

THE CONTENT EQUATION

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No matter where you sit on the content continuum, as a buyer, seller, publisher and/or consumer of content, you are affected by today's content equation: Content + Technology = Value.

Smart companies are doing the math; they've found innovative ways to provide value by pairing content and technology to deliver information in ways that make a quantifiable and valuable difference in people's lives. Knowledge for the sake of knowledge and technology for the sake of technology don't solve the equation anymore. Content + technology, or content wrapped in technology, is what powers useful solutions. Solutions individuals and institutions will pay to use or be inspired to use because of the efficiencies gained in production, development and/or workflow. For the purposes of this article, content means text, data or images, and technology means XML and related systems. The value piece comes from the combination of these two elements to provide information and metadata about that information to individuals, institutions and systems.

Where does XML fit into the equation? XML and XSL are the key technology variables in the content + technology equation. XML adds intelligence to the content; XSL/XSLT multiplies the value of the content by enabling output to numerous media, such as Web, print and mobile devices. The technology has finally come to the point where we

can integrate XML-based applications into numerous workflows, products and data exchanges so as to be able to clearly demonstrate time savings and quicker return on investment – two of the missing variables needed to take the industry into the next generation.

In 2003, we saw a growing adoption of XML across all industries. Publishing, real estate, travel, health care, finance, government, you name it. Players in each sector embarked on ways to adopt XML standards and technologies to enhance information search, retrieval, exchange, storage, editing, publishing, management, use and reuse.

Why XML?

XML is now the open standard used to describe content and is accepted by virtually all content consumers and users.

Those who aren't yet using XML are indeed aware that the time has come for conversion. Early adopters of SGML, the precursor to XML, are now in the process of updating to XML. Most people understand that XML statements define what content is. The beauty of using XML is that it can be readable by mere humans as well as complex data systems. Another beauty is that XML can nest elements within a document to address complex relationships such as a purchase order that includes shipping and billing addresses and quantities.

In addition to changing the world of

document-based content, XML adoption is changing how data fit into the equation. Enterprises acknowledge the need to deal with the issues of taking proprietary metadata out of databases and turning them into XML. Data have been locked in proprietary and nonstandard systems for too many years. With the advent of XML/XSL, now there are standard methods for integrating and sharing data. As a data syntax standard, XML enables cross-platform distribution of purchase-orders, invoices, insurance forms and a host of other business documents across applications. Useful XML-based database applications are providing value across industries. A growing number of computerized library systems; claim processing; and hotel, travel and flight reservations systems leverage XML, all of which make life easier for people and institutions.

In recent months we've seen the next phase of XML adoption begin: the tools used every day in a typical office, such as Microsoft Word or Excel, are starting to support XML in useful ways. For example, Microsoft's newest version of Office includes an XML forms capability, so an office worker can create a "new employee" form, store it in an XML format and publish that form to a central location where the new employee can complete and submit it. Business managers, not CTOs, can import XML data into Excel to produce profit and loss statements,



In the content equation, where “x” equals “XML,” companies are discovering that content + technology = value. This equation has already spawned the next evolution of the Internet.

departmental budgets or timesheets. These seamless integrations are accelerating the general acceptance of XML among broader audiences. That is because these XML-based applications and capabilities empower the user, and empowerment = value.

Other Technologies

Fortunately, with XML becoming a basic design reality when writing applications, new tools and technologies based on the XML standard are proliferating.

SVG: One of the most exciting XML-based technologies that unleash valuable applications is SVG. Short for scalable vector graphics, SVG is an XML-based vector graphics file format that enables two-dimensional images to be displayed on the Web. In other words, it provides a visual representation of XML data. The technology allows for zoomable graphics and images, multimedia and rich graphics, and custom interactive events and animation. For example, a publisher that compiles, edits and produces election data can now overlay that information onto a graphic image of a map so the maps can be color-coded to show campaign coverage or penetration of political parties. Or, ticket sellers can enable customers to view and choose their seats in a theater or stadium, then place the ticket order. Some airlines are already providing this functionality for choosing and

booking airplane seats. SVG still has some wrinkles to be ironed out before it can become as widely adopted as other graphic standards such as JPEG. One of the drawbacks at the moment is that no browser fully supports SVG. As a consequence, SVG has to be displayed through the use of a plug-in such as the Adobe SVG plug-in.

RFID: This XML-based technology integrates data generated by radio-frequency identification (RFID) technology with data from other sources. The technology could eclipse the ubiquitous barcode. RFID allows for automated tracking of inventories. Tiny electronic tags are stored in items from dog collars, to plants, to sneakers. A company that manufactures widgets or goods anywhere in the world might use the technology to track shipments en route to the company's various manufacturing facilities. This helps lower costs, improve internal operations and even increase potential sales. Consider for example that Walmart Stores Inc. has made RFID compliance a mandate for its top suppliers.

Web services: Continuing to gain momentum in the content world is interest in Web services, a suite of XML technologies that helps fuel and even redesign the e-commerce model behind business-to-business and business-to-consumer transactions by allowing organizations to communicate data without transferring intimate

knowledge of each other's IT systems behind the firewall. The term Web services actually describes a semi-standardized way of integrating Web-based applications using XML, along with the simple object access protocol (SOAP), Web services description language (WSDL) and universal description, discovery and integration (UDDI) open standards over the Internet. XML is used to tag the data; SOAP is used to transfer the data; WSDL is used for describing the services available; and UDDI is used for listing what services are available. Assuming the big players in the space can get along and standards can be agreed upon, distributed computing will change significantly by allowing computer systems to freely exchange data independent of their language, architecture or platform. E-commerce applications might be available on a per-use basis as service-based computing expands the Internet into the next phase.

Show Me the Value

Widening acceptance of XML and the growing number of practical, time-saving, cost-cutting XML-based applications have also translated into true reusability of content. Segmenting content means increased granularity of data and content can be output to print, Web sites, PDAs, cell phones and virtually any future output devices. For example, a medical refer-

ence book in XML can be searched on a Web site or accessed through a physician's mobile device. A pharmacologist interested in a drug monograph might prefer to retrieve drug monograph content for just side effects of a selected drug as opposed to viewing the drug monograph in its entirety. The physician or pharmacist in these cases perceives tremendous value in receiving the right content at the right time.

A recent study by market-research firm Datamonitor predicts U.S. banks will upgrade and renovate 30,000, or 26 percent, of their branches by 2006 and spend \$1.4 billion on branch technology in 2006, up from \$800 million last year. Most of this spending will go toward

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enabling branch personnel to view all of a customer's relationships with a bank, connecting the bank's multiple service channels and boosting customer self-service capabilities. This workflow relies on XML. In fact, examples of XML-based workflows abound, and the value is obvious to people at all levels in the organization.

A database of molecular information in an XML-based repository makes it possible for a researcher to quickly access, search and retrieve information about a specific chemical compound. In the past it may have taken several hours to find this information; now it can be done in minutes. This researcher can get home in time for her son's baseball game now, a significant time savings indeed.

Low-fare airlines are building better online-information tools to capture more share of the ever-competitive business-travel market. Using the success of Southwest Airlines' *swabiz.com* online corporate-booking tool as a model, other airlines including America West Airlines and JetBlue Airways are launching

online corporate booking sites. If you are the office manager responsible for booking travel for the upcoming company sales meeting, surely you'd prefer to make reservations for all 500 attendees online rather than trade phone calls and voicemail with booking agents. This is the kind of convenience people have shown they will pay for.

Consider that doctor who can enter patient information into her wireless device as she is seeing a patient. If that patient has a question about side effects of a specific drug, the physician has the side effects at her fingertips. Easy-to use data analysis software used in conjunction with XML databases allows that same physician to more effectively

examine possible outcomes or treatment scenarios. Everyone wins in this model. The patient doesn't have to wait and gets answers at the point of care. The doctor saves time and does an even better job.

Convergence of XML and Data

Another recent trend in the content equation includes the convergence of XML and data. Conducting a thorough content analysis can often reveal new ways of looking at and organizing data. For example, sometimes content shared across products might be better suited to a relational database structure (data tables), whereas product-specific content could still be structured in XML files stored in the database or a separate repository. The two content types can still come together through references from specific database fields to the XML files or vice versa.

Consider the structuring of pharmacologic content. Some common elements in drug information for medical specialists are:

- Generic drug name
- Trade name
- Indications
- FDA drug status
- Pregnancy category

This content lends itself to a relational model because the value for each field requires little or no narrative, which often requires XML markup.

However, other fields are longer and might comprise multiple paragraphs, lists or other narrative elements. For example:

- The full monograph
- Nursing indications
- Pediatric concerns
- Indications for use in veterinary medicine

This content could be structured in XML and related back to the database fields. One drug name could point to many XML files as well as one XML file could point to many instances of a database field. Already it's evident how content re-use comes into play in this scenario.

Where do we go from here? Relatively immature XML-based technologies, such as SVG and RFID, will evolve; wrinkles will get ironed out. Existing technologies will be perfected, with business requirements demanding certain features and functionality. New technologies and applications will emerge. Every sector of the information industry will be affected and encouraged to differentiate products through XML-based technologies and tools. The industry as a whole will look to create more applications using XML as a way to create value for individuals, institutions and customers. Less and less content will be locked up in proprietary formats. Standards will continue to evolve to allow for the exchange of data across disparate systems. Content + Technology = Value. But it's more than that. This equation, and how companies apply it, has already spawned the next evolution of the Internet.

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