VALUE CHAIN MARKUP LANGUAGE™ - VCML™: A COLLABORATIVE E-BUSINESS VOCABULARY

How and why should 300,000 companies worldwide leverage a 30-year, $100 billion investment in EDI?

From the earliest days of commerce, people traded hand-to-hand by verbally negotiating a fair exchange of goods and services. Over time, as the volume of trade increased and the geographical area of trade expanded, traders began to document their transactions, keeping written records of goods and services exchanged and the terms on which they were traded.

In the mid 20th century, this method of record keeping evolved into electronic documentation through the use of Electronic Data Interchange (EDI), where trading partners were [and still are] able to conduct business transactions electronically. EDI allows for automated transmission, between a company and its suppliers, of invoices, payments, and other business documents. EDI has worked well for the larger companies who can afford to use it. It can bring manual transaction costs from as high as $120 down to as low as $1.20 per transaction.

But savings brought about by EDI do come at a price. EDI requires extensive negotiation among enterprises that may have little history of co-operation. EDI requires businesses to cooperate in agreeing to vocabularies, processes, and rules of EDI messages and collectively committing to invest in the technical and organizational adjustments necessary. Every industry that has adopted EDI standards has different needs and problems. In some industries, there is an established standards organization that takes the lead. In other industries, a few highly motivated and cooperative organizations have been able to establish a foundation. In this way, EDI differs from many other information technologies in that businesses cannot implement it in isolation. They have had to learn to electronically work and trade well with others.

Method of B2B Exchanges

Source: Giga Information Group
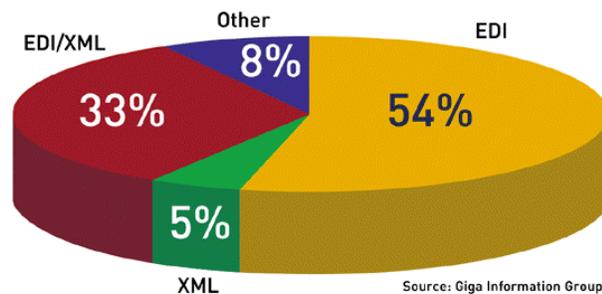
As many as 300,000 businesses in multiple industries have invested decades agreeing to and developing the EDI vocabularies, processes, and rules for trade within industries. And invest they have. Some experts estimate that as much as $100 billion has been devoted to developing the various dialects and customizations of EDI since its inception.

More recently, the advent of the Internet has brought us technologies like HTML and XML. HTML was great for presenting information over the Internet, but not rich or flexible enough for the business-to-business exchange of mission-critical documents. XML is better suited to B2B exchange over the Internet than HTML, but industry-specific and cross-industry XML standards are still under development. Businesses are not willing to wait the same 10 or 20 years for XML standards to be developed as they did with EDI standards.

So, is there a way to leverage the huge investment made in EDI...today...without having to re-engineer a solution now and then again when XML standards are finalized for intra- and cross-industry exchange?

Yes...

VCML Leverages Legacy Data

VCML - Value Chain Markup Language is the first effort to date established to deliver existing B2B documents in an XML format that retains the structure and business rules embedded within well-defined, existing documents, such as EDI. You can use VCML's standardized, dictionary-based business vocabularies to quickly and easily link existing legacy-based vocabularies to XML. You can then take advantage of the benefits of XML to electronically extend legacy systems to additional value chain partners.

Electronic commerce is continually refined, including vocabulary, processes, and guidelines established by common partners and industries, distinguishing between indirect and direct materials procurement, and furthermore, public and private sector standards of trade. With the advent of the Internet and XML (eXtensible Markup Language) technologies, companies are able to transact electronically with genuine efficiency in time, money, and accuracy. But today's industry leaders are taking the liberty to advance digital communication in a way that is somewhat antithetical to their objectives. This fast-paced evolution is creating hundreds of new and divisive XML dialects that lack a common semantic for sharing information within and across enterprises.

"Around 90% of Fortune 1000 companies have already invested in EDI" (EC/EDI Announcement," Department of Treasury Internal Revenue Services)

By creating these varied and divisive XML standards, pioneers risk building silos of information that impede interoperability among all parties in the value chain. This proliferation of disparate XML standards can create multiple models that are effective for collaboration within a particular industry using a single, established XML standard (e.g. airplane manufacturer to airplane engine supplier both using AIA EDI) but are insufficient for cross-industry collaboration (e.g. airline manufacturer to transportation provider or microprocessor manufacturer). Rather than leveraging, extending, and advancing what companies and industries have already achieved, in effect, the market is re-enacting the evolution of EDI.

The beauty of a VCML solution is in its ability to leverage the valuable components of legacy-based communication (trading partner-, business-, and industry-specific terminology, processes, and guidelines). VCML solutions then meld that mature data (nearly 30 years, in many cases) with the simple human and machine-readable format of XML.

VCML Utilizes XML Data Formats

"XML is a simple data format that balances the needs of people to read and write data with the needs of machines to read and write data."
(Dan Connolly, W3C)

XML offers users an open, extensible architecture for value chain collaboration. XML, combined with Internet-based communication protocols and security, provides universal connectivity and interoperability. XML documents can be logically structured in ways that easily express the logical structure of other common document types such as EDI, standard paper purchase orders and invoices, as well as ERP data structures. Companies are using XML to break through trade barriers and exchange mission-critical information with their value chain partners over the Internet.

When exchanging XML-based transactions over the Internet, there is a need for an agreed-to vocabulary that all parties in the transaction can easily understand. One cost-effective solution for bonding non-digitally enabled trading partners is to adopt XML as a common business vocabulary. While XML maintains the content and structure of other known document formats (like EDI), it is also extremely flexible, freeing those document formats from the constraints of rigid standards.

Furthermore, XML combines metadata (the information contained within the <brackets> that describes the data) with the actual data itself. Metadata contextually defines data so that both humans and machines are able to search, read, and understand queried data. Metadata adds valuable descriptive information to transactions and processes.

For example, consider a company that is reviewing supplier replenishment of airplane tachometers. The purchasing agent is struggling because the tachometers are described in a variety of different ways. Dealers have called the tachometer "Tachometer", "Tach", "Geschwindigkeitsmesser" (German), "chronographe" (French), and tachimetro (Italian). It is difficult to identify the tachometer in a way that all parties understand because everyone is using different XML metadata to describe the tachometer data. If you apply metadata at a fundamental level, across internal and external business processes, you will create rich semantics upon which you can build true B2B collaboration.

Transforming EDI data and metadata to XML, for example, offers a significant competitive advantage for companies by increasing the availability, visibility, and usefulness of mission-critical information across an organization. In doing so, companies now have within reach, the information needed to really understand their internal and external information assets. Furthermore, XML enables companies to extend that valuable knowledge outside the firewall to their trading partners and customers.

VCML Applies Industry-specific Knowledge

A key element of developing any representation of business information is to seek subject matter expertise. Industries around the world embody separate and unique ways of representing various types of information such as invoices, part numbers, claims numbers, or purchase orders. Developing industry-specific lists of transactions being utilized, process flows to follow, and valid values for encoded information, closely ties the markup developed to the industry implementations of that markup. As an example, if building a vocabulary for the retail industry, it would make sense to drive the XML schema representation off of retail industry standards in use today such as VICS or UCS, instead of inventing an entirely new methodology for representing that information.
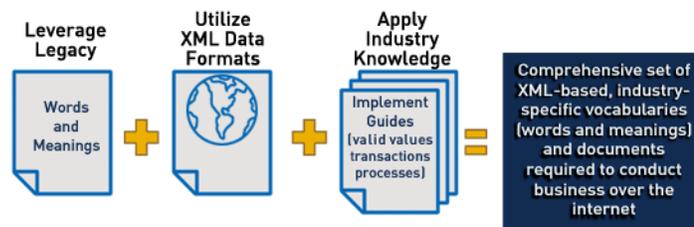
By starting the development of the markup from existing representations in other formats, VCML does not re-invent the wheel. Values, elements, and element descriptions associated with a particular industry are already a part of the VCML schemas.

## VCML Today: An Agreed-to Vocabulary for B2B Collaboration

In 1979 the American National Standards Institute chartered the Accredited Standards Committee (ASC) X12 to develop cross-industry national standards for EDI.

VCML is a set of industry-specific vocabularies, transactions, elements, and guidelines that power supply and demand chain collaboration within and across vertical industries using common syntax and agreed-to semantics. VCML allows for the integration of supply and demand chains resulting in true value chain collaboration.

VCML is based-upon a centralized library of reusable components used to build industry-specific vocabularies. Specialized, industry-specific markup language vocabularies are not separate vocabularies, but are instead subsets of the VCML superset.

VCML Vocabularies Share Common Elements
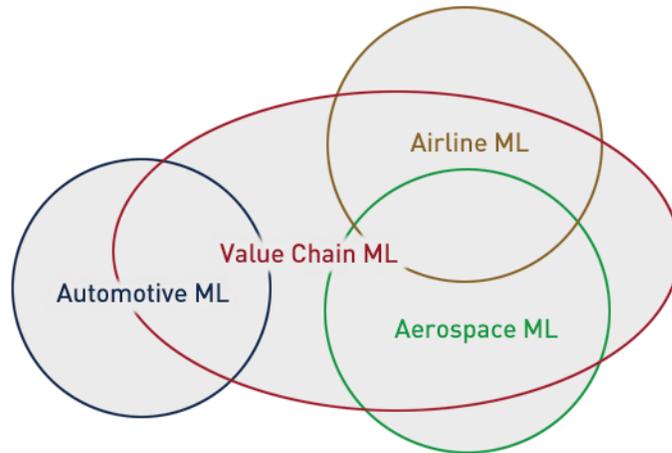
As of September 2001, VCML provides complete support for:

- Aerospace
- Automotive
- Banking & Finance
- Education
- Energy
- Government
- Healthcare
- Insurance
- Petrochemical
- Retail
- Telecommunications
- Transportation

For a list of additional industries, vocabularies, and documents supported in the VCML Library, go to www.vcml.net.

VCML USER DOCUMENTATION

The downloadable components of VCML include contains a VCML User Guide that provides information on using:

- XML Schemas
- DTDs
- Specific Data Guides
- Sample Documents
- Getting Started Guide

The user guide is provided in Adobe Acrobat PDF format. To download Acrobat Reader, go to www.adobe.com.

Applying VCML Today

TECHNICAL COMPONENTS

Adopting XML as an agreed-to business vocabulary is one cost-effective solution to integrate enterprises with their non-electronically enabled trading partners. However, when exchanging XML-based transactions over the Internet, there is a need for an agreed-to vocabulary that all parties in the transaction can easily understand.

VCML is a library of business vocabularies that takes a dictionary-based approach to value chain collaboration. The downloadable components of VCML include:

- **Schemas** - A schema for every transaction set, segment, and element in its standard vocabulary dictionaries. You can use these schemas to create transformations from one vocabulary to another.

- **Specification Guides -** Specification Guides for communicating VCML specifications to trading partners.

- **Getting Started Guide** – A summary of the possible uses for VCML and a description of the components provided in the VCML industry download packages.

Additions to the VCML package will be made later in 2001, including VCML Manager that will allow creation of new and customization of standard VCML dictionaries and sample stylesheets for displaying sample documents.

UTILIZATION SCENARIOS

VCML can be utilized by a number of technologies, as it delivers a framework for business document representation. Any-to-any mapping products, auto-translation tools, and custom-coded applications can use VCML documents as input or output for business implementations.

Any-to-Any Mapping

As with any data format, VCML documents can be used with the any-to-any mapping products on the market. If, for example, a company is interested in linking VCML documents to other XML standards or document formats by generating transformation code from an any-to-any mapping product, VCML is capable of delivering value to that equation.

Dynamic Data Translation

VCML, due to the structures produced and the methods used to produce the schemas, may be utilized within dynamic data translation products. These dynamic data translation products do not rely on hard-coded data mapping to complete their data translations, but rely on logic imbedded in the programming code and information contained in document structures to translate data from one structure to another.

Custom-Coded Applications

VCML is a metadata representation that allows you to define meaning of data or information. Each company has its own vocabulary.

Therefore, VCML can be used as input, output, or a storage format for custom-developed applications. Due to the wide range of custom-built applications within large organizations, VCML was designed to facilitate the inclusion of that application data into an XML format.

VCML Tomorrow: A Vocabulary-based Approach

The VCML vocabulary-based approach can put an end to business disconnect. It provides true vocabulary interoperability by leveraging a centralized repository of business terms that enable automated vocabulary-based mapping.

The vocabulary approach supports reuse of all common components when building new vocabularies, making translation and transformation among vocabularies interoperable and more efficient, especially if there is a wide variety of vocabularies used throughout the value chain.

VCML defines data in both human- and machine-readable terms using XML-based, content-rich metadata definitions.

The VCML vocabulary-based approach is more efficient for translation and transformation across your value chain because it uses metadata. You can use VCML's agreed-to, standardized, and vocabulary-based business terms to quickly and easily link your corporate business vocabulary to XML. You can then link that XML representation of your business documents to vocabularies that all parties involved in a transaction or a process can easily understand.

The VCML vocabulary approach utilizes a complete set of dictionaries that combine human- and machine-readable metadata into an existing document, thereby creating an XML representation of the exact document. VCML enables you to quickly and easily transform data between documents from one vocabulary to another using the metamodel of the original data. Leveraging existing semantics enables information contained in the documents to be easily repurposed when programming for translation, transformation, and real-time analysis.

All VCML vocabularies share a common XML syntax and document structure. This common syntax, coupled with the flexible semantics that leverage existing metadata, enable transformation from one vocabulary to another without losing or compromising the original document and its data content. This creates a seamless interoperability among vocabularies.

In our previous tachometer example, the VCML metadata would allow one dealer in France to call the tachometer "chronographe" and another dealer in Italy to call the tachometer "tachimetro" -- and allow both dealers to easily map transformations between the two languages and to describe the tachometer in a way that all parties in the value chain can understand. This contrasts sharply with other markup language efforts that use an English-only, data-to-data approach.
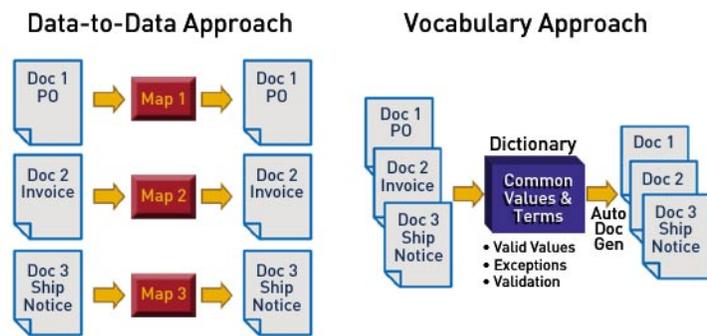
In the future, VCML and its vocabulary-based approach to data transformation will facilitate interoperable data formats. In the example of the airplane manufacturer, the interoperable vocabulary-based approach will create a many-to-many standard that will allow the manufacturer to seamlessly interact with everyone in the value chain from the transportation company to the company that provides the microprocessors that are part of the jet engine control systems.

Building a New Collaborative Vocabulary with VCML

If a required vocabulary is not currently contained in the VCML Library, contact us at support@vcml.net and we will assist you in building the required VCML dictionaries.

LEARN MORE

Stop by www.vcml.net to learn more about how VCML provides the answer to your collaborative commerce challenges.

Value Chain Markup Language

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