

Volunteered Geographic Information Uses for National Security

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The use of Volunteered Geographic Information (VGI) can be leveraged to significantly enhance conventional intelligence capabilities for Department of Defense (DOD) and Homeland Security organizations. The upsurge of web-based technologies that allow individuals to voluntarily develop applications and provide information/intelligence offer numerous opportunities to improve:

1. Geospatial intelligence collection
2. Geospatial intelligence management
3. Geospatial intelligence retrieval
4. Geospatial intelligence dissemination

Understanding and improving the afore mentioned geographic information components will minimize current geospatial intelligence gaps and increase national security.

Additionally, VGI technologies currently being developed and used by the mainstream population can be adapted for use with multi echelon security access. The use of VGI type sites as a structure for collection, management, retrieval and dissemination of classified geographic information would provide DOD and Homeland Security organizations with quickly evolving and continually improving technologies.

Recent lessons learned from operations in conflict areas such as Afghanistan and Iraq have demonstrated a need for improvements in geospatial intelligence collection methodologies. VGI is a potential mechanism for increasing the number of sensors populating information databases. Technologies such as Wiki sites, Geo-tagged photographs and Google Earth currently provide civilians promoting peace and stability in conflict areas with the means to provide anonymous geographic information. Considerations in the realm of intelligence collection include how to control the population of the database and how to solicit specific needed information from the masses. However, careful investigation into potential incentives for volunteering information is necessary to fully understand the quality of the data provided.

The management of intelligence using newly developed technologies and methodologies is significantly different from conventional schemes. A number of questions arise: Should databases be populated without restriction? How is the accuracy of the information verified? Is a database manager needed to supervise the data

published? New technologies allow the users to become database managers. Sites such as Ebay and Amazon allow users to rate each other. Wikimapia allows users to change previously submitted VGI. Is it possible for a VGI site to be self correcting, self improving and self assessing in order to continually judge the quality of the information? A meticulous study of the supervision methods for the provided information is required.

Geospatial Intelligence retrieval challenges inherently arise from the possibilities of vast information collection. A powerful geospatial search engine that appropriately prioritizes information is essential for the efficient use of VGI. DOD and the uniformed services often need geospatial information for immediate response situations. The search engine should be able to conduct network analysis of requested information and analyze the spatial component of the data. Standardization of automated metadata inclusion is required to allow the users to query and access needed intelligence.

The compiled VGI must be able to be disseminated to others and visualized by the user. There must be interoperability between provided data formats and a common operating platform that can be efficiently interfaced by sensors and operators. DOD and Homeland Security users would require limited training if currently existing VGI collection methods were integrated. Sites such as Google Earth and Wikimapia are intuitively designed, have widespread use and are familiar to citizen sensors, organizational sensors and operators in need of information.

VGI has many compelling uses for operators that require geospatial intelligence for situational awareness. Police forces, fire departments, DOD and Homeland Security organizations require timely information during crisis or conflict. VGI can augment currently available information. The exploitation of citizens as sensors vastly increases the possible geo-intelligence collection capabilities for use by governmental organizations. A detailed examination of how VGI and associated technologies can improve the collection, management, retrieval and dissemination for these organizations could advance local and national level crisis reaction and security.

Authors Note: Additional interest in the use of VGI to enhance college level education.