Do marketing students need to speak XML?

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Abstract This paper introduces and examines the need for requiring marketing majors to study the Extensible Markup Language (XML). More specifically, this paper examines the importance of XML to marketing students interested in pursuing careers in such information and data driven areas as e-commerce, direct marketing, marketing research, etc. This paper explains the basics of XML, as well as a few of the business specific derivatives, XBRL, cXML and ebXML, and concludes that marketing curricula should require that marketing students have some understanding of XML and its derivatives.

XML is a technology that is revolutionising the way in which information is shared across the World Wide Web. Andrew Warzecha, an analyst with Meta Group, predicts that by 2003 95 per cent of Fortune 2000 companies will be using some type of XML content management.¹ In a June 2000 address concerning the importance of XML, Microsoft's Bill Gates stated the following:

'XML is the base protocol for this new era. It is the thing that will be exchanged between sites, between sites and clients in order to build up these new capabilities. ... XML will transform productivity tools. For example, the spreadsheet will be changed by XML. The database will be changed by XML. The programming languages themselves will be changed. In fact, there will be language

innovation in every popular programming language around XML'.²

XML frees the Internet from one of its major impediments, the incompatibility of software all along the information supply chain. Microsoft's attention to XML is only the tip of a very large iceberg that represents the focus all software vendors are putting on XML. All major software vendors, such as Oracle, SAP and People Soft, have grasped the fundamental truth that, while they cannot own XML, the systems they sell simply will be no longer competitive because XML allows much faster, more accurate and more sophisticated communication of data.

At the current rate of progression, marketing graduates will be using XML

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in the very near future, often without realising it. The likelihood of this occurrence has major practical and pedagogic implications for all academic areas of marketing, especially areas such as direct marketing, e-commerce, business-to-business and market research. In addition to the applied impact XML will have on each of these areas, how courses in these areas are taught also will be impacted. The scope of XML's impact upon these areas, and others, provides more than ample justification as to why marketing students need to be exposed to XML and understand its basics before being awarded a business degree.

The purpose of this paper is to introduce and examine the need for requiring students majoring in marketing to study XML. More specifically, this paper will discuss the importance of XML to those marketing students interested in pursuing careers in such information and data driven areas as e-commerce, direct marketing, marketing research, etc. In lay terms, this paper explains the basics of XML, as well as a few of the business specific derivatives, XBRL, cXML and ebXML, and concludes that marketing curricula should require that marketing majors have some understanding of XML and its derivatives.

ELECTRONIC DATA INTERCHANGE

Electronic Data Interchange (EDI) has been a primary link in traditional business-to-business practice. Now, trading partners are shifting from EDI to extranets using XML because the latter is a far less costly and more flexible way to transact business. More specifically, EDI transactions flow through a Value Added Network (VAN) for which the trading partners pay service fees. The problems with EDI are twofold. In addition to being relatively expensive to operate,

EDI often lacks uniform software or communication standards. As a result, companies that trade with multiple EDI partners can be faced with the problem of being required to use different software and VANs for each partner. Moreover, the complexity of the software limits its usefulness as a means of gathering data for internal management purposes. XML provides a 'standard' approach that is customised to the industry.

HYPERTEXT MARKUP LANGUAGE

Currently, when such things as catalogues, weather or stock reports are accessed from the Internet, the information, or more accurately a presentation of the information, is transferred using the Hypertext Markup Language (HTML). When these same data are available as XML, search engines and agents can present the user with exactly what he or she is seeking. Also, since the data are tagged, rather than the presentation, XML can be custom-rendered for whatever device the user might have at the moment, whether it is a browser, cell-phone, or other data transmission device.

Today, a user can log on to a corporate website and receive an HTML presentation of the corporation's financial statement, place an order, request a quote, etc. The analyst examining that financial statement, customer checking an order, or buyer comparing specifications can mentally interpret and manipulate the information from the page of information shown on the screen. However, the computer can only see a page of characters. If the user wants the computer to perform calculations on the information, the proper numbers must be manually read from the page and re-keyed into the computer before the calculations occur.

EXTENSIBLE MARKUP LANGUAGE (XML)

While HTML currently is the most used language on the Internet for data presentation, XML is or will quickly close the gap. XML is a language designed to facilitate the creation of common information formats and share both the format and the data across the Web. With XML, data items are standardised so that they can be understood and used by programs without their knowing what software was originally used to create and format the data. In effect, each data item tells the receiving program both what it is (eg <Price>) and how much it is (eg \$100) and how it should be formatted for printing.

The XML tags data to be shared between computers in a way that allows the receiving computer to quickly, simply and accurately make use of those data. This may seem like nothing particularly new but, until XML is implemented, these qualities are achieved only through expensive EDI systems.

XML enables the sharing of data over the Internet. Since the actual data are encoded, not just presented, the data may be presented on any output device from a PC with a browser, to the cell-phone or a small personal digital assistant. Unlike HTML, the built-in validity checking of XML allows users to trust the data. Validity checking makes XML appropriate for transactions, electronic commerce, inventory management, and related activities and functions.

With XML, each item of data within the study object (eg order form) is tagged so the receiving computer can, without human intervention, accurately pick off the desired data fields. From the receiving computer's perspective, instead of getting a presentation, it has received a set of data items that can be

reformatted, used in calculations and saved as real data.

The power of XML goes well beyond handling business-to-business transactions. The real promise of XML and reason why it must receive coverage in the marketing curriculum is in its ability to facilitate access to corporate data in real-time, which can have great benefits for corporate management and interested parties outside the company. For example, a research analyst could send an intelligent agent (program) to a group of companies to pick up XML data then make accurate comparisons without the possibility of improperly mixing unrelated data items. Salespeople will be able to offer relatively small customers inventory management similar to the just-in-time systems currently available to only the largest EDI trading partners.

Relief from the necessity of having compatible and synchronised programs at both ends of the data stream provides an immense opportunity to speed information transfer. In turn, the primary benefit of XML is that data transfer can happen between completely unrelated systems and software, thus eliminating the need for tedious synchronisation of data. In addition to the agreement of the data sender and data recipient on tag definition, other requirements needed to realise these benefits and make XML work are the following:

'Before they draft a new XML language, designers must agree on three things: which tags will be allowed, how tagged elements may nest within one another, and how they should be processed. The first two — the language's vocabulary and structure — are typically codified in a Document Type Definition, or DTD. The XML standard does not compel language designers to use DTDs, but most new languages will probably have them because they make it much easier for programmers to write software that understands the markup and does intelligent things with it.

Programmers will also need a set of guidelines that describe, in human language, what the tags mean'.³

EXTENSIBLE BUSINESS REPORTING LANGUAGE

Recognising the power, importance and needs of XML for business, leading business organisations created the International XBRL Project Committee in 1999.⁴ Since its inception, the committee has been working to define a set of tags for business information. The committee has chosen to call their definitional product Extensible Business Reporting Language (XBRL), which is described as:

An open specification that uses XML-based data tags to describe information (eg financial statements) for both public and private companies. XBRL benefits all members of the information supply chain. More specifically:

- XBRL is a standards-based method with which users can prepare, publish (in a variety of formats), exchange and analyse data (eg financial statements) and the information they contain.
- Freely licensed, XBRL permits the automatic exchange and reliable extraction of information across all software formats and technologies, including the Internet.
- Ultimately, XBRL benefits all users of the information supply chain: public and private companies, the business profession, regulators, analysts, the investment community, capital markets and lenders, as well as key third parties such as software developers and data aggregators.
- XBRL does not require a company to disclose any additional information beyond that which

they normally disclose under existing business standards.

Relatedly, XBRL does not require a change to existing business standards.

- XBRL improves user access to information.
- XBRL reduces the need to enter information more than one time, thus reducing the risk of data entry error, eliminating the need to manually key information for various formats, and lowering a company's cost to prepare and distribute information, while improving user access to that information.
- XBRL leverages efficiencies of the Internet as today's primary source of information by making Web browser searches more accurate and relevant. XBRL meets the needs of today's managers and other information users by providing accurate and reliable information to help them make more informed decisions.⁵

The XBRL committee is creating a standard set of XML tags for business data that will be needed for exchanging data between software applications used by all types of organisations (eg customers, lenders, investors, auditors, etc) in accordance with existing reporting standards (GAAP). Technically called taxonomy, XBRL is basically a huge chart of accounts containing 1,100 terms, arranged in a hierarchy of up to 12 levels that reflect their logical and arithmetic relationships. The initial taxonomy focusing on financial statements was released as final on 31st July, 2000.⁶

In most cases, terms that roll up to others either do so in an additive (eg current assets roll up to assets) or subtractive sense (eg sales returns and

allowances and sales discounts roll up to net sales). The arithmetic sense assigned in the taxonomy is an important part of the taxonomy. Sometimes, the rollup is only in a logical sense (eg date of report rolls up to (is part of) the quarterly income report).

The following is a small part of the XBRL taxonomy as published by the XBRL Committee. Once XBRL becomes the industry standard for tagging business information, for any XBRL program that receives a tagged data item (eg `<cost of goods sold> 250,000 </cost of goods sold>`), the system will know exactly what it has and can make immediate use of the data in calculations or presentations. An example is as follows:

- Gross Profit** (1/monetary/add/)
 - **Net sales** (1/monetary/add/)
 - **Gross sales** (1/monetary/add/)
 - **Sales returns and allowances** (1/monetary/subtract/)
 - **Sales discounts** (1/monetary/subtract/)
 - **Cost of goods sold** (1/monetary/subtract/)

While many influential organisations are sponsoring the XBRL effort, there are other industry groups creating XML-based standards for specific needs. 'Although these standards are based on XML and may overlap when it comes to content, they address different concerns, are backed by different groups and cover different types of data'.⁷ In addition to XBRL, examples of these new or proposed languages include: Advertising XML (adXML), Banner XML (BannerML), Business Process Modelling XML (BPML), Commerce XML (cXML), Electronic Business XML (ebXML), Financial Information XML

(FixML), Financial Products XML (FpML), Financial XML (FinXML), etc. For example, cXML addresses issues specific to e-commerce, including documentation for catalogues, punchout sites (live, interactive catalogues) and purchase orders. In addition to detailed information about XML issues, the website <http://www.xml.org> provides a detailed list of industry sectors and industry-specific initiatives.^{8,9}

The World Wide Web Consortium released a recommendation in May for an XML schema. The XML schema provides a standard set of markup vocabularies making it easier for businesses to exchange data based on XML.¹⁰ An XML schema primer is available at <http://www.w3.org>.¹¹

LEARNING ABOUT XML

Most industry pundits agree that it is imperative that all areas of business begin learning (more) about XML and related derivatives. While many pedagogic methods are available for doing so, a simple way to begin is to read 'XML and the Second-Generation Web'¹² and 'The XML Files'.¹³ With that background, there also are a number of websites with helpful tutorials.¹⁴ As a precautionary note, XML neophytes should use Microsoft Explorer 5 or a later version browser, as older browsers will not work and often yield very confusing results. Furthermore, the tutorials sometimes use unfamiliar terminology and acronyms because they are written for programmers who want to become XML programmers. Mysterious words and acronyms usually can be decoded by looking them up at <http://www.whatis.com>, one of the most useful sites on the Web.¹⁵

Users may expand their knowledge about the XBRL project at <http://xbrl.org>.¹⁶ From that point, there

are literally dozens of XML related sites on the Internet that can be useful to all business students wishing to use XML or XBRL. Two lengthy manuals also are helpful, 'The XML Handbook'¹⁷ and 'XML by Example: Building E-Commerce Applications'.¹⁸ Both reference books include a CD with free XML-related software.

MARKETING CURRICULA

Most businesses on the Web have been given a power boost by incorporating XML. XML eases the flow of business transactions and makes possible real-time access to corporate data for all concerned. With the continued emergence of e-commerce, direct marketing, business-to-business marketing and so forth as integral parts of all business corporate strategy, the ability to facilitate the flow of information, better ensure its integrity and enhance the level of customer service provided represent areas of opportunity that cannot be ignored. The benefits afforded by XML and XBRL in these areas leave little doubt about the current and future role of such in the marketing curricula. Therefore, it is incumbent upon marketing educators to ensure that marketing students are equipped with some understanding of the subjects and their applications.

The general guidelines for a business degree suggest that about 50 per cent of the curriculum should be in general education, 25 per cent in the common body of business knowledge and the remaining 25 per cent in a specific area of business. This kind of breakdown raises the question of into which category many topics belong? For example, economics can be either general education or business education. Similarly, many computer-related subjects could be considered in any of the three

categories. In fact, students sometimes find themselves being taught the basics of word processing and spreadsheets in general education classes, in basic business classes, and again in advanced business classes.

The fact that new technology is being incorporated in classes in three different areas of the university attests to the importance of the subject matter to the student. While this redundancy may serve to ensure that the student understands the subjects, it also suggests that the faculty responsible for the degree may not be communicating enough about the overall content of the curriculum required for the degree.

How much XML programming does the marketing student need to know? Marketing graduates definitely need to understand about the tagging of data and related possibilities. However, do these students really need to know how to write the computer code that tags data and formats the data? The answer is probably no, unless the student plans to specialise in marketing information systems. The good news is that most new software versions typically used by marketing graduates will have inherent XML capabilities. In fact, anyone using an up-to-date version of a Web browser soon will be using XML without even noticing. For example, Microsoft's Internet Explorer 5 incorporates several XML handling features. In the near future, word processing, database and spreadsheet software will be able to recognise important words and numbers as they are being typed and will automatically associate them with XML tags. Making files available for XBRL-enabled programs will be as easy as clicking on 'Save as XML'.

Just how much of this technology a marketing graduate needs to know will depend on how tech-heavy the market and faculty require the curriculum to be.

At a minimum, marketing students need to know some of the basic terminology of XML, as they will be faced with XML no matter what their area of expertise. Minimum exposure probably can be accomplished in three or four class periods. Going beyond the basic overview will require a substantial increase in time committed, as the student will need to be conversant with HTML and a programming language like C++ or visual basic in order to actually write programs that use XML or XBRL. An optional, full semester course should be made available for marketing majors (ie those students focusing on such topics as marketing research, e-commerce, direct marketing, etc) who desire, and will require, more in-depth knowledge about the XML subject.

SUMMARY AND CONCLUSION

XML is profoundly changing the way in which information is handled on the Web. All major software suppliers are adopting XML technology as the basis for the new generations of their data handling software. Furthermore, XML will be an integral part of most business-to-business transactions in the near future. Currently, major business organisations are collaborating to create the XBRL, which will become the standard by which all business data are tagged and stored for use by XML software. In a recent speech, Microsoft CEO, Steve Ballmer stated, 'You could say we've put 100 per cent of our resources into it. We've taken an approach that incorporates XML into everything we do. I'd say we're betting the company on XML'.¹⁹

All marketing students need a basic understanding of XML, XBRL and perhaps other related XML derivatives because they will be exposed to this technology throughout their career.

Exactly how much XML should be required and where it should be positioned in the curriculum depends on the philosophy and resources of the particular college or university. The only certainty is that marketing faculty have a responsibility to ensure that students do not graduate without some exposure to XML and XBRL.

RESEARCH OPPORTUNITIES

The universal acceptance and use of XML and XBRL reveals many research opportunities in marketing. The efforts of the XBRL consortium to prepare the taxonomy (dictionary) of business needs, input and research will influence all areas of business for years into the future. While the XBRL taskforce takes pains to avoid establishing any new GAAP, the result of their efforts is going to influence business thinking and teaching for many years. The issues faced and the ultimate impact of the resulting taxonomy is rich with research opportunities.

XML and XBRL have had a profound impact on all traditional areas of business. To date, the impact of such marketing has been minimal. However, with the continued growth and acceptance of XML and XBRL, and recognising the market opportunities afforded by such, marketing academicians must respond by integrating these emerging technologies into the marketing curricula. For example, the XBRL taxonomy will create a new way of thinking about business and data transmission. New concepts and applications (eg continuously closed accounts) will need to be studied and integrated into the business curriculum as identified. The technology seemingly provides endless opportunities for the discovery of new tools, techniques and applications. The major pedagogic question to be addressed

thus becomes how best to satisfy and capitalise on this technologically driven, but market-oriented challenge, charge and opportunity.

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