KERTAS KERJA 2

Tajuk : **Transformation Of Malaysian Armed Forces (Maf) Towards Spatially Enabled Forces**

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Synopsis

Information Technology and Telecommunication Technology (ICT) has enabled applications as Geographic Information System (GIS) been implemented in Service Oriented Architecture (SOA) using a cloud computing platform. ArcGIS Online is an example of the application of GIS cloud collaboration services provider agencies to develop data catalog, display and share geospatial information online. Users are able to select the output of the system such as display, web feature service, a web mapping service, mobile and embedded display application folder to an existing website. Defence Geospatial Division (BGSP) as the agency that have been tasked to provide map and chart to the Malaysian Armed Forces (MAF) also change their roles not only supplying map and chart we also provide services towards geospatial data and information. The current technology is rapidly changing, where it drives the MAF to move forwards and applying the latest technologies to its organization. BGSP at this time already has the ability to support MAF using multiple platforms from hardcopy map, web services and also field support capabilities. This paper will present the journeys of MAF towards changes of geospatial capabilities and the challenges faced during the implementation of spatially enabled forces.

1. Introduction

Geographical Information System (GIS) is a computer system capable of capturing, storing, checking, integrating, manipulating, analyzing and displaying data in digital form related to the position of the earth surface. GIS development has grown in line with the rapid development of technology during the past decades have expressed specific challenges in storage and spatial data analysis particularly in defence and security. It also acts as an important tool in the process of problem solving and decision making.

Facing a rising tide of data and a growing demand for dynamic, time-sensitive information about specific areas of the world, BGSP has decided it needed a modern service-oriented architecture (SOA)-based system to speed delivery of data and products to MAF and give them the best tools to build custom products themselves. The Current developments of GIS technology rapidly changed how the MAF conduct operations. With the transformation of MAF into Network Centric Forces under the programmed of Fourth Dimension MAF (4D MAF), change is rapidly coming to how the MAF develops, work with and use of geospatial technology and GIS is at the forefront of the transformation. This transformation also enhancing the conventional war-fighting force, which now implementing its Fourth Dimension Malaysian Armed Forces (4D MAF) capability program. The strategic 4D MAF plan have three key elements – joint force, information superiority and multi-dimensionality in subsurface, surface, air and information realms.

2. The Role Of BGSP In Geospatial Support Of The MAF

The current development of GIS had initiated BGSP to transform from merely a maps delivery cell into a more structured and capable division in JUPEM to provide support and services by mean of production centric, data centric and most importantly moving towards a service centric organization.

The role and function of BGSP are as follows:

a. Supporting the warfighter by enabling the mission and protecting military forces.
b. Providing information and services to ensure the safety and security of our nation.
c. Supporting safety of navigation in the air, land and on the sea.

d. Delivering strategic information that helps the armed forces stay informed and make decisions on a variety of topics including global issues, counterterrorism, counter-proliferation and other national security issues.
e. Supporting the armed forces and government during humanitarian and disaster relief and recovery operations at home and abroad.
f. Collecting, verifying, and maintaining foundation data used to support the geospatial intelligence mission.
g. Providing real-time data and operational context about what is happening on the battlefield.

BGSP's geospatial mission supports three main customers which is the army, navy and air force, also other security agencies and intelligence community partners when applicable. In order to support geospatial mission, BGSP are responsible for providing timely, relevant and accurate imagery, geospatial information and products collectively known as geospatial intelligence to support MAF. The threats to national security continually evolve, as do the tools and skill sets needed to respond.

In order to fulfill this responsibility BGSP has taken necessary steps to restructure organization to be focus and concentrate all effort into it main mission to deliver task as follows:

a. Production of various maps including thematic maps.
b. Restructure data center to support Ministry of Defence and network Centric main data center for the MAF.
c. Providing various web service functionality including mobile capabilities to the customer.
d. Proving field geospatial support through our GeoSpatial Mobile System (GSMS) including deployment of Unmanned Ariel Vehicles (UAV) for real time data acquisition in specific operation areas.

3. Activation of Military Mapping Committee (MMC)

On 22 September 2013, MMC has officially been renamed as Defence Geospatial Committee (DGC) prior to this the MMC was in hibernate for almost 15 years as the MAF at that time was satisfied with the mapping support from JUPEM. However with the current development and transformation of MAF, the operational need of the MAF had becoming more complicated and sophisticated and thus also changes to the employment of equipment and weapons system used. This development has prompted MAF to put forward their data needs and also various

types of geospatial requirements to BGSP. The data structure and mapping products currently requested and forwarded to the DGC are as follows:

a. Maps Requirement

(1) Topographic Line Map (TLM)
(2) Common Operation Maps (COM)
(3) Facilities Camp Map
(4) Crash Map for Safety of Airport
(5) Special JOG of Scale 100,000 using Lorik Software
(6) Orthophoto.

b. Data

(1) Vector Interim Terrain Data (VITD) for various analysis
(2) VMAP Level 1,2,3 including 3D capabilities
(3) Various obstacle for Air Flight

c. Analysis/ Others Services

(1) Terrain analysis
(2) Obstacle
(3) Line of Sight
(4) Inundation

4. GIS Fuel BGSP Responsibilities

The uGeo For Defence programme framework was developed to provide all necessary geospatial support to the MAF. The development however was approved in stages, to allow for BGSP to be ready to acquire these defence geospatial capabilities. All development components such as people, process, technology and information are now undergoing intensive development and planning in order to achieve the capability required.

In the Proof of Concept (POC) and initial capability stages of the program, BGSP's capabilities had focused to provide specialized products for use only at the upper command levels of the MAF. However todays with powerful publication, technology on servers makes geospatial capability available throughout the area of operations. The network centric development of the MAF moves information more quickly, where by data from provider in the field to a geospatial analysis

personnel at Headquarters will be done with online application. The latest information is used for operation at all echelons in the theater of operations. As a result, the MAF will be providing with better, faster and more informed decision. The uGeo for Defence programme now has the capability of more integrated Service Oriented Architecture (SOA) and this provide the key enabling and technology foundation for BGSP to support and integrate with the network centric development of the MAF.

5. Ugeo For Defence Current System Capabilities

JUPEM provide the principle support and back up for this programme. The E-Mapping, Multipurpose Cadastre And Marine Geodetic will contribute more data to The Ugeo System. Other supports for this programme are:

a. The Malaysian Centre For Geospatial Data Infrastructure (Macgdi) that integrate in The National Geospatial Databases will provide more geospatial data that would then be processed to Defence Geospatial Data Models. Since these systems are designed to utilize SOA as a foundation, it is anticipated that the programme will not encounter much problem when integrating with these systems.

b. International Partners Such As Defence Geographic Centre (DGC) Of UK And DIGO Of Australia Plays A Key Role In Providing Geospatial Support To Our Troops In The Overseas Mission Where They Are Also Involved.

c. Commercial Element Is An Alternative In Case Of Not Being Provided With Relevant Geospatial Data That Meets MAF Demands.

All These Data And Information Will Be Possessed At Geospatial Fusion Centre And Then Distributed To MAF Defence Systems Using Network Centric Operation (NCO) Platform.

The Ugeo programme also provides field geospatial support to the field. we are now equipping the GSMS with UAV for mapping for area of operation. the platform of geospatial fusion centre and field geospatial capability will significantly contribute to geographic intelligent development in terms of information superiority that consequently leads to decisive decision capability. the delivery of an ugeo for defence capability will be an evolutionary process and comprises the following steps:

a. Initial Capability: BGSP have already initiated a number of projects which will de-risk the overall programme and provide

an initial capability by end year 2011, these include the vision and strategy necessary to underpin the programme, an enterprise dgis implementation plan, basic geospatial information development and the delivery of geospatial mobile system.

b. Transitional capability: Initially, is planned that the main components of uGeo for Defence would be funded under the 10th Malaysia Plan for delivery of a transitional capability by year 2015. However due to budget constraint, the initial part of transitional capability would be developed and it is parallel with the development of NCO.

c. Mature capability: The remaining part of transitional capability will be provided in this phase. This subsequently evolving to deliver a mature capability by year 2020 and will be achieved when uGeo for defence is embedded into MAF culture.

6. BGSP Current Capability

With the existing set up, BGSP have multi capability to support MAF. The capabilities are as follows:

a. Produce defence product for MAF Operation such as vector interim terrain data (VITD), vector Map (VMap), Topographic Line Map (TLM), Common Operation Map (COM) either hardcopy or softcopy using GeoPDF format.

b. Web based services either using ArcGIS server or ArcGIS online to give support to MAF. ArcGIS Server are hosting restricted information where by ArcGIS online will be used for online updating which is the services using cloud computing technologies. Most of the data park in the server was seamless and easy for soldiers to use for planning purpose.

Now we capable to support MAF Operations such as the intrusion in Lahad Datu conflict. However, there are still have some constrain such as geospatial data and information integration within the agency, lacking of bandwidth for networking and doesn't have the standard Spatial Data Infrastructure (SDI).

7. Recommendation

In the future, it has been planned to equip the field geospatial support capability with other geospatial equipment such as Mobile Remote Sensing Receiving Station, Mobile Production System and Geospatial Deployable System for the field support of MAF. Other capabilities consist of:

a. 3D Visualization
b. Disaster Management using live feed from agency
c. Acquisition of mobile data
d. Crowd sourcing technology
e. Appliance server (mobile)
f. Developing Defence SDI
g. Operation room

8. Conclusion

'Spatial enablement' requires the fulfilment of three distinct outcomes:

a. The existence and availability of a wide variety of spatial resources;
b. These resources must be in a form (structure and location) such that it can be made use of; and
c. These resources must be broadly and habitually applied to deliver lasting societal benefits.

In the longer term, this environment has the potential to become a vibrant marketplace for spatial resources, bringing us ever closer to achieving our goal of 'spatially enabled forces'.