OXYLEME

**Reusability 2.0:
The Key to Publishing Learning**

A Chapman Alliance White Paper

by Bryan Chapman, Chief Learning Strategist
Sponsored by: Xyleme, Inc.

Abstract

What would you do if you had to develop and deliver personalized training to 900,000 employees, located in 34,000 different locations globally with a complex set of variables that changes training on a location-by-location basis? The key is reusability 2.0. While technology-delivered training has become main stream in many organizations, most are still not fully leveraging the power of reusable learning content to meet their instructional needs. One of the main reasons is that most learning technologies are designed to create content for a specific learning purpose (i.e. e-learning). But, how can content be reused to support many learning purposes and embrace several modes of delivery; and most importantly support the right learning, at the right time – on demand? This research report examines, case studies of three organizations that employ reusability 2.0 techniques to meet sophisticated learning and business requirements, while delivering on-demand content for use in customized instructor-led training (ILT) support material, student manuals, lesson plans, textbooks, job aides, performance support, certification exams, and online learning etc. – all through a single production pass to assemble and organize reusable learning content.

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Introduction

Reuse of learning content has had a major impact on organizations that have been transformed from a "training" to a "learning" environment and the way they leverage learning technologies to align with business and educational needs. It wasn't always that way. In the early days of computer-based training (CBT), courses were crafted as large, monolithic structures, several hours in length. Learners traversed a designated path though learning events, in the exact sequence prescribed by a course designer. This worked well for specific, high-profile learning initiatives, delivered via one medium, and designed to reach very large target audiences; but was also extremely cost prohibitive for most, required lengthy development cycles, and caused an unmanageable quagmire when it came to updating training.

Around the beginning of the year 2000, commercial learning content management systems (LCMS) introduced the concept of "learning objects" and the ability to reuse content across multiple courses. We learned how to create smaller, bite-sized modules as a team as opposed to working individually to author courses. The most important lesson we learned from early reusability attempts (reusability 1.0) was that modularization of learning content enables us to create derivative versions of courses for different audiences and even to reuse digital media assets (such as graphics, video and animations) in other courses. For the most part, the technology works well to streamline development and to update content, however, most of these lessons have been applied only to the production of singular or limited delivery formats such as e-learning and performance support, ignoring the fact that classroom, print-based, and face-to-face interaction are still the most pervasive forms of learning we use today, and will remain in place as long as there are people involved in the learning process.

So, the problem is it this; how do we get our arms around the bigger picture and fully embrace all formats of learning delivery, across the board? How do we (1) decrease the cost of leaning development, (2) reduce lengthy development cycles and (3) create an environment where content changes are made instantaneously, across all learning delivery formats?

The answer is reusability 2.0.

Reusability 2.0 Defined

Reusability 2.0 doesn't detract from any of the benefits of current reusability practices. Rather, it adds further dimension and reach to what's possible in supporting all methods of learning delivery across the entire organization. Consider the following definition:

> Reusability 2.0 is method of creating, organizing, storing, versioning and publishing reusable learning content in a common, central repository for the purpose of creating learning support, regardless of delivery format (i.e. instructor guides, lesson plans, classroom visuals, tests, handouts, online courses, job aides, etc.).

Another way to look at reusability 2.0 is to compare and contrast it with other modes of learning development. Figure 1.0 classifies production methods used to create a wide array of many different formats of instructional delivery. Each numbered zone on the chart represents an approach to production.

For example, in zone 1, a development team creates content for a specific learning purpose, using traditional authoring or other content development tools. Again, this was the technique used to create full CBT course in early days and is still frequently used by many organizations, even as courses become more modular by design.

Zone 2 illustrates the methodology used by most organizations today, namely, to use multiple tools, each designed for its specific purpose to create learning content, such as using Microsoft Word to create a lesson plan, PowerPoint to create class visuals, and authoring tools to create online courses.

In zone 3, the development groups leverage the principles of modular content, team development and reusing content for specific or limited-use delivery formats. LCMS technology is one of the main methods to support content reuse for specific learning purposes.
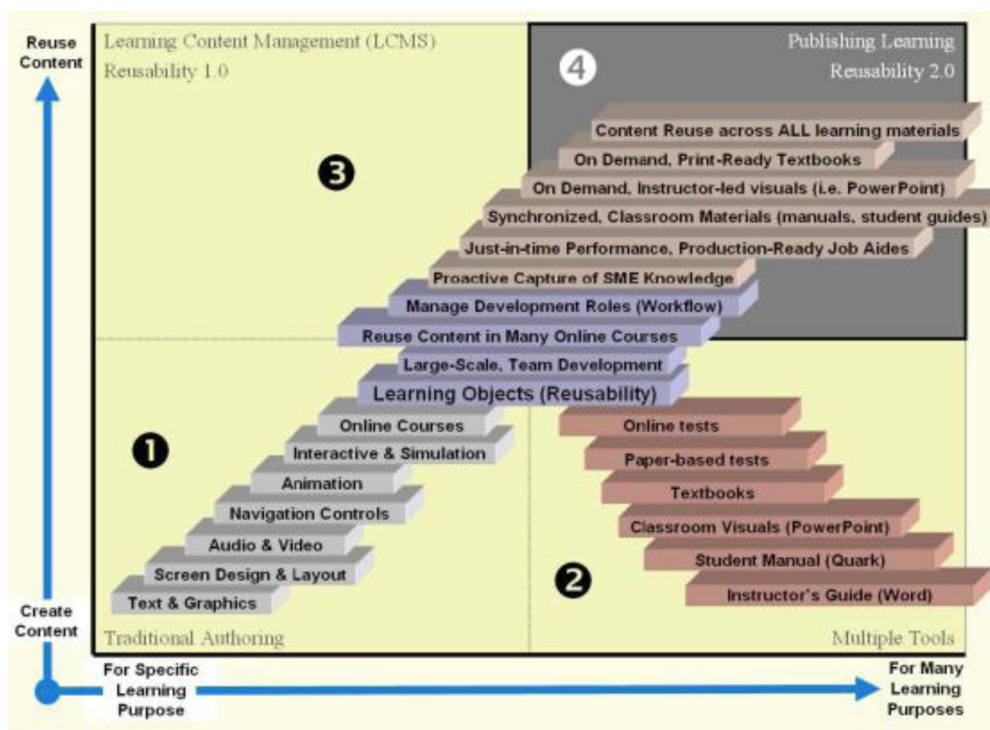
Zone 4 utilizes reusability 2.0 practices to structure content in such a way that it supports the widest possible range of learning materials and interventions through a single-pass production, resulting in automatic synchronization of the content across all delivery formats. Figure 2.0 outlines the advantages and disadvantages of each methodology.

Figure 2.0; *Advantages and disadvantages of different development methodologies*

Zone	Productions Methods	When to Use
1	Create content, for a specific learning purpose, using traditional authoring tools (i.e. Flash, Dreamweaver, Articulate, Lectora Publisher, ToolBook, etc.)	**Advantages** • Highly Interactive • Rich screen layout and design • Portable/self-contained • Low-cost tools **Disadvantages** • Content is often siloed on individual computers –very limited reusability (copy and paste) • Lack of synchronization with instructor-led and print-based learning, etc. • Steep learning curves to master toolsets
2	Create content, for many learning purposes using multiple tools (i.e. Word, FrameMaker, PowerPoint, Multimedia Authoring tools, etc.)	**Advantages** • Best of breed tools are feature rich for intended purpose • Content creators like working in familiar tools **Disadvantages** • Redundancy in development of learning materials created for different delivery formats, resulting in many versions of the content • Different skill set required to use different tools (not working in a single application) • Difficulties integrating output from different tools • Changes require many modifications, and in multiple files
3	Reuse content, for specific learning purposes, using learning content management systems (LCMS or proprietary, in-house tools) *Reusability 1.0*	**Advantages** • Content can be reused across multiple courses • Content is centrally located, organized and deployed • Changes can be made across multiple courses • Derivative courses can be created for many different audiences **Disadvantages** • Some systems have "plumbing" for reuse across many delivery types, but lack tools to automatically output to print-ready, formatted learning materials; such as lesson manuals, student guides, job aides, textbooks, and other forms of delivery.
4	Reuse content, for many learning purposes, beyond e-learning, using tools that incorporate reusability 2.0characteristics. *Reusability 2.0*	**Advantages** • Single pass production results in automatic synchronization of output to print-ready, formatted learning materials; such as lesson manuals, student guides, job aides, textbooks, and other forms of delivery. • Future proofing content by keeping it all centrally located. • Changes to content only need to be made once. • On-demand customization of content can be achieved across all output types. **Disadvantages** • Requires structure and discipline to achieve full synchronization across all output formats (change management).

Case Studies

Reusability 2.0 holds the keys for moving toward a publishing model of learning, as illustrated by the following case studies. The first two case studies focus on organizations that were already in the publishing business, long before encountering reusability 2.0 technologies; how they made the migration toward full reusability, and the results of their transformation. Publishers have long understood the efficiencies of using a systematic production model to create products. It is no wonder that publishers would be some of the first to apply emerging technology to (1) reduce development costs, (2) decrease length of production time, (3) simplify the process of updating content, and (4) in so doing creating a brand-new type of product offering—allowing end-user customers to create and customize their own learning experience.

Case study #3 looks at how the same principles of reusability and production techniques can be applied to the learning and business requirements of one of the world's largest retailers and how they achieved the same benefits experienced by publishers in supporting a broad-based training effort.

We would like to thank Xyleme, as a sponsor for this research and for introducing us to key stakeholders in each of the case study organizations. We recognize that there are many organizations out there applying reusability 2.0 techniques and that reusability is not exclusive to Xyleme. It was truly a learning experience to get to know and research the transformation that occurred in each situation. There are many great lessons to be learned by examining the transformation that occurred in each of these case studies. Enjoy.

Case Study #1

Vertical Market, Learning Services and Information

Company Profile: This information publisher literally dominates its specialized, technical skills market. In fact, over 80% of professionals in this vertical industry, across the world, use at least some of the company's information and/or learning services. In addition to its textbook line, the company produces and sells training resources (such as lesson plans, student guides, etc.) to thousands of partners and schools around the globe. Their training materials are also delivered as packaged solutions with the primary equipment used regularly by professionals.

Challenges: One of the main challenges facing this publishing company was to reach a new generation of younger, web-savvy learners, looking to access personalized training on demand, adapted for their own specialized needs. Prior to embracing reusability 2.0, the company had already established a successful series of computer-based training (CBT) products in tandem with its textbook line, providing versions of their content as self-paced learning modules (built as comprehensive courses with limited reusability across delivery formats). Making the transition to a new paradigm would require that the CBT business remain a priority while achieving better alignment across the production of other support materials.

Previous Methods of Development: The publisher had been working toward single-source publishing for several years before making the full jump to reusability 2.0. The development team used FrameMaker as a data source to create instructor guides and student manuals. Although CBT development did leverage content contained in FrameMaker, at some point in the process, content had to be transferred from FrameMaker into storyboards and subsequently into multimedia authoring tools; in effect, creating new versions of content, each requiring its own update and review cycle. The problem was compounded by the fact that all course materials—whether CBT, instructor-guides, manuals, text, etc.—needed to be adapted for professional certification, using different equipment, creating even more versions of the content. Eventually, the process became virtually unmanageable without applying substantial resources to customize learning for each configuration and branding training for partners.

The project manager told us "There were actually many attempts to single-source content and to find the best solutions. In the end, there were as many solutions as there were people."

Solution: "Our primary goal in moving this direction [reusability 2.0] was to strategically find a better way to simultaneously develop multiple, learning-delivery formats in support of the needs of our target audience and the way they want to learn," said a manager of the process. "Our vision is to base all our learning solutions on single source of content, rather than develop products in isolation. Even more importantly, by single-sourcing content development we can deliver learning based on specific learner profiles which changes based on their own situations and equipment configuration."

The solution was to convert 700 pages of textbook content (from several textbooks) into a central, XMLbased, reusable-object repository (Xyleme LCMS) and structure learning content so it would feed all target delivery formats from a single SCO (SCORM Content Object), including (1) CBT; (2) classroom manuals, containing instructors guides and student manuals; (3) post-course, just-in-time performance support modules, accessible online; (4) paper-based exams used for certification; and (5) providing a new method for creating custom versions of the textbook materials through on-demand printing.

Reusability 2.0 Output Formats:

Updated Textbook 700 pages

Publish on demand based on equipment configuration, audience demographics, and evolving certification requirements

- CBT
- Classroom Manuals
- Performance Support
- Paper-Based Exams
- Custom versions of textbook

Tactical Approach: The publisher decided to apply reusability 2.0 to their highest profile, flagship product line before applying the process to other mainstream
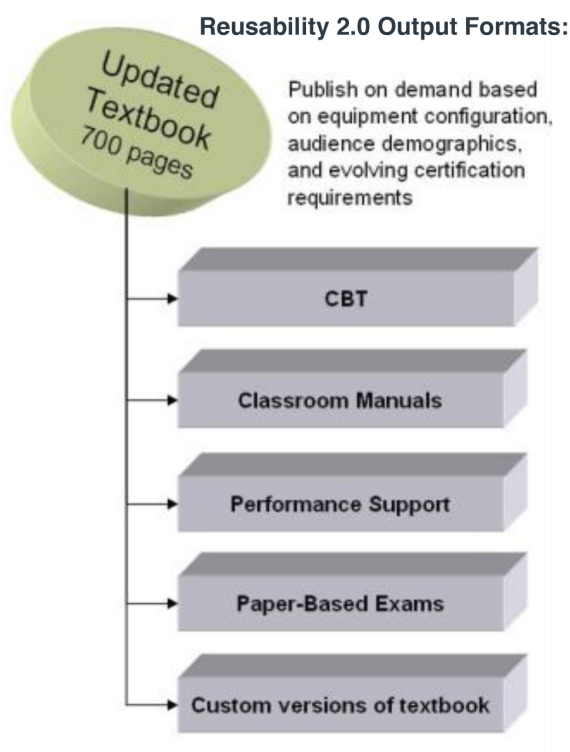
products. The main product is a comprehensive course that prepares learners to obtain a professional license. "Each content area is assigned to a 'triad' – a group of three developers including a subject matter expert (SME), instructional designer, and a technical writer. In total we will have 8 triads working across the entire curriculum. Each team works to update existing textbook content and structure the information to best support all target delivery formats. The role of the SME on the team is to revalidate content to match advancements in technology and advancement in understanding new processes and procedures in each discipline area."

Textbooks for the course are currently rich with graphics and illustrations which work to the advantage of the developers. For example, as new graphics are produced, they are stored in a central digital asset repository in 72 dpi, 300 dpi, and 600 dpi formats in support of synchronizing all delivery outputs. "The system is intelligent enough to pull the right graphic for each delivery type. It uses 600 dpi for print materials and 72 dpi for CBT and just-in-time learning." In addition, interactive learning activities are created specifically for output to CBT, yet stored in the same content repository. "When designing for different outputs, our designers simply tag the right media to match the output type. If we need to make changes to the content, whether a graphic or interaction, all the content is found in the same place for ease of update."

Business Drivers/Results: One of the primary drivers in making the shift is to decrease the expense and complexity in creating on-demand products for customers. Although the project is still early phases of implementation, they are already experiencing the benefits of systematically updating the text as a single-source feed for all development in support of on-demand, customizable learning products that can be used for many purposes. Another, equally important aspect of the project is to continually keep source content as current as possible. According to the project manager, "we've been in business for 70 years. We have a state-of-the-art printing facility right here onsite. The new process will give us the opportunity to do something we haven't been able to do well in the past; that is to make changes to the content that will immediate update and synchronize all our product offerings from classroom materials, to textbooks, and in our CBT courses. The impact of this should not be underestimated."

Case Study #2

Certification Prep and Educational Learning Provider – West Net Learning

Company Profile: WestNet Learning provides information technology courses and learning materials to corporations, educational institutions, training centers and individuals. Over 1000 community colleges, universities, high schools and other academic organizations use their dynamically scalable content. In addition, companies like Cisco and Avaya use WestNet materials to train their own internal employees and partners worldwide. They offer certification prep in many key topic areas including: 3Com, Novell, CompTIA, NACSE, Avaya, Cisco, and Microsoft to name a few.

Challenges: "We're a little different than others in the space. We've been on the path to create single-source content for 10 years now. In the early days, we created many of our own technology platforms for reusability. For a number of years we simultaneously did software development to build reusable content repositories AND developed our own content. We came to the realization that our expertise is in content development, content delivery, managing the process and in integrating learning systems; and not in developing software applications."

The biggest challenge is that the company, from the very beginning, has provided many different types of learning outputs including manuals, study guides, web courses, and self-prep exams, etc. Managing content for all delivery types from a single production pass has been difficult.

Another significant challenge has been coordinating content from hundreds of subject matter experts who live across the globe.

Reusability 2.0 Output Formats:

300 Course Modules (1 to 2 hours each)

"Customers can create their own mix-and-match across 300 modules, and pick the output types they want to use on demand to match their unique learning needs."

- Customizable Manuals
- Individual Study Guides
- e-Courses
- Matching PowerPoint for ILT
- Paper Tests
- Web Tests

Previous Methods of Development: "In our previous development cycles, we would develop a textbook or study guide in FrameMaker. Information was manually extracted to build courses in HTML. We had other developers who would manually create PowerPoint slides for use in classroom, as well as tests, student guides and instructor manuals. Each product was manually built, increasing the cost of course development. Consequently, we couldn't keep the cost down so that our products would be affordable enough for colleges, universities, high schools, or small-to-medium sized companies because the cost of production and customization was just too far out of reach."

"We also have tried several commercial LCMS products, many of which were on the right trail to single-pass production. When investigating solutions, we discovered that many of the systems claim to support multiple output formats, but when you actually pull back the covers, you find that it certainly isn't seamless.

Solution: The solution was to migrate and parse reusable content objects, contained in 300 course modules, each module anywhere from 1 to 2 hours in length, into XML using Xyleme LCMS, and to provide access to hundreds of content contributors, including SME's worldwide.

Tactical Approach: Here's how the process works when creating a new course. First, a project lead creates a design document and taxonomy (master table of
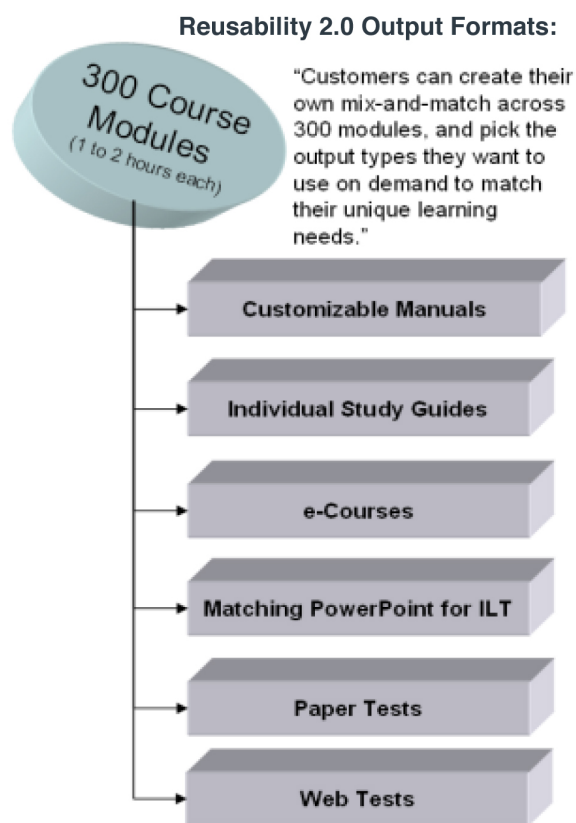
contents) of all topics to be included in the course. Once the topic areas have been validated, sections are assigned to appropriate subject matter experts, regardless of where they live. WestNet uses Xyleme's SME Forms feature to collect information directly from subject matter experts, who are typically high-level, master instructors in their area of expertise, including writing content, objectives, procedures, test questions, adding instructor notes, etc. Because all information is directly fed into the XML database, the next step is for the project manager to review the content and prepare it for publishing. Editors also work on the material for clarity, consistency and grammatical errors. During this phase, graphic artists and animators can also work on visual media to be used in printed materials and inside e-Courses.

"We discovered that one person is able to coordinate and manage the entire process, which might have a dozen SME's working on a particular project. The end result is that following data collection and through a single production pass, we automatically generate all these outputs including a study guide, e-course modules, paper test, web test, PowerPoint for the classroom, and everything else."

Business Drivers/Results: The company has a vision and goal to (1) dramatically reduce the time it takes to create content, by (2) eliminating redundancy from content gathering, through production, to creating learning products.

Using previous, manual production techniques, it often took between 1 year to 1 ½ years to develop all the learning materials associated with a course from date of concept to final release. The result of applying reusability 2.0 is that the process is now compressed to only a few months of development, most of which is spent facilitating data collection. Another important goal was to simplify the process of systematically upgrading and making changes to the content.

"The beauty of this approach is that we can go in and change a module, redeploy the whole package, and the changes appear in all the different learning formats. We don't have to go in manually and change every little thing. We were not able to do that with traditional desktop authoring tools."

The most important goal of the project was to allow end-user customers the ability to build their own courses by designating specific learning outcomes. WestNet customers purchase subscriptions to the content and with the subscription comes the ability to create course materials on the fly.

"Our customers can pick from a list of outcomes and click the go button. Behind the scenes, a custom course is automatically created with all the desired outputs from instructor-led materials, to e-courses, and practice tests."

Case Study #3

**Large Corporate – Yum Brands (KFC, Taco Bell, Pizza Hut and more)**

Company Profile: Yum Brands, Inc. is one of the world's largest restaurant companies with 34,000 restaurants in 106 countries and 900,000 employees. You may recognize their popular brands including KFC, Taco Bell, Pizza Hut, Long John Silvers and A&W, to name a few. To understand the size and scale of this operation, consider the fact that they open 3 new restaurants every day, each year.

Reusability 2.0 Output Formats:

Challenges: From a training perspective, the company has a unique set of challenges including (1) delivering consistent, standard based training to 900,000 employees in 30 different languages; (2) creating derivatives versions of learning content to match brand, equipment configuration, special needs, etc. for each of 34,000 locations, many of which are owned by franchise owners; and (3) provide cost-effective methods for delivering customized content to restaurants that average between 30-35 employees per location.

Previous Methods of Development: "At the center, our focus is on creating standard guides, which is like a standard operation manual. Inside the manual are all the procedures on how to create products, operate human resources at the restaurant level, managing the restaurant; basically everything you need to know to run a restaurant according to a brand standard. The problem was that restaurants require variations in the standards to meet local needs such as variances in regional HR practices, different equipment used to create product, language, etc."

Using a traditional training model, local owners would use standard operating manuals as a source to create onsite training, whether accomplished in a classroom or taught individually, depending on the size and need of each restaurant. From the source material they created instructor-led training materials, new hire orientation, job aides, observation checklists, or any other training as needed.

This resulted in many different versions of operating manuals and related training materials. To compound the problem further, it was becoming increasingly difficult to manage the versions and much of the content was siloed on individual computers and siloed within individual business units.
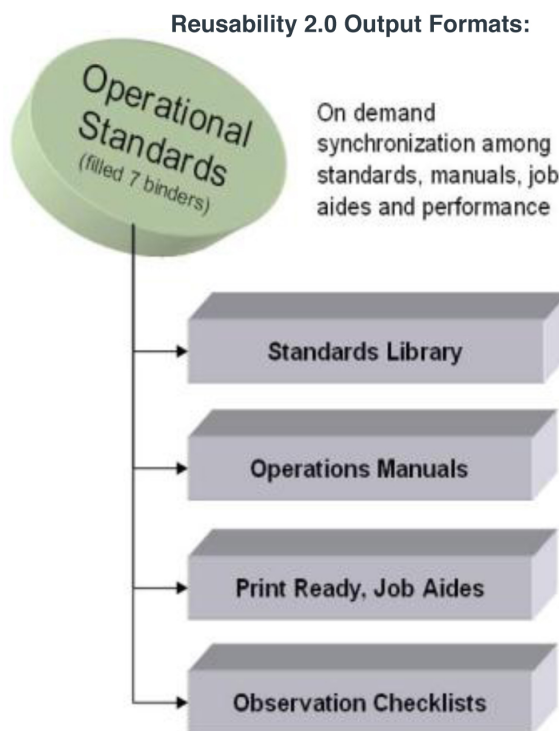
To illustrate the point, when a content audit was done across a number of topic areas, the team identified multiple different, documented procedures to perform the same task. All of the procedures were within safety guidelines and only had minor variances in the process; yet it caused confusion in the restaurant about which procedural task was the "right" one to follow. This led the group to rethink the process for (1) publishing standards, (2) making learning materials more consistent to match brand standards, and (3) synchronizing content across all delivery formats.

Solution: The solution was to migrate approximately 300 word documents that fill seven, large binders into a central repository for the purpose of synchronizing content across all delivery formats including a consistent master resource for creating their operating standards library; master files that can be generated into customized operation manuals, taken regional variables (such as local laws, local product offerings, etc.) into account, print-ready job aides that can be generated from customized operational manuals, laminated and placed at the point of performance; and finally observation checklists used by supervisors and regional managers to evaluate employee performance. Xyleme LCMS was selected to meet this challenge.

Tactical Approach: A large international region was selected for initial implementation, representing 400 restaurants. The first area of focus was to migrate and synthesize a master standards library as a corporate baseline from which derivative versions could be localized for regionally use--basically pulling in the content of all seven binders into an XML database.

Next, in order to synchronize delivery output into all target formats, many of the observation checklists had to be re-written in procedural, rather than in question format to completely align operation manuals with performance appraisals and job aides. For example, instead of saying "did the employee wash hands after touching unprepared food?". The evaluation statement was simply changed to "the employee washed their hands after touching unprepared food." The result was that the system immediately generated, production-ready, illustrated job aides that match training requirements and observation checklists that align completely with operation manuals.

Content developers tag content with specific variables that allow local franchises to literally create their own operating manuals on demand by selecting the brand, type of equipment, regional considerations, language, etc. Based on their selection, Xyleme automatically generates a customized table of contents; includes appropriate sections in the operation manual; auto generates numbering, headers, and footers; and, in short, creates a complete operational manual for a specific brand restraint that completely matches the restaurants configuration and culture.

Yum is in early stages of approaching this new paradigm and plans to take a phased approach. During initial implementation, local franchise and regional owners will still create their own training materials from standard operation manuals; however, the big changes will include a view into the various brand and business unit operation manuals that can provide a consistent corporate baseline, upon which most operational training can take place.

Business Drivers/Results: The business drivers that led YUM to consider reusability 2.0, and the metrics that will be used to judge overall success of the project include:

- Cost reduction
- Self-Serve, On-Demand Personalization of Learning Content Across all Delivery Formats
- Speed of Development
- Ease of Content Maintenance
- Widespread Adoption beyond the first phases of implementation
- Ultimately, the streamlining of the number of redundant procedures associated with performing the same task

Early reactions have been very good. Users are impressed by the ability to create customized operation manuals based on corporate brand standards, job aides and observation checklists. One snag in the road is that some areas still have real issues with access to reliable, persistent internet connectivity. But, in these areas, customized materials can still be created based on regional variations and supplied through traditional channels, such as mailed hard copy documents or CD based versions until connectivity issues can be solved.

In short, any local restaurant owner or trainer can access the site, use a simple wizard to quickly generate their own, complete set of up-to-date, source materials at any time. And at a corporate level, there can be much greater insight into the variances created at the local level. This will ultimately make a world of difference.

"Our perspective is that reusability 2.0 is now emerging as a viable way to address some real business issues. The timing of new technology in the space and our growing needs is just right. If we had tried to solve this problem earlier, it would have been much more difficult and it would have taken us down a completely different path."

Planning A Successful Reusability 2.0 Campaign

Here are some of the lessons and tips we learned while researching case studies about how to successfully apply reusability 2.0 in your organization:

Involve ALL content owners and stakeholders in the planning. The first question you have to ask is: who owns the content? You may discover that there are many different content owners in your organization, such as the knowledge management database being owned by IT, leadership development owned by HR, and skills-based learning materials owned by training. The more people you can bring on board in the planning stages, the more potential synergistic relationships can be forged.

Work from the end product backward. This is one of the most important lessons learned from good examples of reusability 2.0 application. Don't let the technology

become a limiting factor. Try this simple test when evaluating technology. Provide the vendor with a copy of your existing lesson plan or student guide format and ask them to demonstrate how learning content stored in the repository finds its way into printed format. Then ask to see how that content can be quickly redeployed for multi-channel delivery in another format such as e-learning or job aide. Finally, ask them to re-publish a subset of the content and validate that the changes ripple across all output types. You will quickly be able to tell which products have reusability 2.0 and which ones do not.

Leverage a primary data source. You likely noticed in all three case studies that each one leveraged a main body of knowledge at the center of their plan, whether it was a series of textbooks, existing online courses, or a standard operational manual. The problems arose when copies of the data caused redundancy during development, which exponentially grew into an unmanageable problem. This same problem occurs in almost every company. What is your primary data source from which a multitude of versions and variances are derived? How can you best leverage that data? Is it time to apply reusability 2.0 to solve those issues?

Educate, educate, educate on the benefits of reusability 2.0. There may be some resistance to synergistically combining information into a single location and you may also find that some of your content developers actually feel more secure to have the only copy of some learning content on their own computer (hence the issue of content silos). The only way to break this cycle is through communication and demonstrating how content can flow outward to automatically update all content, in every delivery format, globally. This really drives the point home.

Realize that the content will have to be more structured than in the past. Plan on it. Your content will need to be structured in a different way than it has in the past to support all delivery formats and provide on-demand learning. In general many lengthy documents will be broken into much smaller, more granular bits of learning content. It takes some getting used to, but as the case studies indicate, it is worth the effort.

Sr. Management Support. Although it is possible to introduce reusability 2.0 using a grassroots movement, you are much more likely to succeed if you have the blessing from Sr. Management, especially if they are part of the vision. Reusability 2.0 isn't just about developing business efficiencies; rather many of the benefits have bottom line impact as you align learning technology with your business initiatives, such as creating entire new, self-service, on-demand learning products.

Summary

Reusability 2.0 is not for everyone, nor is it for every training situation. If you are designing a learning intervention that can be readily delivered using a singular delivery format, without many variations, applying this methodology would be overkill. However, if your vision is to systematically synchronize content across all delivery formats and/or you need training to be highly adapted for different learning environments; reusability 2.0 is the key to publishing learning.

About The Author

Bryan Chapman is Chief Learning Strategist at Chapman Alliance; a provider of research-centric consulting solutions that assist organizations to define, operate and optimize their strategic learning initiatives. As a veteran in the industry, he has over 20 years' experience and has worked with such organizations as American Express, Shell, Kodak, Sprint, Sharp Electronics, Honda, IBM, Microsoft, Avon, UNICEF, The Food and Drug Administration, U.S. State Department, and many others; to help them optimize learning efficiency through the use of innovative learning techniques and technologies.

Bryan was formerly the Director of Research and Strategy for independent research and consulting firm Brandon Hall Research, where he served as the primary author and researcher on high profile projects such as the LMS Knowledgebase, LCMS Comparative Analysis Report, Comparison of Simulation Products and Services, and a comprehensive study of custom content developers in the industry. In addition, Bryan was responsible for structuring Brandon Hall Research's consulting practice. He continues to provide technology-selection services in partnership with Brandon Hall Research as a registered Associate.

Chapman Alliance

(801) 568-7011

bryan@chapmanalliance.com

About Xyleme

Xyleme, Inc. is the leader in standards-based learning solutions that enable the personalized delivery of training content. Xyleme's suite of products is powered by Xyleme LCMS, a 100% XML-based single-source platform. It provides the industry's most efficient content development platform for the rapid reuse of content across all types of print, eLearning, tablet and mobile outputs.

The Xyleme™ product suite also includes Bravais™, Xyleme's cloud-based solution to deliver personalized learning to any device. Pastiche® is Xyleme's end-to-end solution for rapidly deploying interactive and privately branded iPad or Kindle Fire apps.

The adoption of the Agile Development framework enables the release of new Xyleme LCMS, Pastiche and Bravais versions every three months compared to the industry standard of 12 to 18 months.