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Turn SPL into a Business Advantage …

Three Pitfalls to Avoid on the Road to Successful Compliance

For many pharmaceutical companies, the task of managing product information is about to become even more complicated. The decision by the Food and Drug Administration (FDA) to mandate Structured Product Labeling will add another layer of complexity to a process that already requires pharmaceutical companies to shepherd huge volumes of content through multiple internal and external checkpoints.

The FDA plans to complete the regulations, standards, and systems needed to switch labeling content from PDF to SPL, an XML output schema, for prescription drugs by Fall 2005 and for all FDA-regulated products by 2007. Converting product-labeling documents to an XML output format like SPL represents a major challenge. But savvy pharmaceutical companies are viewing the SPL requirement as an opportunity to increase productivity and efficiency, not just as another regulatory burden.

Faced with increasing requirements to put more information on packages and share it with pharmacists and doctors, these companies recognize that deploying XML-based content management systems will enable them to automate and streamline the business processes required to create, manage and distribute all labeling-related content.

As companies move to comply with the SPL mandate, they also need to be wary of several potential pitfalls, especially if they decide to deploy new content management systems. These pitfalls typically occur in one of three areas:

- inefficient business processes
- organizational boundaries
- technological limitations

These problems are often compounded when organizations enhance existing legacy systems to support minimal SPL compliance without analyzing their entire content supply chain – the sequence of activities required to create, manage and distribute content.

Organizations that adopt a careful, strategic approach to SPL compliance, one that embraces XML and its potential and takes precautions to avoid these pitfalls will clearly seize a clear competitive advantage and drive significant enterprise-wide improvements.

With that goal in mind, this white paper will:

- explore the implications of SPL for pharmaceutical companies
- offer advice on how best to approach compliance with SPL
- share tips on how to avoid common content supply chain traps
- provide examples of how companies are improving business processes that support product labeling

The Challenges of Managing Product Information

Few external documents are as critical to a pharmaceutical company as product labels. Closely regulated by the FDA and other national regulatory agencies, these documents deliver critical information to doctors, pharmacists and patients on drug interactions as well as instructions on how to take the medicine. And they go far beyond product inserts. Labeling documents often contain up to thousands of printed pages detailing the drug's chemical composition, the medical conditions it addresses and the potential side effects or contra-indications.

Managing product information has become far more complex both inside pharmaceutical companies and outside in the health care system they serve. In today's global health care companies, numerous departments across the organization create and use product information for distinctly different purposes. New research and new uses for drugs often bring changes in labeling. For many companies, far-flung global operations make it difficult to coordinate all of the activities that affect labeling, despite ubiquitous information technology.

The complexity only increases when product information finds its way to the FDA, onto labels and Web sites, and into promotional literature. Many constituencies – physicians, pharmacists, researchers, regulators, and patients – access the information through a variety of channels and depend upon it to guide them in making critical decisions. Although accurate and consistent product information is as vital as the drug itself, today's cumbersome systems for handling such information make it increasingly difficult to serve all channels consistently. In fact, the system for gathering product label information and disseminating it to pharmacists, doctors, and the public has grown more complex and susceptible to error.

All of these factors greatly multiply the potential for errors, inconsistencies, and liability. For example, a drug that is produced in multiple formulations requires separate packaging and labeling information for each formulation. Should labeling for one formulation mistakenly turn up in a different one, the pharmaceutical company could face a variety of adverse consequences, including an FDA recall. Similarly, if a company updates a labeling change in the package insert but not on its Web site, a physician or a patient could inadvertently make important decisions on the basis of faulty or incomplete information.

The Promise of SPL

In 1999, the FDA began allowing the electronic submission of product labeling information in Portable Document Format (PDF) files, which enabled the agency to process, review, and archive labeling content electronically. In response to the recommendations of the Institute of Medicine and the National Committee on Vital and Health Statistics and mandates in the Medicare Modernization Act of 2003, the FDA created a new role for electronic labeling information – to support health information management technologies such as electronic prescribing and the electronic health record (EHR).

When the FDA determined that using PDF documents would no longer adequately support those initiatives, the agency published the final electronic labeling rule in late 2003 that required the submission of the content of labeling in electronic format for drug and biologic marketing applications. Working with interested parties in Health Level Seven (HL7), a standards development organization, the agency adopted a proposed standard called Structured Product Labeling (SPL) for describing the content of prescription drug labeling in an XML (eXtensible markup language) document.

An SPL document consists of an XML document that contains the text and images in an approved prescription package insert (e.g., the content of labeling) along with additional information for machine processing of label content (e.g., header information and data elements). A set of files collectively referred to as a stylesheet converts the SPL file to a human-readable format. The stylesheet then displays the information in the XML file in a consistent format for viewing.

SPL offers numerous advantages over files stored in the PDF format, enabling, for example:

- the automated exchange of information among disparate IT platforms, applications and interfaces
- a more efficient exchange of updates to labeling content
- the comparison of text and specific data elements
- the exchange of information needed for other submissions, such as drug listings, thus eliminating redundant data collection and improving efficiency
- reuse of common components of content between labels and other relevant documents (e.g., promotional literature, packaging, Web site content, package inserts for different formulations, submissions to regulatory bodies outside the U.S.)
- the rendering of labeling content into multiple output formats (e.g., PDF, HTML) from the same XML source file

Advantages of XML

Originally designed to meet the challenges of large-scale electronic publishing, XML has emerged as an increasingly important means for exchanging a wide variety of data over the Web and elsewhere. XML is a simple, application-neutral mark-up language designed to provide information within a structured format and with semantic knowledge. One of its primary benefits is its ability to store any kind of structured document that can be shared between different platforms. Most important, it also preserves the narrative structure of SPL documents so they can be published in standard presentation outputs like PDF and HTML that can be read by both humans and machines.

XML supports the reuse of the same information in a variety of documents and channels. Pharmaceutical companies can store product information in a single location and source format, thus ensuring that product information remains consistent whether the output is a package insert, packaging, a Web site, marketing material, or a submission to the FDA. For example, a change in product indications made in one section would automatically be noted by other areas, requiring them to review that information and ensure that all appropriate outputs are updated.

Moreover, XML's uniform formatting and the centralizing of content control it affords, enables companies to search all of their product information more efficiently and use it more effectively in all contexts.

The Benefits of an XML-Based Product Information System

XML has the potential not only to speed up the FDA's review of initial labeling and post-approval labeling changes, but also to help the agency communicate accurate information easily and rapidly to physicians, pharmacists, and patients. Ultimately, the FDA intends to create a single-source, streamlined flow of consistent and accurate product information from the manufacturer to end users such as health care professionals and members of the public.

Once pharmaceutical companies submit their labeling content to the FDA, the information will automatically go to the National Library of Medicine (NLM) and be stored in the DailyMed database. The NLM will publish this labeling content in various formats, making it accessible to health care professionals, the public, and various regulatory and corporate computer systems. In addition, the new format will enable the FDA to consider single labeling changes, which makes it unnecessary for a pharmaceutical company to re-submit the entire product information document.

One of the major benefits of XML is its ability to support single-source publishing systems, which create multiple outputs from one source document. Single-source publishing delivers a number of major benefits, including:

- making timely and accurate labeling information readily available to key constituencies
- improving and enhancing the review, storage, and distribution of labeling content
- ensuring that people and machines can read and process labeling content more efficiently
- reducing the costs of generating product information
- decreasing the risk of liability as a result of inconsistent product information

SPL Compliance… a stepping stone to a Streamlined Content Supply Chain

According to the FDA's guidance, the SPL standard will apply only to the content of labeling provided with original submissions, supplements, and annual reports for human drug and biologic products. This includes new drug applications, abbreviated new drug applications and most biological license applications.

At a minimum, complying with the SPL initiative will require pharmaceutical companies to:

- convert the content of all new and current labeling content to an XML format
- submit the narrative content of the labeling and the structured data for the drug listing
- ensure that product information remains consistent and accurate across all relevant channels

Pharmaceutical companies have several options as they gear up for these tasks. Before moving forward, however, many companies need to consider whether they wish merely to comply with the SPL initiative or take the opportunity to assess the entire business process required to create content for their labeling and documentation systems.

Companies that simply convert documents to XML and then return to business as usual will not gain any benefits from the conversion. In fact, they will largely be managing information in the same manner as before SPL, only now with another step in the labeling process. Instead of increasing efficiency, such an approach requires even more time, manpower, and money – a tremendous waste of resources in an industry where speed to market is critical.

In addition, SPL is only one piece of the entire submissions process that includes labeling and package inserts. The process requires companies to submit millions of pages of documents – from clinical trial results to possible contra-indications – that need be managed and compiled into an integrated set of documents. XML has the potential to add tremendous efficiencies to the entire content supply chain, which could reach far beyond the labeling process.

Companies that decide to overhaul their entire content supply chain, however, need to adopt a measured, comprehensive approach to ensure that the entire company is ready to exploit and leverage XML throughout the organization. This approach doesn't always require a massive transformation at the outset. Rather, a company can embark on the process by taking relatively small, carefully planned steps that enable it to assess various needs, identify opportunities, and convert those opportunities to operational and competitive advantages.

Six Steps to SPL Compliance

Step 1: Analyze current processes and technologies for producing labeling documents

- Start with a thorough analysis of your business processes to identify inefficiencies and redundancies. In many companies, different departments like regulatory affairs, labeling and design and sales and marketing may use different operating platforms, such as FrameMaker, Powerpoint or Quark. These platforms may not communicate effectively with each other and sometimes require significant duplication of effort, which ultimately leads to higher costs and longer turnaround times for generating information.
- Develop and cultivate a vision for how your organization will utilize standards-based technologies and streamlined content creation processes. This will give you a strong sense of where you want to go as an organization and help you measure the long-term success of the new system.

Step 2: Identify business and technology requirements for the long-term vision

- Based on the results of this analysis, address your short-term and long-term needs for labeling and related content. In many situations, you will need to consider the systems you use for content authoring, collaborative review, content management, automated workflow, remote collaboration and approval, and publishing to multiple output formats.
- Once you've defined your requirements, evaluate the available technology options that will meet those requirements. This is where an outside expert with broad expertise in content management systems could help you make those evaluations and weigh the benefits of potential solutions.

Step 3: Devise a phased implementation strategy

- Start small. Deploying major new business processes and technology platforms all at once often carries high risk of failure, and also extends the time required to recoup your investment. A much more successful approach is to identify a representative subset of your labeling content and stage it in a test with your preferred technology solution. This will cost less money, enable you to recover your investment faster, and also allow you to smooth out the kinks of an implementation before unveiling the new system to the entire user community.
- While this may sound time consuming, this evaluation can often be done in six to eight weeks once the appropriate solution has been identified. Moreover, it will also set the stage for the broader deployment down the road.

Step 4: Decide on data conversion strategy

- Before you deploy your new system, ask yourself what shape your current content is in. Are there multiple file formats? Have content creators strictly adhered to style and template requirements, or are there major inconsistencies? Depending on the answers to these questions, it might be more cost-effective to utilize third-party conversion vendors than to use automated conversion tools and require your own staff to do data cleanup. This also depends on the amount of legacy files that will need to be converted.
- In this environment, some organizations may opt for a hybrid approach, outsourcing legacy and current documents, while at the same time deploying a more comprehensive content management system for the future.

Step 5: Deploy new labeling environment

- Once your pilot environment is production-worthy and your data converted to SPL-compliant XML, develop a controlled rollout strategy to migrate all content into the new labeling content management publishing environment. Start with drugs or new product offerings and then move into other labeling systems that are slated to be rolled out in 2006.

Step 6: Assess future needs

- An effective content management system should be dynamic and flexible enough to adapt to emerging needs or new requirements. Once you begin labeling production, continue to monitor and solicit feedback from all stakeholders, then determine how to adjust and improve the environment. In addition, you should continue to look at other initiatives, such as eCTD and eSubmissions, and determine the best strategy to leverage your new labeling technology architecture.

But avoid these common pitfalls

While evaluating content supply chains for our clients, we've recognized consistent patterns or recurring issues – areas that can hinder the ability of companies to achieve a significant payback. Companies that address these potential pitfalls before and during the process of becoming SPL-compliant will be in a much stronger position than companies that charge blindly ahead.

Inefficient processes…

- *Using highly skilled people on manually intensive tasks*. To achieve maximum efficiency, you should ensure that your new XML system will enable you to utilize your highly skilled staff and subject matter experts in the areas where they are most adept. For example, an effective SPL authoring/editing tool should not require writers and editors to spend inordinate amounts of time troubleshooting document formatting problems.
- *Automating existing processes with little change.* A careful analysis of your business processes will usually uncover a host of redundant tasks and other inefficiencies. This gives you an opportunity to streamline and optimize your business processes. Moreover, it will also demonstrate the value of the new system to your user community and increase the chances for a successful implementation.

Organizational boundaries…

- *Make sure that departments do not duplicate effort across departments.* Using an XML-based content management system enables departments to share content in ways that were not possible before. For example, there may be overlapping content development between labeling preparers and scientists in Research and Development. Other groups that need to work with similar information are Marketing, which needs current information when creating sell sheets, and Packaging, which then distills this key information from Instructions for Use to meet packaging requirements. If these departments are recreating the same content to generate their deliverables, the organization is not achieving the full potential cost savings of XML.

Technology limitations...

- *Don't get bogged down by proprietary systems* that make it difficult to migrate legacy content, metadata, links, and automated workflows into a new system.
- *Beware of standards-based systems that actually manage content in proprietary ways.* A corollary to the above pitfall, make sure you investigate how a content management system manages linking relationships and reuse between content components. Many systems that purport to be XML-compliant actually use proprietary function calls and API extensions to XML that constrain the environment and create a closed architecture. This essentially ties you to one vendor and may make it extremely difficult to migrate to other systems in the future.
- *Don't use tools for something they weren't designed for*, such as using MS-Word for final composition.
- *Avoid patchwork integration of systems*. One of the key benefits of the SPL initiative is the ability to use XML as a foundation for working across different platforms. But you need to follow through and leverage XML's inherent advantage as a standards-based approach to ensure that you communicate information between the disparate systems.

Separately, each of these traps can severely impair an organization's efforts to build an efficient content supply chain. Collectively, they make it all but impossible. But if pharmaceutical companies fail to address them, they will be missing many of the benefits that come with converting their documents to SPL.

Business Benefits of Content Supply Chain Excellence

While pharmaceutical companies are just beginning to embrace XML, other industries have adopted XML-based publishing systems, achieving significant benefits in the process, including:

- reduced cost of operations and increased profitability
- increased business agility and competitiveness
- improved productivity and output
- accelerated turnaround times and speed to market
- superior content quality and utility
- broader exposure to innovation and best practices

One global IT company – which delivers products to consumers in 170 countries – deployed an XML-based content management system to streamline the process required to customize product documentation in 35 languages. They created a single document and stylesheet that supported the reuse of content, significantly improving time to market, lowering costs and enhancing flexibility.

A publisher of glove-box manuals for U.S. automotive manufacturers built an XML publishing environment that allows them to standardize and reuse content for print and on-line publishing formats. The new system allows writers at different locations to create and update information elements. For example, the instructions on changing a tire are common for every location, while others, such as safety restriction information may vary depending on each country's specific regulatory requirements. In addition to reducing publishing costs, the new system has cut four to five weeks from the time required to print glove box manuals in foreign languages such as Arabic.

Case Study #1

Challenge: A leading pharmaceutical manufacturer needed to build a more efficient system for generating product labels, particularly to meet the requirements for both the FDA and its European equivalent, the European Agency for the Evaluation of Medicinal Products (EMEA). A key criterion for the company was to reuse content for both agencies, while reserving the capability to customize other sections to meet unique local requirements. For example, the content that details interactions with other drugs is often similar but needs to be translated or customized to meet different formatting requirements.

Solution: Even though SPL had yet to be mandated, the company decided to create its core data sheets in XML because it knew that this would give it the flexibility to create documents that would meet the labeling requirements for both agencies. As they designed the system, the project team created document transformations that merged the different formats into a template that set the stage for the next step in the authoring workflow, enabling authors to use the core data sheet as the source for converting the documents into the necessary labeling formats.

Results: The XML solution dramatically cut the time and costs from the process required to submit documents. In addition, the core data sheets delivered specific elements of content to the final documents to be distributed to key audiences. Even more important, the company seized a competitive advantage by converting labeling documents to XML well before the deadline set by the FDA.

Case Study #2: Fortune 500 Medical Device Manufacturer

Challenge: The Technical Services division of a clinical diagnostics company realized that it needed to upgrade its current production environment to meet regulatory compliance issues such as the European IVDD initiative. In addition, the company also wanted to improve the way it was sharing and re-using information across product sets and delivery types, as well as enhance version control. Moreover, the company wanted to find a way to improve the delivery of localized information products – which was time-consuming, expensive, and prone to error – and automate manual processes that were burdening a finite staff with an ever increasing workload.

Solution: The company launched an initiative to develop a single-source publishing environment for the creation and delivery of information products to global markets. The information product set would include user and service manuals, wall charts, and packaging instructions. The company also embraced a phased approach, in which they first developed a "Proof of Concept" (POC) prototype environment to demonstrate how a migration to an XML-based single-source authoring/publishing environment would progress. This prototype demonstrated that XML content could be published to PDF, HTML, and RTF (MS-Word) formats in several languages. The company next moved into a production pilot in which they implemented a production-quality content management/workflow environment with the XML content from the prototype.

Benefits: The implementation is still in the early stages, but the company is already seeing significant benefits in terms of faster workflows and reduced duplication of effort.

Conclusion

SPL is fast approaching as the new standard for the pharmaceutical industry. But companies also have to remember that it's just another step in an ongoing series of FDA initiatives, starting with eCTD, to encourage pharmaceuticals to embrace XML as an industry-wide standard. That's why it is imperative for pharmaceutical companies to develop a strategy that looks beyond the immediate requirement of simply converting their labeling document creation process to XML. By proactively embracing the SPL mandate as an opportunity to examine and streamline the process to generate labeling information, pharmaceutical companies can turn this regulatory requirement into a business advantage.

We've found that organizations that optimize their content supply chain typically find new ways to transform inefficient business processes, flatten organizational boundaries and overcome technological limitations that inhibit the flow of information. Once they improve that flow, the door is often open to an even wider range of benefits – from lower costs to greater operating efficiencies.

Aligning and optimizing all labeling content-related processes, systems and specialized talent within your organization will enable you to achieve results that reach far beyond your content supply chain. In essence, you'll be taking a huge step forward to creating a more efficient and effective organization.