Smartphone manufacturer are mass producing phones for the market. With the competition between smartphone manufactures giants such Nokia, Samsung, HTC, Apple and Sony, the price of sophisticated smartphone are getting cheaper every day, thus it is affordable for the mass market to have one.

- Mobile Technology: The current technology of computers software, hardware, processing and mobile communication and has allowed for the mobile phones to be as powerful as a laptop or a desktop computer. The applications usually are not compatible to be executed in a normal mobile phones are now possible.

- The rise of the 'Apps Culture': Along with the widespread embrace of mobile technology has come the development of an "apps culture." As the mobile phone has morphed from a voice device to a multi-channel device to an internet-accessing mini-computer, a large market of mobile software applications.

- The need of information: Information is the key for people to make decisions. With the information available from a push of a button, decisions could be made that can save millions of dollars or to save a life. Apps that supply information to people need to accomplish tasks such as maps and navigation, weather, news and banking is essential to most of the adults who have a smartphone.

- The booming of Social Media Culture: Facebook and Twitter has made a lot of impact to the citizen of the world today. Recent event that shook the world politically spreads around the community with the usage social media that originates from the smartphone that has a social media app.

- The iPhone, iPad and Android factor: The impact of iPhone and iPad starts from the United States and rapidly spreads to the rest of the world by storm. With the tremendous achievement of the iPhone sale and the Apple Apps Store, other phone manufactures starts trying to replicate the accomplishment by developing other types of smartphone and came along Android OS which is the operation system for the developed smartphone.

THE MOBILE MASS MARKET NEEDS FROM GEOINFORMATION

Geoinformation is intrinsically valuable, and when it is made relevant, accessible and affordable anytime, anywhere, geoinformation will revolutionise the way each and every person on this earth lives and interacts with the world around them.

According to research, to provide useful and relevant geoinformation data for the mobile mass market, the following primary objectives must be met:

- Imagery with less than or equal to one metre resolution, to enable detection of small changes, such as a fallen tree, or the movement of a car, on the earth's surface.

- Imagery catalogue that is at most one week old, to track changes on the earth's surface and to provide the commercially most up to date geoinformation.

- Optical imagery, to provide true colour images desired by the mobile mass market.

- Synthetic aperture radar (SAR) imagery, to provide further information about the earth's surface, as well as a fully reliable imagery source independent of lighting or cloud conditions.

- Accessible anytime anywhere from mobile devices such as mobile phones, tablets, or laptops.

- Affordable prices for the services that do not require the mobile mass market user to pay more than a few cents for geoinformation.

In other words, in order to cater the needs of mobile mass market to accept and regularly use geoinformation apps, the information provided must be:

i. Timely
ii. Accurate
iii. Up-to-date
iv. On-demand
v. Cheap

Geoinformation Services for the Mobile Mass Market

Business model is fundamental to tackle the geoinformation needs of the mass market. In general, one can distinguish two different kinds of geoinformation services considering if the information is delivered on user interaction or not:

a. Pull services deliver information directly requested from the user. This is similar to call a website in the internet by fill in its address in the web browser-address field. For pull services a further separation can be done into functional services, like ordering a taxi or an ambulance by just pressing a button on the device, or information services, like the search for a close fast food restaurant.

b. Push services deliver information which is either not or indirectly requested from the user. Such push services are activated by an event, which could be triggered if a specific area is entered or triggered by a timer. An example for an indirectly requested service is a news service subscription which contains event information with respect to the actual city. A not requested service could be advertisement messages if a specific area in a shopping mall is entered or warning messages if weather conditions change (e.g. hurricane warnings). Since push services are not bound on previous user interaction with the service, they are more complex to establish.

The business models for apps have evolved over time. Initially, the focus was entirely on the paid downloads or the subscription based models that bundled other forms of content like the ringtones and pictures with applications.

Mobile Geoinformation Apps Categories

The following list is by no means an exhaustive one of geoinformation apps types, only a sampling. Note that some example apps might actually fall into several categories.

a. Social networks - Twitter, Facebook native apps on various mobile devices. While Twitter and Facebook location data is still limited at present, there is implicit information included in status updates posted. However, both companies are said to be adding more location data in the near feature.

b. Social shopping - Yelp, Foursquare, MyTown and Gowalla. Found a good or bad place to shop, eat and enjoy? Let others know by checking-in your location and adding a comment.

c. Moodsourcing - Stuck, Pocket Life. Both of these apps not only let you check-in the users location but select an icon or some pre-worded text to convey the users current mood.

d. Location-planning - Loopt Pulse, which is similar to the above social shopping apps in that the user can browse for nearby venues, stores and cafes. The user can also browse for places and even see relevant pictures for a place.

e. Navigation, trip tracking - Trapster, Glympse. Trapster functions as crowdsourced speed trap warning and navigation system. Glympse also lets the user to see real-time location trails of friends who have enabled this while taking a road trip.

f. Freelancing - Field Agent, which crowd sources freelancers to complete paid tasks typically related to brand placement and pricing in stores.

g. Paperless ticketing - Apple's Concert Ticket+ system, which was granted a patent but could appear in the next generation of iPhone devices. It's too early to tell exactly how this system will use location data, but because of the additional "benefits" described, it could be to create ad hoc networks and various events such as concerts or conferences.

h. Ad hoc networking - Apple's iGroups patent, also granted recently. Enabled mobile devices (e.g., iPhone) could be detected by a "master" device at an event and the owner offered the opportunity to join an ad hoc network.

Potential Geoinformation Based Application

The market analysis performed by several researches identified four set of potential geoinformation based application that is going to be huge in the near future for the mobile mass market. The application categories are:

i. Overlayed system services
ii. Overlay Globes
iii. Image Delivery
iv. Change Detection

These applications are fundamentally using earth observation images as the base layer of the application, which is then topped up with other types of geoinformation.

a. Overlaid system services - It contains applications which use images overlaid with additional data to provide customers with an increased level of information. Primary use is as upgrade for the LBS now. Typical use of overlaid services is:

   - Direct access on personal devices (e.g. mobile, tablets)
   - Emailed to other party/people
   - Posting on social networks

b. Overlay globes - In this application category, a map of the entire world is created (both 2D and 3D), and overlaid with information, such as providing very accurate position information, street information, yellow pages information etc. The key to the overlay globe is that a high resolution image of the earth is overlaid with all additional information associated with each location in the globe. This category is really about all the information that can be incorporated into a virtual globe (which would also include 2D and 3D imaging) be accessed through accurate positioning in the globe.

c. Image delivery - The delivery of current and historical geospatial imagery for the government, commercial and research applications collected earth observation satellites intended to match the customers' demand at any location on the Earth. Although, it is now currently in service but the image delivery is not a up-to-date images.

d. Change detection - It contains applications which use change detection technique to provide customers with information on the changes occurred on targets after a specific event (i.e.: disasters). Precise information on the geographic coordinates are requested as well as good spatial resolution and fast delivery of products.

THE MISSING LINK

The missing link between geoinformation and the mass society now are:

i. Up-to-date Images of the World

   Earth observation will be acting as the base layer of geoinformation, up to now there are no known capabilities for an earth observation image provider to supply an image of a point that will be refreshed daily commercially. For the mass market, images older than a few days have no or very little value.

ii. Up-to-date Geoinformation

   The geoinformation of a point must be refreshed as soon as possible to have a value to the mass market. Information distributed are meant to be useful to the recipient, that is if the content are new and will be refreshed again in a few hours

iii. Relevant Geoinformation

   The mass market needs to have relevant information delivered to them. People are annoyed if the information given to them is useless although it is very valuable for another party. For example, a service provider delivers a message about a landslide on the north bound PLUS highway to a person in Perth.

iv. Geoinformation by Request from the Service Provider.

   Geoinformation is best to disseminate by request of the mass market (pull service). Mass market will be really pleased if the geoinformation they request are accurate, timely and presented with a high resolution earth observation image. To the public a picture speak a thousand words and information on the image is a bonus.

CONCLUSION

Although geoinformation has been around since the day of the Pharaohs in ancient Egypt, it has never really been utilized by the mass society. The only main utilizer of geoinformation is the government and medium to large enterprises which have the capabilities in procuring the highly priced images. Not to blame the earth observation image provider, but it is well known to the public, to establish a space infrastructure (space segment, ground segment and launch campaign) is extremely costly and exorbitant. Delayed and postponed mission caused by funding issues are common in the business.

In February 2005, Google Map was launched by Google. The site led a massive online geoinformation revolution. The mass society suddenly is woken up to the importance of geoinformation through earth observation images. All of a sudden, almost all online business has their coordinates and map linked with the Google Map. Google Map now are the essential tool in geoinformation for business and the site also is a major reference for the public to do online reconnaissance before getting on the road to a destination.

The mobile revolution started since the introduction a smart phone called the iPhone by Apple in June 2007. The invention later sparked more fire with the creation of the Android OS by rivals lead by the search engine, Google. Android seems to be more disruptive than iOS since it is compatible with all other smartphones. The capability of smartphones excepting large files and in high resolution is the catalyst of having geoinformation to the mass mobile society.

Since the mass society now are having a smartphone that have the capability to receive high resolution pictures, earth images can be delivered directly to their mobile devices. Apple and Android, both are having their own platform to create apps are the perfect channel for geoinformation type of apps to penetrate to the mass mobile society. Applications created by integrating earth images, GPS coordinate and useful spatial information is readily to be delivered to the mass mobile public. Not to mention, access to the net via mobile devices is getting faster with the 4G network and it is expected to be faster in the next decade.

The only limitations to disseminate timely, accurate, up-to-date and on demand geoinformation are the costly space infrastructure, and the will of geomatitions to venture and exploit the application platform provided by Apple and Android to create a killer geoinformation apps for the mobile society.

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PENGHASILAN DAN PENAMBAHBAIKAN PANGKALAN DATA GEOSPATIAL SKIM PERLOMBONGAN DAN KUARI JABATAN MINERAL DAN GEOSAINS (JMG)

MELALUI KERJASAMA DENGAN

PUSAT INFRASTRUKTUR DATA GEOSPATIAL NEGARA (MaCGDI)

Disediakan oleh:
Seksyen Penyelidikan dan Pembangunan
Pusat Infrastruktur Data Geospatial Negara (MaCGDI)
Kementerian Sumber Asli dan Alam Sekitar
Email: r&d@macgdi.gov.my
Laman Web: http://www.mygeoportal.gov.my

Abstrak

Keperluan untuk mengwujudkan satu pangkalan data GIS yang bersepadu adalah menjadi asas yang terpenting dalam dalam sesebuah organisasi. Pewujudan pangkalan data ini akan memudahkan pengemaskinian, penyebaran serta pengurusan segala maklumat yang berkaitan. Dalam hal ini, pengguna hanya akan merujuk kepada satu pangkalan data sahaja sebagai sumber rujukan bagi mendapatkan maklumat yang diperlukan.

Artikel ini diterbitkan bagi menerangkan usaha Jabatan Mineral dan Geosains (JMG) menerusi kerjasama dengan Pusat Infrastruktur Data Geospatial Negara (MaCGDI) dalam menambah baik maklumat geospatial yang dimiliki dengan mendigitalkan pelan hardcopy perlombongan dan kuari menjadi sebuah pangkalan data geospatial yang lengkap maklumat atributnya.

Pengenalan

Data-data pelan *hardcopy* yang berada dalam simpanan mereka mula dimamah usia dan dikuatiri akan rosak. Bagi penyediaan data digital pula, ia dibangunkan hanya sekadar dalam bentuk *point* dan maklumat atributnya adalah tidak lengkap. Sehubungan dengan itu, MaCGDI sebagai organisasi yang dipertanggungjawabkan dalam pembangunan data geospatial telah berkolaborasi bersama pihak JMG dalam membangunkan data-data geologi yang berada dalam simpanan mereka dengan cara mendigitalkan semula data-data tersebut.

Sehubungan dengan itu, satu *kick-off meeting* telah diadakan antara pihak JMG dan MaCGDI pada 21 Mac 2012 di Ibu Pejabat Jabatan Mineral dan Geosains Malaysia, Kuala Lumpur. Mesyuarat tersebut telah dipengerusikan oleh Tuan Haji Za'im Abd Wahab, Timbalan Pengarah

(PPO) JMG. Dalam mesyuarat tersebut pihak MaCGDI telah menerangkan metodologi pemprosesan data *conversion* seperti pengimbasan, *geo-referencing, digitizing* dan kemasukan atribut daripada pelan *hardcopy* sehingga terbentuknya pangkalan data.

Antara perkara-perkara yang telah dipersetujui adalah seperti berikut:

a) Pihak JMG akan menyediakan pelan lombong dan kuari dalam bentuk digital;
b) Perancangan pendigitan 300 pelan *hardcopy* Peta Skim Lombong dan Kuari;
c) Data-data yang bakal dibangunkan dibuat dalam format gdb yang dijana daripada perisian ArcGIS mengikut struktur data MS1759;
d) Proses *georeference*, pendigitan dan kemasukan atribut akan dijalankan oleh pihak Seksyen R&D, MaCGDI; dan
e) Mengadakan satu bengkel khas kepada kakitangan JMG berkenaan dengan proses-proses berkaitan yang akan dikendalikan oleh pihak MaCGDI.

Isu dan Masalah

Sebelum ini, kawasan-kawasan skim lombong dan kuari sekadar ditanda dengan *points* di tempat-tempat yang bersesuaian dalam Pangkalan Data berpandukan kepada Peta Topografi dan Peta Tempatan. Sebenarnya, sempadan-sempadan kawasan kerja perlombongan dan kuari dan keluasannya tidak diketahui dengan jelas sedangkan hakikatnya jika disebut suatu kawasan kerja perlombongan dan kuari ia sepatutnya meliputi suatu limitasi atau persempadanan beserta dengan maklumat-maklumat atribut yang berkenaan.

Di samping itu, terdapat juga di sesetengah kawasan yang mana pelan *hardcopy*nya tidak mempunyai maklumat koordinat pada kawasan *stockpile* atau kawasan kerja-kerja perlombongan dan kuari. Ini akan menimbulkan permasalahan kerana lakaran kawasan tersebut tidak sama kedudukannya dengan yang berada di lapangan.

Projek Perintis

Bagi permulaan, satu projek perintis telah dijalankan dengan melibatkan data kawasan kuari dan lombong negeri Terengganu dan Negeri Sembilan seperti Jadual 1 di bawah:

Jadual 1: Data kawasan kuari dan lombong di negeri Terengganu dan Negeri Sembilan

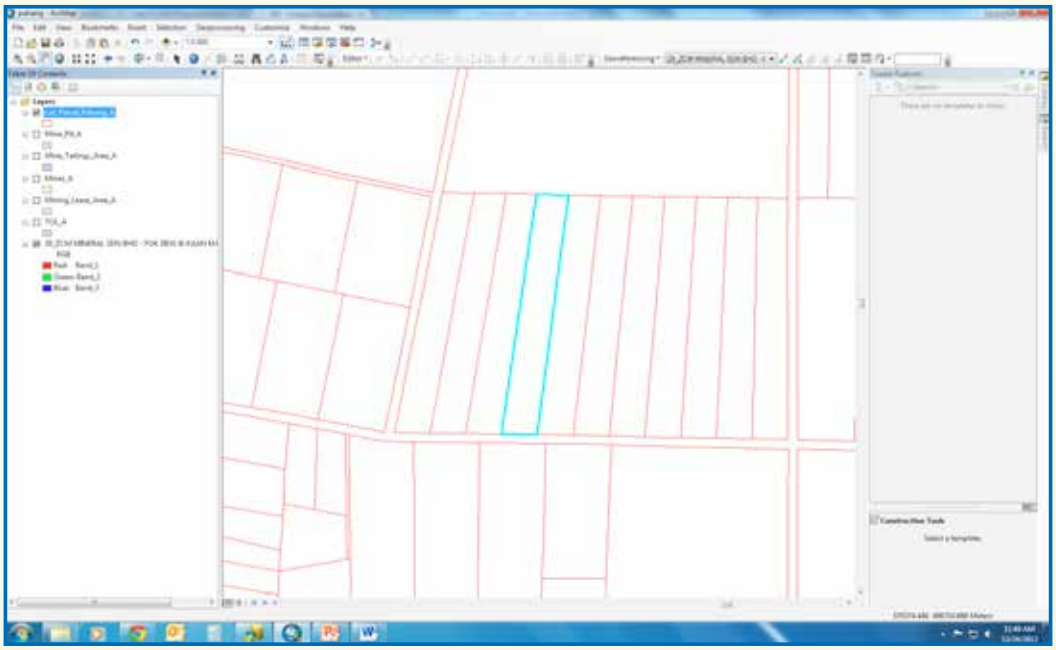
Negeri	Pelan Lombong	Pelan Kuari
Terengganu	19	16
Negeri Sembilan	13	15

Dalam masa yang agak singkat, data spatial bagi peta lombong tersebut telah berjaya diwujudkan melibatkan proses seperti berikut:

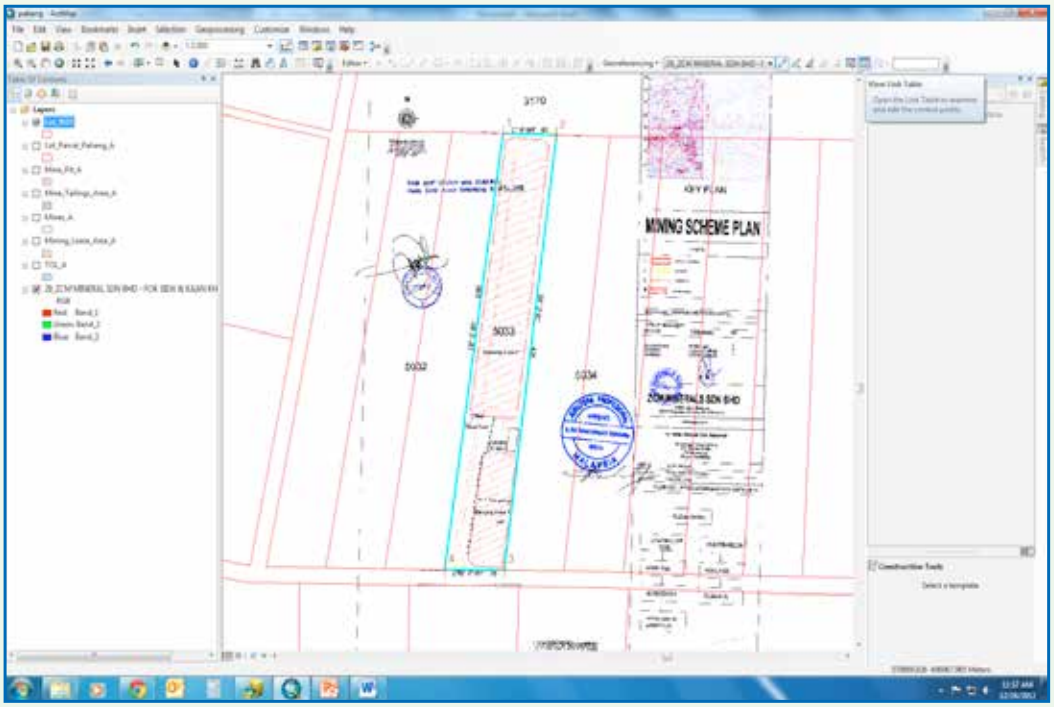
i. Proses *georeferencing*;
ii. Proses pendigitan; dan
iii. Proses kemasukan atribut

Proses *Georeferencing*

Proses ini dilakukan bertujuan untuk menyamakan rujukan pelan *hardcopy* yang diimbas dengan rujukan unjuran yang hendak digunakan pada perisian ArcGIS. Teknik penandaan titik kawal antara lot yang sama pada pelan yang diimbas dengan data Pangkalan Data Ukur Kadaster (PDUK) yang mengguna pakai sistem koordinat GDM 2000 MRSO.



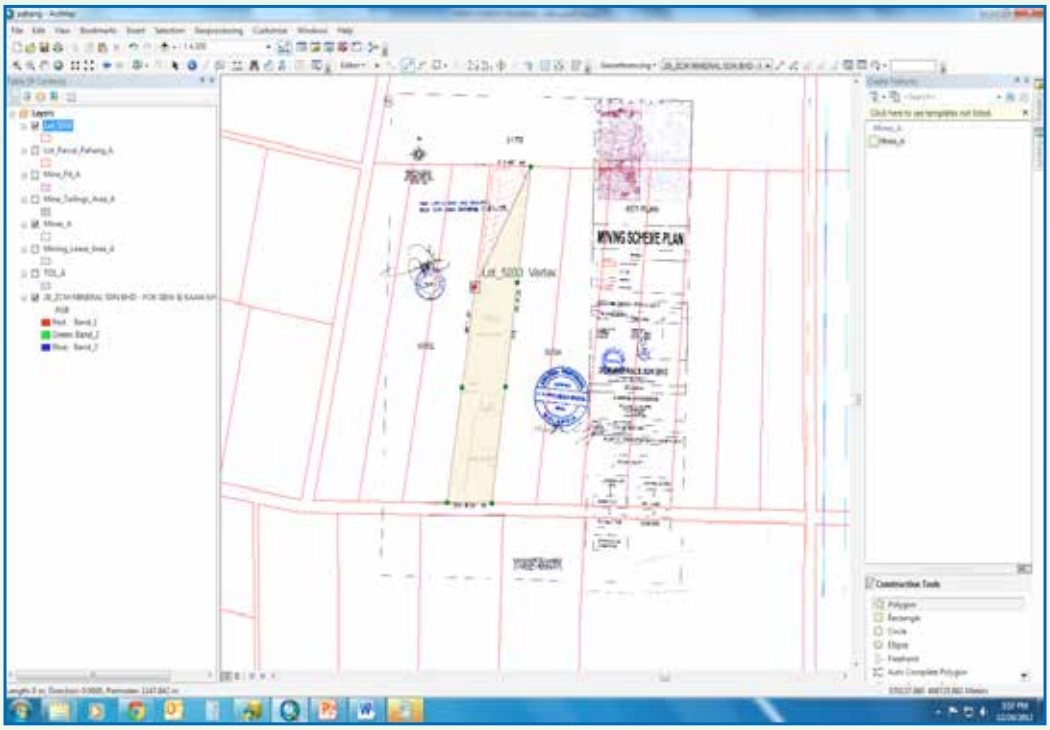
Rajah 1: Pangkalan Data Ukur Kadaster (PDUK) yang dipaparkan dalam bentuk digital



Rajah 2: Pelan *hardcopy* yang diimbas yang di*overlay* bersama data PDUK

Proses Pendigitan

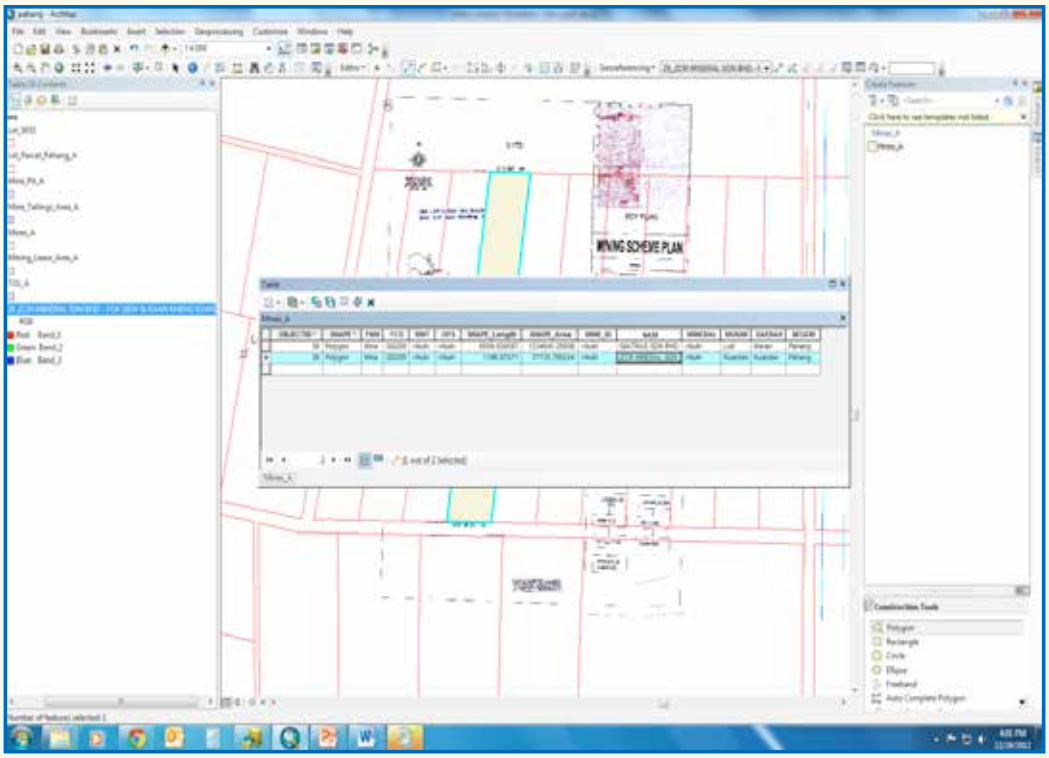
Proses ini dilakukan bertujuan untuk mendigitalkan pelan *hardcopy* yang telah diimbas. Saiz bagi pelan digital (data vektor) adalah lebih kecil berbanding dengan pelan *hardcopy* (data raster) dan dapat menjimatkan penggunaan *harddisk* di samping ia boleh dimanipulasi untuk kerja-kerja GIS yang lain.



Rajah 3: Proses pendigitan dilakukan di atas lot yang terlibat

Proses Kemasukan Atribut

Proses ini dilakukan bertujuan untuk memasukkan maklumat atribut ke dalam jadual yang disediakan. Antara maklumat yang dimasukkan adalah nama lombong, nama syarikat, luas kawasan kerja, daerah, mukim dan sebagainya. Maklumat tersebut dapat digunakan dalam melakukan *query* bagi membuat keputusan yang tepat.



Rajah 4: Proses kemasukan atribut pada *attribute table*

Lawatan Tapak

Pada 2-3 April 2013, pihak MaCGDI dan Ibu Pejabat JMG dengan kerjasama JMG NSM telah membuat lawatan ke empat (4) lokasi kuari seperti berikut:

i. Mukim Labu, Seremban-Syarikat KT ONG Engineering Sdn.Bhd
ii. Mukim Sentul, Seremban-PATI Nilai Quarry Sdn.Bhd
iii. Mukim Ayer Kuning, Bukit Tok Saih-GPS Quarry Sdn.Bhd
iv. Mukim Gemenceh, Tampin-Intisari Dagang Sdn.Bhd

Tujuan lawatan tapak ini diadakan adalah untuk mengenal pasti kedudukan kawasan kerja kuari dan *stockpile* adalah sama seperti yang dilakarkan di atas pelan. Proses mengenal pasti kedudukan kawasan tersebut dijalankan dengan menggunakan alat *Garmin Hand Held*. Beberapa koordinat dicerap di lapangan akan dijadikan panduan semasa proses pendigitan dilakukan kelak. Secara tidak langsung, acara lawatan tapak ini telah menjadi medan latihan bagi pegawai-pegawai dari JMG untuk mempelajari kaedah yang betul untuk mencerap dengan menggunakan peralatan tersebut

Pegawai-pegawai MaCGDI dan JMG sedang mendengar penerangan daripada pihak pengurusan syarikat kuari

Pegawai-pegawai sedang mencerap koordinat di lapangan

Pegawai dari Ibu Pejabat JMG sedang memberikan penerangan berkaitan kuari

Bengkel dan Latihan

Pada 25 hingga 26 Jun 2013, satu kursus telah dijalankan oleh pihak MaCGDI dengan kerjasama JMG yang bertajuk Kursus Pendigitan Pelan Skim Lombong dan Kuari bertempat di bilik COE, MaCGDI. Objektif kursus tersebut adalah untuk memberi pendedahan tentang konsep pengoperasian perisian ArcGIS serta memberi kemahiran dalam pendigitan dan penyediaan data set bagi pelan skim lombong dan kuari. Kursus ini telah dihadiri oleh 20 orang pegawai JMG dari seluruh Malaysia.

Antara tajuk syarahan yang disampaikan adalah Pengenalan Kepada ArcGIS, Pangkalan Data ArcGIS, Metadata, Sistem Koordinat dan Transformasi dan juga Latihamal Pendigitan dan Penyediaan Data Set Pelan Skim Lombong dan Kuari. Tenaga pengajar yang terlibat dalam kursus ini adalah dari kalangan pegawai-pegawai Seksyen Penyelidikan dan Pembangunan, MaCGDI.

Pegawai dari MaCGDI sedang menyampaikan syarahan

Pegawai dari MaCGDI dan JMG bergambar kenangan

Majlis penyampaian sijil kepada perserta bengkel

Penutup

Penyediaan data set pelan Skim Lombong dan Kuari serta integrasi data *spatial* dan *non spatial* seperti ini merupakan salah satu kerja-kerja pembangunan awal maklumat spatial ke arah memantapkan maklumat yang dimiliki oleh pihak JMG. Selain itu, data seperti ini merupakan sumber data geospatial yang baik dan komprehensif untuk banyak kegunaan perancangan dan pemantauan di peringkat negeri dan daerah.

Kerjasama yang dijalankan antara MaCGDI dan JMG adalah baik untuk kedua-dua agensi dan menunjukkan salah satu usaha jabatan ke arah konsep perkongsian data melalui pembangunan data geospatial yang dihasrat dan dipelopori oleh MaCGDI di bawah NRE.

GIS SANA-SINI

Lawatan Sambil Belajar Mahasiswa Geoinformatik, Universiti Teknologi Malaysia ke MaCGDI

Tempat :
Bilik Mesyuarat Permata, Aras 7, MaCGDI

Tarikh :
30 JAN 2013

Tujuan: Untuk memberikan pendedahan kepada mahasiswa peranan GIS yang diguna pakai di Malaysia dan memupuk minat mahasiswa terhadap teknologi GIS yang semakin berkembang maju.

Lawatan Teknikal MaCGDI ke Telekom Malaysia

Tempat :
Bilik Mesyuarat Cempaka, Bangunan TM BRF, Jalan Tun Sambathan, Kuala Lumpur

Tarikh :
18 FEB 2013

Objektif :

i. Menjalinkan hubungan yang lebih erat antara MaCGDI dengan Telekom Malaysia dan mengetahui secara terperinci mengenai Aplikasi GIS yang telah dibangunkan oleh Telekom Malaysia iaitu SmartMap™.

ii. Membincangkan Isu Perkongsian Data antara pihak MaCGDI dan Telekom Malaysia.

Lawatan Teknikal Pegawai MaCGDI ke Perbadanan Putrajaya

Tempat :
Bilik Angsana, Aras 5, Blok A, Perbadanan Putrajaya

Tarikh :
27 FEB 2013

Objektif : Mendapatkan informasi daripada Unit GIS, Perbadanan Putrajaya mengenai maklumat atau data bagi kategori *Built Environment* yang terkini di Putrajaya dan untuk mengetahui dengan lebih terperinci kemajuan GIS dalam membantu pembangunan Putrajaya. Lawatan ini diadakan bagi membincangan isu perkongsian data GIS terkini yang boleh diguna pakai oleh agensi lain.

Laporan Akademik Universiti Stuttgart, Jerman ke MaCGDI

Tempat :
Bilik Mesyuarat Permata, Aras 7, MaCGDI

Tarikh :
8 MAC 2013

Objektif : Untuk mengetahui pelaksanaan aktiviti geospatial dari aspek penggunaan standard dan perkongsian data geospatial menerusi MyGDI.

Lawatan ini disertai oleh 35 orang pelajar termasuk beberapa orang kakitangan Universiti Teknologi Malaysia (UTM).

Lawatan Teknikal Jabatan Kejuruteraan Biologi dan Pertanian, Fakulti Kejuruteraan, Universiti Putra Malaysia ke MaCGDI

Tempat :
Bilik Mesyuarat Permata, Aras 7, MaCGDI

Tarikh :
26 MAC 2013

Tujuan lawatan ini adalah untuk menambahkan pengetahuan dan menarik minat pelajar terhadap bidang GIS dan mengetahui fungsi dan objektif penubuhan.

PROGRAM MOH KITE *ONLINE*, MUDAHNYA!

EDISI MANJUNG PERAK

Program Moh Kite *Online*, Mudahnya! Edisi Manjung, Perak telah diadakan pada 23 Mac 2013 di Dewan Merdeka, Majlis Perbandaran Manjung, Manjung Perak. Program yang berlangsung selama sehari ini telah dirasmikan oleh YAB Dato' Seri DiRaja Dr. Zambry bin Abd.Kadir, Menteri Besar Perak. Pameran ini disertai oleh pelbagai kementerian, agensi dan jabatan dalam perkhidmatan awam. Antara badan kerajaan yang telah mengambil bahagian dalam pameran ini adalah Kementerian Pembangunan Wanita, Keluarga dan Masyarakat (KPWKM), Jabatan Kemajuan Islam Malaysia (JAKIM), Jabatan Kerajaan Tempatan (JKT), Kementerian Sumber Manusia (KSM), Bahagian Teknologi Pendidikan (BTP), Suruhanjaya Komunikasi dan Multimedia Malaysia (SKMM), Jabatan Pengangkutan Jalan (JPJ), Jabatan Pendaftaran Negara (JPN), Suruhanjaya Pilihanraya Malaysia (SPR), Kumpulan Wang Simpanan Pekerja (KWSP), Lembaga Hasil Dalam Negeri Malaysia (LHDNM), Kementerian Kesihatan Malaysia (KKM) dan Perbadanan Tabung Pendidikan Tinggi Nasional (PTPTN).

Tujuan utama program ini adalah seperti berikut:

i. Mewadahkan pelbagai inisiatif ICT masa kini seperti program ETP NKEA CCI E-Government, MySMS, portal MyGovernment, inisiatif MyIDENTITY dan lain-lain inisiatif perkhidmatan *online* Kerajaan kepada penduduk setempat melalui kemudahan PI1M dan Kampung Tanpa Wayar yang disediakan di tempat tersebut;

ii. Meningkatkan kesedaran mengenai perkhidmatan *online* kerajaan dan kemudahan Pusat Internet dan Kampung Tanpa Wayar yang disediakan kepada penduduk setempat;

iii. Meningkatkan kesedaran penggunaan aplikasi *online* Kerajaan kepada penduduk kampung, khususnya aplikasi yang terus kepada rakyat dan perniagaan; dan

iv. Mendapatkan maklum balas daripada penduduk kampung tentang cadangan-cadangan lain untuk meningkatkan lagi sistem penyampaian perkhidmatan *online* Kerajaan.

Program ini banyak menyuntik pengetahuan kepada orang awam khasnya untuk menggunakan perkhidmatan *online* yang disediakan oleh kerajaan terutamanya pihak MAMPU yang telah menyediakan prasarana dan infrastruktur bagi memudahkan orang awam mengambil tindakan dengan hanya menggunakan perkhidmatan di hujung jari.

Kementerian Sumber Asli dan Alam Sekitar juga tidak ketinggalan dalam memperkenalkan perkhidmatan *online* yang boleh digunakan oleh orang awam seperti Portal NRE, Portal Public InfoBanjir, Ekopelancongan, eBMGPermit, APIMS *(Air Pollutant Index Management System)*, SyMBiosiS dan 1Malaysia Map. Program seperti ini dapat memberikan kesedaran dan mendidik orang awam tentang kemudahan dan infrastruktur yang telah disediakan oleh pihak kerajaan untuk mentransformasikan perkhidmatan kerajaan secara lebih efisien.

Lawatan Kerja Syarikat Perancis (SIRAS Company) ke MaCGDI

Tempat :
Pusat Infrastruktur Data Geospatial Negara (MaCDGI)

Tarikh :
8 APRIL 2013

Objektif lawatan ini adalah untuk mempromosikan teknologi geospatial terkini yang dibangunkan oleh syarikat tersebut.

Bengkel Pemantapan Kandungan dan Struktur MyGeoportal, MaCGDI

Tempat :
Hotel Residence, UNITEN, Kajang, Selangor

Tarikh :
9-11 APRIL 2013

Bertempat di Hotel Residence, UNITEN, Kajang, Selangor telah berlangsungnya satu Taklimat dan Bengkel Pemantapan Kandungan dan Struktur MyGeoportal. Seramai 20 pegawai MaCGDI terdiri daripada pelbagai seksyen telah menghadiri bengkel ini. Objektif utama bengkel ini adalah menghasilkan satu reka bentuk portal MaCGDI baru bagi memenuhi keperluan empat (4) kategori pengguna iaitu Pengguna Awam dan Pelajar, Agensi Kerajaan, Swasta dan Developer. Kesinambungan dari ini, dijangka Portal baru MaCGDI akan lebih mantap, memudahkan pengguna dan dapat memberi manfaat.

Lawatan MaCGDI ke Institut Oseanografi dan Sekitaran (INOS), Universiti Malaysia Terengganu (UMT)

Tempat :
Institut Oseanografi dan Sekitaran (INOS), Universiti Malaysia Terengganu (UMT)

Tarikh :
11 APRIL 2013

INOS telah ditubuhkan pada bulan Mei, 2001 dan berperanan khusus untuk melakukan kajian dalam penggunaan yang berterusan sumber marin dan pemuliharaan eko sistem laut yang berkesan. Objektif lawatan ini bertujuan untuk melihat aplikasi yang telah dibangunkan dan juga data yang terdapat di INOS, di samping mengwujudkan kerjasama antara kedua belah pihak dalam mengwujudkan kajian pangkalan data marin.

Lawatan kerja ini disertai oleh enam (6) orang pegawai MaCGDI yang diketuai oleh Puan Fuziah binti Haji Abu Hanifah, Pengarah MaCGDI. Rombongan lawatan telah disambut mesra oleh kakitangan Institut Oseanografi dan Sekitaran (INOS), Universiti Malaysia Terengganu (UMT) yang diketuai oleh Pengarah INOS, Y.Bhg. Prof. Dr. Mohd Lokman bin Husain. Penasihat Khas Naib Canselor UMT iaitu Y.Bhg. Prof. Dato' Dr. Aziz Deraman juga turut serta dalam sesi lawatan ini.

Rombongan telah diberikan sesi taklimat berkenaan Institut Oseanografi dan Sekitaran (INOS) yang disampaikan oleh Pengarah INOS dan pembentangan mengenai Marine Database yang disampaikan oleh pakar penyelidik Prof. Madya Dr. Aidy @ Mohd Shawal M. Muslim. Antara lain perkara yang disentuh adalah mengenai data dan maklumat lokasi kajian yang dilakukan oleh UMT dengan menggunakan pelbagai peralatan saintifik.

Rombongan seterusnya dibawa melawat ke Makmal Oseanografi Satelit dan Informatik Marin. Di Makmal Oseanografi Satelit dan Informatik Marin, rombongan berpeluang untuk meninjau pangkalan data Marin, analisis data spatial dan pembangunan pemprosesan imej digital dan kajian produktiviti lautan.

Bengkel Pengurusan Perubahan Bersama Pakar Runding MAMPU

Tempat :
Unit Pemodenan Tadbiran dan Perancangan Pengurusan Malaysia (MAMPU)

Tarikh :
15 APRIL 2013

Objektif bengkel ini diadakan adalah untuk memberi pendedahan kepada pegawai MaCGDI berkaitan pengurusan perubahan. Seramai 18 orang pegawai MaCGDI telah mengikuti bengkel ini. Puan Norhamimah binti Ibrahim selaku Pakar Runding Pengurusan Projek, MAMPU telah memberikan taklimat bagaimana mengaplikasikan kaedah ini untuk program MyGDI. Hasil daripada bengkel ini, pegawai telah mendapat banyak manfaat dari segi maklumat asas mengenai pengurusan perubahan.

Lawatan Teknikal MaCGDI ke NADI, ICU Jabatan Perdana Menteri Putrajaya

Tempat :
NADI, ICU Jabatan Perdana Menteri Putrajaya

Tarikh :
23 APRIL 2013

Satu lawatan teknikal ke NADI yang diketuai oleh Pengarah MaCGDI, Puan Fuziah binti Hj. Abu Hanifah telah diadakan pada 23 April 2013. Seramai enam (6) orang pegawai MaCGDI turut serta semasa sesi lawatan tersebut. Tujuan lawatan ini diadakan adalah untuk melihat pelaksanaan projek Sistem Maklumat Geografi (GIS) yang telah dijalankan oleh pihak NADI. Wakil pihak NADI telah membentangkan sistem aplikasi yang dibangunkan menggunakan GIS. Satu pasukan kerja telah dibentuk untuk membantu pihak NADI dalam memproses data geospatial.

LAWATAN TEKNIKAL PELAJAR ANTARABANGSA, UNIVERSITI TEKNIKAL MALAYSIA (UTEM), MELAKA KE MACGDI

Tempat :
Bilik Mesyuarat Permata, Aras 7, MaCGDI

Tarikh :
15 MEI 2013

Lawatan ini diketuai oleh pensyarah UTeM iaitu Prof. Nanna Suryana Herman. Tujuan lawatan sambil belajar ini adalah untuk mengetahui dengan lebih lanjut lagi berkaitan dengan Infrastruktur Maklumat Geospatial Negara (MyGDI) terutamanya dari segi pembangunan infrastruktur data geospatial yang merangkumi dasar dan peraturan.

Selain itu, lawatan ini juga memberi pendedahan kepada para pelajar objektif dan peranan MaCGDI dalam pembangunan geospatial negara.

FESTIVAL BELIA PUTRAJAYA 2013

Pada 26 hingga 28 Mei yang lalu, Kementerian Sumber Asli dan Alam Sekitar telah dijemput untuk turut serta di dalam pameran sempena Hari Belia 2013 anjuran Kementerian Belia dan Sukan. Kumpulan sasaran bagi program ini adalah belia-belia dari seluruh pelusuk negara. Antara yang mengunjungi *booth* MaCGDI adalah pelajar-pelajar dari institusi pengajian awam, institusi pengajian swasta, penjawat awam serta orang awam yang berminat untuk mengetahui lebih lanjut informasi berkaitan GIS dan SDI.

KEMENTERIAN SUMBER ASLI DAN ALAM SEKITAR

SIMPOSIUM MAKLUMAT GEOSPATIAL KEBANGSAAN

NGIS ke-6

GEOSPATIAL PEMACU WAWASAN NEGARA
GEOSPATIAL DRIVES NATIONAL VISION

17-18 Mac 2014

PUSAT KONVENSYEN ANTARABANGSA
PUTRAJAYA

Penganjur Utama :

Penganjur Bersama :

Dengan Sokongan :

BULETIN GEOSPATIAL SEKTOR AWAM

Format Dan Garis Panduan Sumbangan Artikel

Buletin Geospatial Sektor Awam diterbitkan dua (2) kali setahun oleh Pusat Infrastruktur Data Geospatial Negara (MaCGDI). Sidang Pengarang amat mengalu-alukan sumbangan sama ada berbentuk artikel atau laporan bergambar mengenai perkembangan Sistem Maklumat Geografi (GIS) di Agensi Kerajaan, Badan Berkanun dan Institusi Pengajian Tinggi.

Garis Panduan Untuk Penulis

1. **Manuskrip boleh ditulis dalam Bahasa Melayu atau Bahasa Inggeris.**
2. **Setiap artikel perlu mempunyai abstrak dan perlu ditulis dengan huruf condong (*italic*).**
3. **Format manuskrip adalah seperti berikut:**

Jenis huruf (*font*)	**:**	**Arial**
Saiz huruf bagi tajuk	**:**	**12**
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Langkau (*spacing*)	**:**	***single***
Margin	**:**	**Atas, bawah, kiri dan kanan = 2.5 cm**
Justifikasi teks	**:**	**Kiri**
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4. **Sumbangan hendaklah dikemukakan dalam bentuk *softcopy* dalam format *Microsoft Word*.**
5. **Semua imej grafik hendaklah dibekalkan dalam format .tif atau .jpg dengan resolusi tidak kurang daripada 150 d.p.i.**
6. **Segala pertanyaan dan sumbangan hendaklah dikemukakan kepada :**

Ketua Editor
Buletin Geospatial Sektor Awam
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