Gas Industry Standards Board
Future Technology Task Force

Findings on
XML Technology

REVISION SUGGESTIONS BY S. Hinton

Executive Summary

This document is presented by the Gas Industry Standards Board (GISB) Future Technology Task Force to the GISB Executive Committee in response to a request ~~directive~~ from the EBB-Internet Transition Group to investigate Extensible Markup Language (XML) technology. In a recent discussion in the EBB-Internet Transition Group, it was suggested ~~a participant had~~ ~~indicated~~ that XML holds promise as a solution for standardization in the gas industry. As a by-product of that discussion, the Future Technology Task Force was delegated the task of fact-finding on XML. We hope that the results of our efforts will yield a better understanding of XML in the following areas:

- **Definition of XML**
- **Standards development that may be underway for XML**
- **Products that support XML (~~do~~ or have plans to~~)~~ ~~support XML~~**
- **Potential applications of XML for the gas industry**
- **Stage of maturity of XML as a technology**

This paper is not intended to either promote or dissuade the use of XML, but, rather, provide a status of XML. In the course of our research, we found that XML has future potential but is still immature relative to other technologies and development tools. In our opinion ~~We concluded that~~ it would not be feasible to implement an XML industry solution by June 1, 1999. As with any technology, XML's true value and benefits to the gas industry are uncertain until business requirements are defined.

Participants in the Future Technology Task Force identified the following issues to be considered for evaluation of any new technology by the gas industry:

- Interactive access for transactional and non-transactional data
- Low entry cost for users (are packages readily available?)
- Dependencies that effect the delivery date (June 1, 1999):
  - availability of browsers
  - availability of Web server products
  - availability of knowledgeable and experienced resources (both internally or externally)
  - availability of software development kits
  - prototype/pilot test
- Requirements for standardized look and feel

- Rigor of capturing gas industry transaction elements ~~conformity for industry participants~~

- Back-end processing support
- End user data formats for downloading information
- Security and non-repudiation
- Use of the public Internet
- Coexistence/comparability with batch Internet EDM/EDI

Definition of XML

SGML (Standard Generalized Markup Language, ISO 8879) enables the delivery of self-describing data structures to applications over the Internet. HTML is a restricted subset of ~~based on~~ SGML that limits applications to data transfer and unvalidated data entry . XML (Extensible Markup Language) is also a subset of SGML. It retains the key advantages of extensibility, structure, and validation in a language that is designed to be vastly easier to learn, use, and implement than full SGML.

XML differs from HTML in three major respects:

1. XML allows information providers to define new tag and attribute names at will.
2. In XML, document structures can be nested to any level of complexity.
3. Any XML document can contain an optional description of its grammar for use by applications that need to perform structural validation.

XML is a meta-language for creating other markup languages. Unlike HTML, XML allows you define the usage of tags through the use of standardized industry (Document Type Definition) DTDs. The DTD defines the elements, their order, the relationship between elements, and processing of the elements. Because of the structural complexity that XML supports, it is considered by many proponents to be an adjunct to ~~good fit with~~ EDI.

Standards Development

XML is a subset of ISO's SGML developed by the World Wide Web Consortium (W3C) SGML on the Web working party during the latter half of 1996 and early 1997. The World Wide Web Consortium issued XML 1.0 as a W3C recommendation on February 10, 1998.

At present,~~present~~ the form-handling characteristics of XML are yet to be full agreed (agreement is expected during 1998).

Many industry groups are currently developing XML document standards specific to their industry. For example the Open Molecule Foundation is currently

developing CML (Chemical Markup Language) for chemistry and molecular data encoding.

The XML/EDI Group is ~~yet another~~ an organization with support from ANSI X12 that publishes information on XML. ~~,~~ ~~but~~ However, its charter isn't to create standards for XML, per se,. but ~~XML/EDI is attempting~~ to provide a unified structure for batch, interactive, forms-based and real-time exchanges to more fully leverage the use of electronic data interchange (EDI).

Products Supporting XML

Browsers:

- Microsoft has already shipped partial XML support in Internet Explorer 4.0, and they're likely to expand their XML functionality in a further release.
- Netscape has plans to support XML in their Communicator product by the latter half of 1998.

X12 Translators:

- Various X12 suppliers have announced plans to support XML, some as soon as the end of 1998.

Web Servers:

- Currently the various Web server vendors have plans to release versions of their products that support XML.

XML Editors:

- Various authoring tools for XML are available or under development.

Industry-Specific Products:

- *Vendors in the health-care and publishing industries currently offer proprietary XML-enabled products.*

Development Tools:

- Vendors of popular development tools have published claims of interoperability with XML, either currently, or in the future. Java is one example of such a tool.

Potential Application of XML in the Gas Industry

XML for presentation format only

In this implementation the industry ~~w~~ could define standard Web page layouts (look & feel). However, this is limiting the power of XML and has few advantages over HTML.

XML for user-defined presentation

In this implementation, the industry could standardize underlying XML data structures so that standardized presentation formats could be implemented by users on a site-specific basis to meet particular business needs. The flexibility is placed in the hands of the user to customize their XML presentations. So in theory, a service requester could develop their own forms to access multiple TSPs. ~~This would require underlying industry data structures to be standardized.~~

XML for EDI

Industry standard DTDs could be defined to use the current GISB-defined X12 standard documents. Efforts are currently underway by XML/EDI Group to define DTDs for ANSI X12 documents. XML could eliminate the need for some trading partners to have an X12 translator. To accomplish this, the service requester could use an XML form provided at the transportation service provider's (TSP) Web site which uses DTDs that map to the GISB-defined X12 standard documents for which the TSP has already developed processes. An advantage of using ANSI X12 formats is to leverage those processes already in place.

Another way to utilize DTDs would be to develop standard document formats for the industry not mapped to ANSI X12. This would allow more flexibility for the gas industry to develop standard electronic document formats specific to their needs.

Conclusions

- Although XML has future potential, it is still an immature product. Until XML standards have been refined and more products are made commercially available, the gas industry should not consider it as an alternative at this time.
- ~~**(Alternative verbiage to above A. Sicignano:)**~~
- *XML is an immature product. The base product specification has only just been approved (Version 1.0), and the specification for required formatting (XSL, and RDF) are still in draft stage. Furthermore, today's browsers lack support.*

- XML has a lot of potential and GISB should monitor the technology as it matures for applicability to future gas industry applications.

- Implementing XML would require the development of standards as well as programming. This is not a trivial task and would take a considerable amount of time by industry participants.
- **(Alternative verbiage to above by A. Sicignano:)**

- *Embracing XML would require development of new standards. Implementing XML systems would require a large programming effort (assuming XML programmers were available).*
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- Given the maturity of the technology and the effort required to develop standards and compliant systems, a June 1, 1999 implementation would not be feasible.

- When researched and complied without information on system design parameters and performance expectations, technology review, such as that presented in this report, is insufficient to base a selection ~~It would be premature to select~~ of any particular technology on which to standardize an entire industry. ~~prior to defining and developing business requirements.~~