IMSMA V3.0: Experiences From the “IMSMA Diaspora”

Mohammed Qasim  
MACA

John Walker  
U.S. Humanitarian Demining Training Center (HDTC)

Follow this and additional works at: https://commons.lib.jmu.edu/cisr-journal

Part of the Defense and Security Studies Commons, Emergency and Disaster Management Commons, Other Public Affairs, Public Policy and Public Administration Commons, and the Peace and Conflict Studies Commons

Recommended Citation
Qasim, Mohammed and Walker, John (2003) "IMSMA V3.0: Experiences From the “IMSMA Diaspora”,"  
Journal of Mine Action : Vol. 7 : Iss. 3 , Article 9.  
Available at: https://commons.lib.jmu.edu/cisr-journal/vol7/iss3/9

This Article is brought to you for free and open access by the Center for International Stabilization and Recovery at JMU Scholarly Commons. It has been accepted for inclusion in Journal of Conventional Weapons Destruction by an authorized editor of JMU Scholarly Commons. For more information, please contact dc_admin@jmu.edu.
The Information Management System for Mine Action (IMSMA) V3.0 was released June 2003, and early experience with the system has been positive. Sellent features are summarized, including geographic information system (GIS) capabilities based on ArcView GIS.

Recommendations include operations-oriented training focusing on reporting information from IMSMA. The following article describes the new version and discusses local customization. The authors also describe upgrading to IMSMA V3.0 based on experience as IMSMA administrators and trainers within their organizations.

by Mohammed Qasim, MACA and John Walker, former trainer, U.S. DoD NDTC

Introduction

Information technology (IT) is a support function within the bigger world of humanitarian mine action. IT managers strive to use data and information to inform and shape decisions. Information, in turn, needs to be digested in order to make better mine action solutions. This expedites the following:

- Safe demining
- Impact, technical and completion surveys
- Quality control and assurance
- Mine risk education (MRE)
- Reliable, secure communications
- Training

Mine action is always evolving, which means the terms reflect. Humanitarian demining first focused on the physical removal of mines; worldwide, programs are now in place doing this. As managers shift attention to education and efficiency, information system people have a bigger job to do. The first job of a management information system (MIS) is to support Operations (Ops)—not create “data processing” capability, resulting in the well-known problem of “a lot of data but no information.” The IT team should also support headquarters administration, donor reports and interagency liaison as well as give 24/7 support to decision makers through timely and accurate information and analysis. So they need a good information system.

Information systems for mine action must be simple, economic, secure and stable. The system must be locally maintainable while following international norms and focus on the “bleeding edge” — not the “bleeding edge” — of technology. GIS and data export-import capabilities are essential. The system should support local languages and share information in UN languages, with full acceptance by the international mine action diaspora. Moreover, software should be easy to use and able to run on standard hardware.

The system meeting these criteria is IMSMA. developed at the Swiss Federal Institute of Technology in Zurich (ETHZ) with leadership by the Geneva International Center for Humanitarian Demining (GICHID). No mine action center (MAC) should operate without IMSMA.

IMSMA Background

The Swiss Ministry of Defense, through the Center for Security Studies and Conflict Research at ETHZ, sponsored IMSMA development as part of Switzerland’s commitment to humanitarian demining. The software development team (GD) developed IMSMA as a customized Microsoft Access database; any group using small-office PCs could use the system. In 1999, the UN Mine Action Service (UNMAS) declared IMSMA its standard mine information database. The GICHID, founded in 1998, began training and implementation as a partner with ETHZ. Using ArcView software, ETHZ developed IMSMA GIS, a custom version of ArcView optimized for mine action. GIS allowed presentation and analysis of mine action information (vector data) on maps and imagery (raster data). UNMAS and the U.S. government began encouraging use of IMSMA. IMSMA V2, developed and distributed from 2000 to 2002, added a tanking tool and improved the GIS engine. ETHZ’s development team was recognized by the Environmental Systems Research Institute (ESRI) for GIS work. Use of IMSMA by MACs accelerated. The U.S. Department of State and Department of Defense accepted it as their standard, fueling a “bleeding edge” — the expensive Demining Support System (DSS). ESRI worked with the GICHID to provide ArcView 3.2a to mine action programs, giving many lesser-developed countries their first GIS. Nicaragua and Afghanistan pioneered IMSMA use. Between 2002 and 2003, with at least 28 mine action programs running at once, IMSMA was the GICHID assumed responsibility for training and implementation support. ETHZ developers began work on the IMSMA/V3.0 system. IMSMA V3.0 took the “bleeding edge” of GIS technology. This will be an exciting and positive development.

ArcView and IMSMA GIS

ArcView, developed by ESRI in Redlands, California, is a well-known desktop GIS used worldwide by planning agencies, universities, corporations and anyone needing accurate geographic data. It has powered tools for querying spatial data.

ArcView GIS does not require special skills for basic use, although it does take training to become proficient. People experienced with geographic software (e.g., QGIS) and a GIS database (e.g., SQLite) should find the system intuitive. Many organizations with GIS experience should find IMSMA familiar.
Adobe Photoshop) or mapping programs such as FalconView learn quickly since they understand "layers" of data ("themes" in ArcView). Quantitative skills are useful, and a skilled SysAdmin may add functionality through custom ArcView extensions.

**IMSMA V3.0**

ETHZ developed IMSMA V3.0 between 2002 and 2003 and the GICHED released it in June 2003. This is a complete, well-organized and full-fledged information system. Advances include the following:

- **MRE management**
- **Contacts and organizations tables**
- **Data quality explorer**
- **MRE V3.0 strengthens structure, functionality, platform, security and performance. The final version of the IMSMA database was released on 29 July 2003.**
- **A new MRE module for the tracking and analysis of educational and outreach activities.**
- **A unified address and contact database for individuals and organizations.**
- **More than 70 summary and statistical reports in tabular and chart formats.**

**New Functionality and Decentralized Data Entry**

Getting past technical improvements, IMSMA V3.0 has more everyday functionality. This functionality includes the following points:

- **New MRE module for the tracking and analysis of educational and outreach activities.**
- **A unified address and contact database for individuals and organizations.**
- **More than 70 summary and statistical reports in tabular and chart formats.**
- **Enhanced data entry and editing tools.**
- **Improved query language (SQL), the International Organization for Standardization (ISO)-approved coding used in Oracle and other powerful database systems, is now used.**
- **The Microsoft SQL Server back-end is now more powerful, more secure and easier to back up and restore than older Microsoft Access versions.**

The IMSMA template reports enable MACOs to view IMSMA's reporting tools according to local requirements. Older versions provided fewer reports, and technical managers often called IMSMA a "black-box"—a put of data in the system, retrieve less from the database. This criticism has now ended.

Decentralized data entry works nicely at MACA. Grasping geographical areas of responsibility to Area Mine Action Centers (AMACs) and giving each AMAC responsibility for data entry streamlines synchronization with headquarters in Kabul. MACA's large AMACs correspond to the regional mine action centers (RMACs) of smaller programs.

**Upgrading**

Enhancements clearly justify upgrading to IMSMA V3.0. Afghanistan's (MACA), Lebanon's (the UN Mine Action Coordination Cell (UN-MACC)) and the United States (HDT&C and Survey Action Center in Washington) upgraded as soon as it was available with good results. The Afghanistan National Agency for Mine Action (ANAMA) customized IMSMA V2.2 to meet its needs and is now considering upgrading with help from the GICHED. Others will follow.

Training for IMSMA V3.0 was needed. SysAdmin attended GICHED-ETHZ "Train-the-Trainers" (T2T) in Genoa during April 2003. The actual upgrade is straightforward.

**Software Requirements**

ETHZ's development team recommends Windows 2000 Professional or XP Professional. IMSMA V3.0 will run on Windows NT, although this is not recommended. HDT&C installed IMSMA V3.0 on older NT machines, which worked but did not seem "happy." NT machines are now upgraded to Windows 2000. Additionally, IMSMA V2.2 must be present, so if an earlier version is installed, upgrade to 2.2 first. Microsoft Office 2000 Professional, not Office XP is required. Finally, ArcView 3.2a, the same version used by IMSMA V2.2, is used.

**Hardware Requirements**

The SQL Server backend may want a better box than the old Access database. HDT&C runs IMSMA V3.0 and MSDE on newer mid-range PCs (Windows XP Professional, Pentium 4 1.8 GHz, 256 MB RAM, 40 GB hard disk) with good results, but the database is small. UNMACA runs the full SQL Server on a Pentium 4 with 512 MB RAM and a 150-GB hard disk. Client workstations are similar to HDT&C's server: 256 MB RAM and 40-GB hard disk.

**Running the Upgrade**

First, make the usual full backups. Be aware of the following:

1. Any customization on the IMSMA V2.2 needs to be configured after upgrading. The basic procedure would be to review and update documentation for all customization—forms, reports, queries, etc.—before the upgrade process.
2. IMSMA's upgrade utility will take you to the Data Cleaning Tool. All tables in the IMSMA V2.2 database containing the "organization field need to be standardized and cleaned up because of the new IMSMA organization in IMSMA V3.0. This will be formed from old 'organization fields of the tables."
3. If you are running IMSMA V2.2 as a Server/Client solution, upgrade the server first, then client installations.
4. After upgrading, the status for all processes and status for areas must

[Diagram of the IMSMA data flow]

**IMSMA V3.0 users need only work with the Access front-end and ArcView GIS interface; high-performance back-end and database are transparent to all but SysAdmin. c/o MACA, Kabul**
be corrected by IMSMA V3.0's Data Quality Explorer tool.

HDTC and MACA found IMSMA V3.0's powerful data-cleaning tools effective in cleaning minor data-entry errors such as misspellings or different spelling of organization names. The upgrade easily-implemented names into the new context table. HDTC students can fill IMSMA V3.8 and MSDE installations on different PCs, which went well. Sometimes there would be a little "IMSMA bug"—this is nonstated against customized non-commercial software. SysAdmin should report these to the development team but not worry. Installations always ended up running fine.5

Consult with the Swiss support team if you are uncertain about upgrading. Read the manual—it's a good one!

**IMSMIA in the MAC**

**Training Issues**

Great tools are of little use without adequate training. One week of local training will work for sharp data entry people familiar with IMSMA V2.2. Managers and trainers should attend the Geneva T-Y. They should first be completely familiar with IMSMA V2.2 and ArcView, understand relational database theory and here especially SQL. The GICHD runs successful Partnership for Peace seminars in cooperation with the North Atlantic Treaty Organization (NATO) and special GIS conferences. Other training may evolve as IMSMA use accelerates.

- **A one-week "IMSMIA 101" course could cover management issues but not technical details.**

- **A second week "IMSMIA for operators" course (follow-on to "101") for advisers and Ops could cover reporting and GIS in detail without developing SysAdmin skills.**

Training within the MAC creates a progressive working environment and expedites day-to-day activities. It cannot be lazy or impatient about training lest technically oriented colleagues, and Ops must not have an attitude that they are above doing basic IMSMA tasks. IT people must not have a "knowledge is power" attitude toward sharing information. Ops should not look at IT as "geeks" who cannot understand demining. Hands-on mission-oriented training, using IMSMA reports and GIS queries to develop useful operations information, teaches valuable skills in a practical way. Cross-training where Ops and IT learn about each other's work enhances team building. U.S. Army Special Forces teams constantly cross-train. An ideal IMSMA training team might be an experienced, patient, technical person working with a similar operations person.

**Customization**

Mission action managers sometimes criticize IMSMA for not supporting actual demining—for being a "headquarters toy" to impress visitors. This may be a valid criticism but is clearly not the intention of IMSMA developers or local SysAdmin. IMSMA can give powerful support to field operators.

Perhaps something in standard IMSMA doesn't match local needs. This is why IMSMA is designed to be customized. Local teams should continually think about new development of their system. Any customization must be fully documented in accordance with good software development practices. IT should encourage non-technical feedback and do required development—but avoid unnecessary customization.

**Management Within the MAC**

In mine action programs around the world, IMSMA technical personnel are utilized for report and map printing by operations. But IMSMA is designed to be used directly by Ops for such tasks. Reporting tools are user-friendly, and basic GIS skills like producing maps and overlays are developed with practice and perhaps an ArcView tutorial. Being able to do this within "Ops," without having to wait for IT, means faster information. Misunderstandings are avoided and accuracy increases.

**Distributed IT**

To accomplish all of this, a distributed approach to IT within the MAC may prove helpful. That is, IT may give up some centralized control of information management and give greater responsibility to "Ops." IMSMA allows this to be safely done with various administrative accounts and user logs. Read-only terminals allow extraction of information, while other terminals may allow data entry but not customization. With proper training, Ops may take over certain data input activities, e.g., survey and clearance reporting. Ops may even be faster and more accurate getting this information into IMSMA's database compared to data entry people unfamiliar with the field environment. Quality control procedures may need revision in distributed IT; this may be

---

**Afghanistan's MACA manages the world's largest mine action information network, running IMSMA V3.8 and the full SQL Server backend in Kabul, with decentralized data entry at MACA's eight AMACs. c/o MACA, Kabul**
similar to requirements with decentralized data entry. MACA has accomplished much of this, with read-only terminals as well as decentralized data entry and advanced data quality capabilities.

**Conclusion**

IMSMA V.3.0 is a "mission accelerator" for mine action operations and planning; no MAC should run without it. Process management tools expedite day-to-day activities and track actual work on the ground. IMSMA connects operations staff and managers with each other and the outside world, in real time if they have strong communications. A properly used IMSMA system reduces administrative burdens.

The powerful SQL database allows fast export and import of data among mine action partners and other agencies (e.g., socio-economic or infrastructure data). GIS functionality allows map display, spatial analysis and quality control of data. IMSMA offers a wide selection of pre-formatted forms and reports and can be customized for local needs.

With IMSMA V.3.0's improved management tools, Operations can efficiently task and plan, sometimes without visiting the field. Using IMSMA this way doesn't require deep IT knowledge, just an interest and willingness to learn—and some helpful "IMSMA gods" who will share their knowledge!

**Acknowledgments**

This article was written with input from Marc Winstrom, MACA, and Shadi Hashim, UN-MACC.

This article reflects personal experiences, observations and opinions of the authors only. Nothing in this paper represents any official policy, position or plans of the authors' national governments, organizations or command structures. The principal authors alone assume responsibility for accuracy of their statements. IMSMA is a registered trademark of GCHD Geneva, Switzerland. ArcView is a registered trademark of ESRI Redlands, CA, USA. Microsoft, SQL server and MSDE are trademarks of Microsoft Corporation.

**References**

2. IMSMA (2.2.3).
4. For further information on IMSMA group and training, see the following sources:
   - *General International Centre for Humanitarian Demining (GICHD)*, IMSMA implementation and training: www.gichd.ch.
   - Swiss Federal Institute of Technology Zurich (ETHZ): IMSMA technical support, web pages: www.imsma.eth.ch/

**Contact Information**

Muhammad Quoim
Information Management Associate
UNMACA
Kabul
Afghanistan
Tel: +93 70 28 4095
E-mail: quoim@unmaca.org

John Walker
Former Training Specialist
Department of Defense HDTTC
Ft Leonard Wood, MO
USA
E-mail: jrwalker@unmaca.com
Website: www.wood.army.mil

---

Ukraine Responds to New Mine Action Demands

The Ukraine has been testing demining equipment as well as practicing new mine action methods in order to meet international guidelines. The following article discusses the different types of demining equipment that Ukrainian deminers have tested and hope to use in the future.

**Introduction**

In addressing the landmine problem in the Ukraine, we must first examine the magnitude of the problem and secondly, categorize and distribute issues into relevant categories. With more than one million mines and pieces of UXO tested in Ukrainian soil and over 11 million munitions stockpiled, most of the Ukraine's problems relate to explosive remnants of war (ERW). Twenty to twenty four domestic explosive ordnance disposal (EOD) teams travel daily to places where UXO is detected, and they neutralize on average 150 to 200 pieces of munitions. In 2001-2002, about 548,000 various explosive devices were found and destroyed. Fortunately, over the past 10 years, the international community has focused on alleviating the humanitarian impact of AP.

In the Ukraine, we are taking steps to launch our own National Mine Action Program (NMAP), and the interim infrastructure of our prospective NMAP is actively being developed. In addition to the Ministry of Defense, the Emergency Ministry and the Special Police Bomb Disposal Division, which were traditionally involved in this issue, several EOD/demining and research and development (R&D) commercial companies have been established. The personnel of these companies has been trained according to the International Mine Action Standards (IMAS) and has experience using new mine action methodologies and technologies. However, we would also like to see the international mine action community expedite the process of implementing a global EPRW program.

Ukrainian deminers in south Lebanon used detectors and probes made in the Ukraine.