IMSMA® Version 4: A Collaborative Approach

From July 24 to 27, 2006, the Geneva International Centre for Humanitarian Demining hosted a workshop in Murten, Switzerland, to introduce and discuss the release of the Information Management System for Mine Action version 4. Participants included management, operations and technology professionals involved in mine-action information management. During this workshop, results from IMSMA v4 pilot field tests were presented, v4 changes and innovations were explained, and a demonstration of IMSMA v4 with new handheld and Geographic Information System components was offered. IMSMA v4 reflects a collaborative effort to improve the accuracy and ease of mine-action information management in the field.

by Daniele Ressler [Mine Action Information Center]

The EOD IS-SURVEY, engineered by SWEDEC, is a wireless handheld computer unit that collects and stores data on the field to transfer to the IMSMA database.
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IMSMA is a licensed and registered trademark product of the Geneva International Centre for Humanitarian Demining, created as a database to assist in managing and standardizing mine-action data collection and information management. IMSMA has undergone several updates since its first release in 1999. The most recent version of IMSMA, v4, has gone through pilot tests in five countries and is being refined for distribution by the GICHD to all existing IMSMA users by the end of 2007. The information-management workshop hosted by the GICHD provided a forum to discuss, plan and ask questions about the then-forthcoming v4.

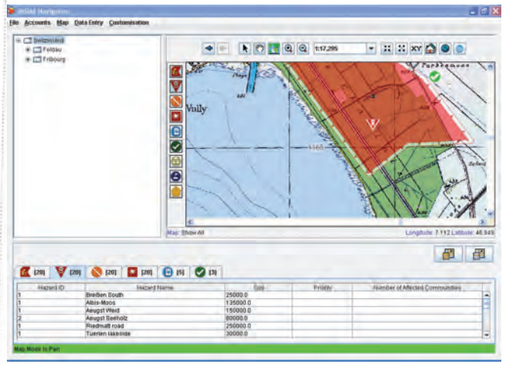
IMSMA v4: A Collaborative Effort

As Alan Arnold, Program Manager for the GICHD's Mine Action Information Systems and host of the July workshop, noted, IMSMA v4 is not simply an updated version of IMSMA v3, but is new and different in significant ways. The updates to IMSMA reflect an expanded effort utilizing the collaboration of various groups in a variety of subject areas of expertise.

System and program improvements. After feedback from field users was collected to determine how IMSMA could be improved, the GICHD completed an open tender process for the work required to redesign and develop a v4 application that would enhance IMSMA's capabilities as an information-management tool. FGM, Inc. assisted in providing information technology services to design some of IMSMA's updated program applications. Version 4 is written in the Java programming language, allowing it to be compatible with a variety of operating systems, including Linux, and IMSMA no longer requires users to have Microsoft® Office or Microsoft Access database capabilities.

Building on the concepts expressed in v3, v4 provides even greater flexibility and allows users to create a customized information-management system that suits the needs of their specific mine-action situation. One example of this is that, unlike previous versions of IMSMA, which offered only predefined forms, v4 allows users to create or alter all data-collection tools (e.g., forms and surveys), reports and elements. Version 4 provides some default forms with most of the elements that were in the v3 forms, but v4 now allows these to be changed.

Additionally, new forms can be completely designed locally and from scratch. Also, v4 users can add their own forms and elements to IMSMA, attaching them to the preferred "user-defined data fields" that already exist in the system. This allows users to customize the data collection process using locally produced forms and systems-access permissions.



Version 4 has added a GIS component that provides maps and satellite imagery, and organizes data around the concept of "location."
ALL SCREEN SHOTS COURTESY OF GICHD

Flexibility is furthered with the introduction of expanded language options. Using new language-translation features, v4 can be translated into virtually any language and currently ships with Arabic, English, French, Portuguese, Russian and Spanish. If there are system users with different language preferences, the shared system allows any of these languages to be used simultaneously and information to be listed multiple times in different languages. Users can also now add and publish locally created forms in other regional languages or dialects.

GIS and "locality" basis. One of the major updates in v4 is the integration of a Geographic Information System component. This addition provides a graphical map interface on the basic screen that is used to organize IMSMA data around the concept of "location." Data and reports are represented by symbols on the map found on the main screen and can be accessed by theme, report, incident, date or location for geographic reports and analysis. Multiple reports associated with a single location can be stored and evaluated cumulatively over time.

The University of Kansas' Department of Geography and Kansas Applied Remote Sensing Program joined the collaborative effort of v4, and the University's Matt Dunbar presented a module on GIS at the conference. The University of Kansas team has created a new and standardized set of humanitarian-mine-action symbols that are used in v4's display. They have also supplied joint operations graphic maps, Landsat satellite imagery, elevation data and population data into IMSMA v4 that are specialized for each country.

Handheld unit. A final innovation to IMSMA v4 is an additional handheld tool that allows field personnel to capture information and transfer it to their main IMSMA database with ease. The Swedish Armed Forces engineered the handheld unit through their Swedish Explosive Ordnance Disposal and Demining Centre and it consists of a handheld computer (Windows Mobile 5) with a Global Positioning System, laser rangefinder binoculars and a digital camera all connected by Bluetooth® wireless technology. Formally called the Explosive Ordnance Disposal Information System Survey Tool, the EOD IS-SURVEY allows users to:

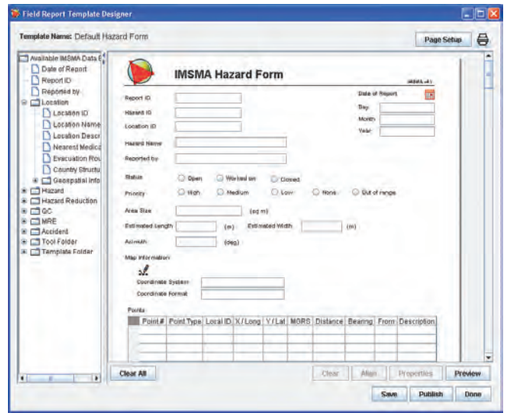
- Download IMSMA forms and data to the wireless handheld computer unit
- Enter data into forms while in the field during surveying (with location information from the GPS and the laser binoculars connected directly to the wireless handheld unit)
- Attach and save photos or other files (e.g., maps, gazetteers, dataset information) to or from the wireless unit
- Transfer all data back to the main IMSMA database

With the technical assistance of FGM, Inc., the IMSMA v4 developers, the mine-action eXtensible Mark-up Language was programmed into IMSMA v4 to allow for the transmission of standardized data between different information systems; maXML is the schema that links the metadata specifications and therefore the information between IMSMA (in Java) and the EOD IS-SURVEY (using a Microsoft product) by creating a common language. Unlike the handheld data-collection implementation used with v3, IMSMA v4 allows for the direct translation of data between the handheld and IMSMA program, making it easier to transfer information between the two.

The EOD IS-SURVEY has been field-tested in a number of locations and the team from the University of Kansas has also produced a formal report documenting these evaluations.

EOD IS-SURVEY Demonstration and Country Presentations

Two highlights of the conference were a hands-on demonstration of the new EOD IS-SURVEY handheld unit as the field survey and reporting tool for IMSMA v4 and presentations about the results of IMSMA v4 pilot testing in five countries.



Version 4 of IMSMA is flexible and has expanded language options, allowing users to create and alter forms and reports in order to collect and manage the data in the ways they prefer.

For the final EOD IS-SURVEY demonstration, participants spent the day outside and practiced using laser binoculars to plot a perimeter and transmit the coordinates into the handheld computer unit. The handheld unit allowed form fields to be filled out and saved or changed as needed. Coordinates appeared on the screen over a map of the area, resulting in the ability to accurately plot any physical locations deemed important.

After captured field data was saved and questions about the exhibition answered, participants returned to the conference room and observed the recently collected data being directly transferred from the EOD IS-SURVEY into the IMSMA v4 program and then organized for reports and analysis.

The potential applications of some of the new v4 features were discussed during country presentations, which described the results of pilot tests that began in the fall of 2005. In Burundi, data from various non-governmental organizations was entered into v4 to be organized and compiled for prioritization activities. Colombia reported that v4 provided the necessary decentralization of information management by allowing the program and forms to be specialized and changed for each region's needs; it was also safer to be able to electronically transmit data between regional centers and organizations rather than traveling through conflict zones. Jordan discussed using v4 as a tool for improved quality management and organizational coordination activities.

In the case of the Falkland Islands, the use of v4 will allow Argentina and the United Kingdom to coordinate and share national data for clearance efforts. Uganda's future goals for v4 highlighted the potential for IMSMA to not only operate within its national mine-action center but to also expand beyond mine action, with plans for the integration of health, refugee and development data to collect and manage disaster-management/early-recovery planning. In all five cases, the expanded language options were noted as important and useful.

Conclusion

Some of the changes in v4 offer potential improvements in mine-action information management by allowing flexibility, creativity and linkage of different systems in IMSMA. The integration of a fully functional GIS into the system allows users to navigate the database using the map rather than working directly in the database itself. Combined with the direct transfer of field data to IMSMA from the EOD IS-SURVEY tool, users will find that IMSMA v4 can help reduce data-collection errors, speeds up the integration of new data from the field and makes it easier to visualize the threat situation in a country or region. The updated v4 allows for new languages, the freedom to create and modify forms and reports, and the ability to combine and link data in advanced ways. The pilot test results from five countries reinforced the potential that v4 has to address a variety of different mine-action situations with its new malleable, customizable and innovative features.

The GICHD distributes IMSMA software at no charge and provides on-site training for its use. GICHD staff can transfer all data from earlier versions of IMSMA to the v4. New or updated equipment is not required for v4 and users do not need to purchase GIS software or licenses in order to use the mapping features. The GICHD, in collaboration with FGM, Inc., the University of Kansas and the Swedish Explosive Ordnance Disposal and Demining Centre have applied their efforts to create not just an updated version of IMSMA, but a different and innovative one.

Conference participants practice using the EOD IS-SURVEY and laser binoculars in an outdoor demonstration.

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