CREATING AN EMERGENCY DATA EXCHANGE LANGUAGE

> *"Interoperability and compatibility are achieved through the use of such tools as common communications and data standards, digital data formats, equipment standards, and design standards. ... National standards for key systems may be required to facilitate the interoperability and compatibility of major systems across jurisdictional, geographic, and functional lines."*
> National Incident Management System (NIMS) March 1, 2004, Chapter VI

A number of public/private collaborative efforts are forging national partnership networks among federal, state, local, tribal, and non-governmental agencies, stakeholders, and systems providers to advance emergency information sharing and data exchange. One such collaboration has been the Global Justice XML Data Model (GJXDM), a large data dictionary developed by local, state and federal participants, and sponsored by the US Department of Justice. Two others are the IEEE 1512 set of transportation emergency data standards, and the National EMS Information System (NEMSIS) standard developed by EMS leaders with NHTSA support. A number of other such collaborative efforts are on-going.[1]

Similarly, a wide variety of organizations participated in the specification and adoption of the first broad-based technical standard for emergency data exchange, the XML-based "Common Alerting Protocol" (CAP) standard adopted in April 2004 by the OASIS standards development organization. The CAP standard is now being implemented in DHS, NOAA, DoJ and numerous state and local information systems. It was sponsored by the Partnership for Public Warning, the Emergency Interoperability Consortium, the ComCARE Alliance, and the Disaster Management e-Gov Initiative.

Unfortunately, each of these worthy efforts has essentially existed in its own "silo", serving the specific constituencies which sponsored the efforts, but not interoperable with the data efforts of other emergency response agencies and organizations. And most of these efforts have been focused on terms, not messaging. We need data exchange between these constituencies, so we need to bring these efforts together – at least to know what the others are doing, and at least to have the ability to exchange information. After discussions with leaders of these, we are initiating a cooperative effort to define a NIMS-compliant family of shared data exchange specifications encompassing:

- Incident Notification and Situation Reports
- Status Reporting
- Resource Requests and Dispatch
- Analytical Data; Geospatial Information
- Identification and Authentication

The Emergency Data Exchange Language (EDXL) will provide a specific data-sharing methodology to facilitate the creation of a national database of incident reports and provide a necessary application layer of data-sharing interoperability for wireless as well as wired data communications. It will be compatible with existing and planned networks and data systems at the federal, state, local and tribal levels. The first design principle for EDXL will be collaboration and transparency; the second will be adopting, promoting and spreading the work that has already been done to other professions (particularly with the very extensive GJXDM dictionary), i.e. no re-inventing of wheels; the third principle will be speed to deployment.

The Disaster Management eGov Initiative (managed by DHS' Disaster Management Program) is providing organizational resources and technical support. The involvement of all emergency practitioner groups is encouraged. The ComCARE Alliance has been tasked by DHS to facilitate these groups' participation.

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[1] This list is intended to be illustrative, not comprehensive. The authors of this paper seek involvement from all like-minded parties.

The Emergency Data Exchange Language

The Emergency Data Exchange Language (EDXL) will be consistent with the terminology and processes of the National Incident Management System as coordinated by the NIMS Integration Center. It will comprise three layers of data exchange standards utilizing XML data syntax and services:

EDXL Vocabulary – Specified data elements and taxonomies to apply common terminology to data sharing regarding emergency incidents, conditions, resources, activities and outcomes. This will draw heavily on current common-vocabulary efforts (Justice Data Dictionary, FEMA resource typing, NIMS, etc) and the XML standards cited above. This project will support emergency organizations reviewing the XML and taxonomy work product of other professions to find commonalities (the "common terms" project).

EDXL Messages – We will develop formats for messages (XML documents) using the EDXL Vocabulary to implement routing of emergency messages (a draft "header" has been produced, trialed and submitted for standards approval) and business processes such as emergency response resources reports, queries, updates, cancellations and error-handling. The current focus is on resource messages.

EDXL Interfaces – Technical protocols and formats for routing of EDXL messages over various kinds of data networks and systems, based on SOAP and web-services standards, but generalized for use in a wide variety of communications environments. Our goal is to make it simple and straightforward for vendors to write interfaces from their products to EDXL.

We propose that specifications comprising EDXL be drafted according to the needs and priorities of the emergency practitioner community (including the formal practitioner outreach process of the DM eGov Initiative), domain experts and the NIMS Integration Center, and with reference to existing foundation standards. Proposed specifications will be submitted for stakeholder and industry review and formalization through appropriate standards development bodies.

The three tiers of EDXL are linked to a fourth critical area for coordination and adoption of standards: the overall national data-sharing environment for emergency information. This broad architecture comprises both secure and open networks, preplanned as well as ad-hoc communications facilities, and a wide array of software applications and environments. Key areas for policy and coordination at this level include:

- Trust, identity/authentication, data integrity and confidentiality frameworks
- Directory and other shared "Facilitation Services"
- Service discovery and automated interface negotiation processes
- Data broadcast, wireless and wireline transmission protocols

The Disaster Management eGov Initiative is coordinating with initiatives in these areas, including the DoJ-funded "Emergency Provider Access Directory" project, the non-profit Emergency Interoperability Consortium, state and local system developers and the federal e-Authentication eGov Initiative. Broader input on these matters is similarly needed.