High Value and Low Bandwidth: Crown Cork & Seal’s $3 Million Savings

BY JACQUELINE D. BECK

One of the great advantages of e-Learning is its flexibility. The designer and developer are not restricted to a single delivery channel, so the solution they create can fit the client organization’s needs, and not the other way around. Here is a brief case study summarizing a recent project with many challenges that could only have been met by using a hybrid solution.

Crown Cork & Seal makes one out of every five beverage cans used in the world and one out of every three food cans used in North America and Europe. To ensure the health and safety of millions of consumers — and to satisfy customers like Coca-Cola, Dole, and Anheiser-Busch — Crown is dedicated to manufacturing the highest quality products.

Crown invests heavily in employee training to support its quality manufacturing process. Every year, Crown trains 15,000 people at more than 250 plants around the globe, usually in an instructor-led classroom setting. Unfortunately, classroom-based training often costs tens of thousands of dollars per day. To reduce the cost of its employee-training program, Crown decided to replace certain instructor-led courses with Web-based training applications, when the content would lend itself to this type of format.

Transforming classroom instruction into Web-based training, Crown decided to first convert a course that instructs production line supervisors how to calibrate and maintain the gauges used to measure product dimensions. The one-day instructor-led version of “Gauge

Continued on next page
The eLearning Developers’ Journal™ is designed to serve the industry as a catalyst for innovation and as a vehicle for the dissemination of new and practical strategies and techniques for e-Learning designers, developers and managers. The Journal is not intended to be the definitive authority. Rather, it is intended to be a medium through which e-Learning practitioners can share their knowledge, expertise and experience with others for the general betterment of the industry.

As in any profession, there are many different perspectives about the best strategies, techniques and tools one can employ to accomplish a specific objective. This Journal will share these different perspectives and does not position any one as “the right way,” but rather we position each article as “one of the right ways” for accomplishing a goal. We assume that readers will evaluate the merits of each article and use the ideas they contain in a manner appropriate for their specific situation. We encourage discussion and debate about articles and provide an Online Discussion board for each article.

The articles contained in the Journal are all written by people who are actively engaged in this profession at one level or another—not by paid journalists or writers. Submissions are always welcome at any time, as are suggestions for articles and future topics. To learn more about how to submit articles and/or ideas, please refer to the directions in the sidebar on page 6 or visit www.eLearningGuild.com.

Paul originally expected. During the project, the development teams discovered that Crown’s content would need to be available for distribution on CD-ROM as well as over the Web. Crown has 250 plants worldwide, and only 140 of these are in North America. Some locations have Internet access, and some do not. This meant that distribution would have to be a hybrid. In addition, some of the locations with Internet access were on slow (28.8Kbps) dial-up connections. Authorware supports packaging content for CD and for the Web with the same file, and it can be optimized for low bandwidth. As a result, every user would receive the same content, we could include text, visuals, sound, and animation on every page, and we could keep the page sizes between 15K and 25K.

In effect, Macromedia also became a partner on the project. We use Macromedia solutions because they make our jobs easier and our clients love the results. As a “Training and Alliance Partner” for Macromedia, we have a close relationship that we can leverage for our clients.

Sidebar 1 on page 3 summarizes the Crown Cork & Seal project deliverables.

Project development

We developed two courses as part of this project. The first course, “Gauge Capability Training” carried a price tag of $27,000 for an average size class of 20 employees.

Getting the project started

Paul Palumbo, Director of Training for Crown, quickly realized that the company did not have the in-house expertise to develop the Web-based courseware. After considering a number of development firms, Paul chose to partner with my company, Brookwood Media Arts. This decision was based on our instructional design background and our capability with Macromedia development tools. Paul also asked us to provide training in Authorware for eight of Crown’s trainers so that Crown could bring development in-house and have pre-built courses to use as templates.

An important reason for making support for Macromedia a selection criterion was that Crown had previously selected IBM’s Mindspan LearningSpace as their Learning Management System (LMS). This tool is AICC-compliant, rather than SCORM-compliant, and it was important to be able to track the courses through the LMS. (See Figure 1, below.) Authorware is fully AICC compliant and provides seamless integration to Mindspan LearningSpace.

As it turned out, the Macromedia connection was even more significant than...
Capability Training,” was based on the classroom presentation, but was not a literal conversion. (See Figure 2, below.)

I worked from a text manual and attended the instructor-led course taught on-site by an outside consultant. Because the consultant only presented this course once every six months, I videotaped the class. This gave me references to the specific content. In addition, the Cork & Seal trainers provided me with a “goals and objectives” document. My intent was to build easy-to-understand lessons for the “low-end” students.

In addition to the “Gauge Calibration” course, we also developed a course on Crown Cork & Seal’s database program for storing information about gauges. I created simulations of the software so students could see, hear, and use the software within the learning modules just as they would the actual software. By building “useful interactions” with rich media, we find that we can maximize retention rates with self-paced learning.

In our experience, students must engage in the program and make use of movement, sound, visuals and interaction to learn the content and be successful with any type of distance learning endeavor.

Coordination and communication are critical

It is important for readers to realize that I am not a technical person. It was a big advantage to have the various subject matter experts (SMEs) in the company break down the objectives into small chunks for me. This ensured that the deliverable would be “easy-to-understand,” as intended, and accurate.

We hosted an extranet site at Brookwood for the Crown Cork & Seal team, so they could see our progress on a daily basis. As milestones and edits were updated, we would send an email to Paul. His people could then go into the course, review specific sections, and provide detailed feedback for us by return email. As sections were signed off, the Brookwood developers could constantly drive forward to a completed course.

As noted earlier, the Crown system was AICC-compliant. As a result, we did not tag the content through their LMS (LearningSpace). This was not “Reusable Learning Object” (RLO) courseware. However, we did create a library and clip-art CD for the post-training class. This allowed us to go over the content created in the 50+ subtopics and make sure everyone was up to speed. All eight of the trainers who attended the Authorware class after the project was completed were sent a CD of the images, sounds, and animations. These eight people were going to be building follow-on content in-house, and communication is critical for any re-usable elements even if they are not, strictly speaking, RLOs.

Rich media enhances the learning experience

Further to the comment above about the importance of useful interactions, to enhance the online learning experience, my team and I used “rich-media” for all the courses. It was my job to design simple illustrations, capture screen shots, build animations to simulate topics, and use scanned images provided by Crown Cork & Seal to show a graphical representation of each and every topic for a more visual learning experience. Narration added to every page increased retention rates.

The sound engineers were able to achieve excellent compression rates by using Shockwave audio with the sound files. Originally, the sound track for the “Gauge Calibration” course included 79 files and was over 50 megabytes; we were able to compress and optimize the sounds down to 415K for all 79 files. (See Figure 3 on page 4.) This type of compression and optimization makes it possible to stream sound to a 28.8K modem. Building rich media for slow bandwidths requires a lot of attention to detail as well as experience, and the project plan must allow for this.

SIDEBAR 1 Summary of project deliverables

• Development using Macromedia Authorware (AICC Compliant) for two courses
• Integration with Learning Management System (LMS): IBM Mindspan Learning Space (AICC Compliant)
• On-site training for eight Crown Cork and Seal trainers in Macromedia Authorware
• Provide templates, models and Graphical User Interface (GUI) to speed development for trainers at Crown Cork & Seal
• Provide ongoing consultation and a “mentoring” relationship to support the e-Learning initiative

FIGURE 2 The “Gauge Capability Training” program was based on the classroom presentation.

FIGURE 3

Interactive Gauge Capability Training

R&R Studies—Page 9 of 18

CROWN CORK & SEAL

R&R Study

Operator: John Doe checks all 3 samples twice, in random order, so that you have a total of 6 readings from the 3 samples to enter into MSA Quantum.

<table>
<thead>
<tr>
<th>Sample 1</th>
<th>Sample 2</th>
<th>Sample 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.285</td>
<td>3.286</td>
<td>3.283</td>
</tr>
<tr>
<td>3.286</td>
<td>3.284</td>
<td>3.283</td>
</tr>
</tbody>
</table>
Speeding downloads with streaming media

My concerns about download speeds were based on a specific client requirement. Paul Palumbo had informed us that Crown’s standard was a 56Kbps modem, and related his unhappy experience in this regard with off-the-shelf courses he had already purchased. Several Crown Cork & Seal manufacturing plants are located in remote areas with minimal data communications infrastructures. We learned that, even though the standard was 56Kbps, at least one plant uses 28.8Kbps modems to connect to the Internet. As a result, it was very important that the online training courses run smoothly even over slower analog modems.

Thanks to Macromedia Authorware and Fireworks, we were able to make the modules very interesting and easy to understand using graphics, animation, narration, and interactivity. The best part of all was the performance. On a 28.8K connection, we were still able to stream rich media, including narration, to each page of every subject.

Tracking and reporting

Our contract required that we create the courses under the AICC guidelines to communicate with AICC-compliant, IBM Mindspan - LearningSpace. We inserted the appropriate API calls, CMI functions and variables, meta-tags, and other necessary code so the LMS can track the courses and retrieve the scores from the shell of the custom content we created. (See Figure 4, below.) We also verified that the courses communicated effectively with the LMS and that they adhered to the major guidelines from AICC.

As part of the turnover process after training was completed, we provided ongoing coaching and mentoring to the Crown trainers to ensure their success. We also produced templates, models and job-aids to support their in-house efforts. In this way, they knew exactly what would be needed to make compliant the courses they later developed in-house.

Summary and lessons learned

While my team as well as the trainers at Crown Cork & Seal were pleased by the results (see Sidebar 2 on page 5), no project ever goes perfectly. Therefore, I have a few experiences to share with you.

First, one of the lessons we learned was to include many different eyes other than just the SME’s to review sections. With only a few people constantly reviewing the content, you tend to lose perception and sometimes do not catch the little mistakes and typos.

Have someone who will be “engaged in the training” (that is, one of the people who will take the course) on the review team. If the content is too high-level, this person’s feedback will be critical for designing content that everyone will be able to use.

Rich media was a huge part of this project, so it is not surprising that we learned — or were reminded daily of — a few critical practices. Rich media includes sound, images, and animation. When the Web is less constrained, video will also be included in rich media, but it is not there yet.

We always recommend use of GIF images for visuals like screen shots, illustrations, or clip art, where a smaller palette (fewer colors) is involved. Photographs contain thousands of colors and require JPEG format, so that the image file size can be greatly reduced, yet retain a high level of quality. If a photographic image is saved in GIF format,

FIGURE 3 It is important to achieve high levels of media file compression and optimization for low-bandwidth situations.

FIGURE 4 This Progress Report is part of the tracking and reporting capability built into the courses.
the palette will be averaged and the image will look blurry. When your staff is making screen shots or preparing digital photos for use by the contractor, they must appreciate the importance of these guidelines when they choose the file format for saving. I realize this is basic to most readers of this article, but it may be news to many on your team.

Sound is also critical to a richer program. Using tools like Shockwave audio (included with Macromedia Authorware) allows us to compress WAV files up to 95% and still retain good quality. This is critical. If you have a 15-second narrat-

SIDEBAR 2  Project outcomes

- $3 million saved yearly from reduced training costs
- More people are taking more training classes for less money
- Authorware courseware integration with the company’s LMS provides increased testing, scoring, reporting and tracking capabilities so Crown Cork & Seal can better manage their corporate training functions and their employees performance
- By training the in-house team to use Authorware, Crown Cork & Seal now benefits from a condensed development schedule and reduced maintenance costs
- Consistency by reusing sound files and clipart created with Authorware and utilizing a standard, easy-to-use navigational system

San Francisco, California • November 12 – 14, 2003  Pre-Conference Workshops November 11, 2003

The Essential Conference for e-Learning Designers, Developers, and Managers

The program is divided into three core practice areas that mirror the three main roles that e-Learning producers are engaged in – Designer | Developer | Manager. The Program Committee, comprised of volunteer Guild Members, has identified the most critical topics that address these areas and those topics will be the focus of all our General Sessions, Think Tank Sessions, Concurrent Sessions and optional Pre-Conference Workshops.

Every session is designed to allow time to hear from the experts, debate and discuss with your peers and explore topics to their fullest. In addition to the structured time you will spend learning in the sessions, you will also have ample opportunity to network with the other participants in morning discussion groups, over lunch, and during social activities. The size and format of the conference will help you develop important professional connections during the conference that you can continue in the months and years to follow.

Workshop descriptions online now! Visit www.eLearningGuild.com
Do you have an interesting story to tell?

Get It Published in...

This publication is by the people, for the people.

That means it’s written by YOU the readers and members of The eLearning Guild! We encourage you to submit articles for publication in the Journal.

Even if you have not been published before, we encourage you to submit a query if you have a great idea, technique, case study or practice to share with your peers in the e-Learning community. If your topic idea for an article is selected by the editors, you will be asked to submit a complete article on that topic. Don’t worry if you have limited experience writing for publication. Our team of editors will work with you to polish your article and get it ready for publication in the Journal.

By sharing your expertise with the readers of the Journal, you not only add to the collective knowledge of the e-Learning community, you also gain the recognition of your peers in the industry and your organization.

How to Submit a Query

If you have an idea for an article, send a plain-text email to our editor, Bill Brandon, at bill@eLearningGuild.com, with the following information in the body of the email:

- **A draft of the first paragraph**, written to grab the reader’s attention and identify the problem or issue that will be addressed.

- **A short outline of your main points** addressing the problem or resolving the issue. This could be another paragraph or it could be a bulleted list.

- **One paragraph on your background or current position** that makes you the one to tell this story.

- **A working title** for the article.

- **Your contact information**: name, job title, company, phone, email. This information is to be for the writer of the article. We are unable to accept queries from agents, public relations firms, or other third parties.

All of this information should fit on one page. If the topic fits our editorial plan, Bill will contact you to schedule the manuscript deadline and the publication date, and to work out any other details.

Refer to www.eLearningGuild.com for more details.

... include many different eyes other than the SME’s to review sections. With only a few people constantly reviewing the content, you tend to lose the perception and sometimes do not catch the little mistakes and typos.

plus text and still keep the page under 20K.

One reason that our courses in this project performed well is that we were stingy about file size and worked hard at compression and optimization. Any vendor and instructional designer you bring in for your projects should understand rich media and slow bandwidth limitations, so that you get a program that performs with no delays on the low-end systems in your organization.

Finally, I would like to leave you with one thought. In the design process, it is the instructional designer that drives the budget for your course. The designer must understand these elements in order to design an effective course, no
matter what software you choose. Without that understanding, you will get a course that has features you cannot afford, and one that will not play through your enterprise without delays.

AUTHOR CONTACT
Jacqueline D. Beck is the Vice President, E-Learning at Brookwood Media Arts, just outside Philadelphia. Jacquie has a Master’s Degree in Instructional Technology and has been creating interactive learning programs since 1988. Jacquie specializes in instructional design, course development and project management for e-Learning. Some of her clients include Ford Motor Company, Sony Music, The FBI Academy, Air Products, Wyeth, Crown Cork & Seal, BMW, Mercedes Benz, U.S. Navy, and the U.S. Coast Guard. Jacquie can be reached at 215.643.8580, ext. 104 or by email at jacquie@brookwood.com.

ONLINE DISCUSSIONS
Extend your learning beyond the printed page! If you are looking for more information on this topic, if you have questions about an article, or if you disagree with a viewpoint stated in this article, then join the online discussions and extend your learning.

Follow these easy steps to participate:
2. Click on the Online Discussion link on the left-hand navigation menu.
3. Select this article by title from the e-Learning Discussions list, or use the Search Subjects/Post box to find it.
4. Click on Add A New Message.
5. Enter your message. It will be posted as soon as you hit the Add Message button on the form.

Additional information on the topics covered in this article is also listed in the Guild Resource Directory.

The eLearning Developers’ Journal™
The Guild publishes the only online “e-Journal” in the e-Learning industry that is focused on delivering real world “how to make it happen in your organization” information. The Journal is published weekly and features articles written by both industry experts and members who work every day in environments just like yours. As an active member, you will have unlimited access to the Journal archive.

People Connecting With People
The Guild provides a variety of online member networking tools including online discussion boards, and the Needs & Leads™ bulletin board. These services enable members to discuss topics of importance, to ask others to help them find information they need, and to provide leads to other members.

Become a member today! Join online at www.eLearningGuild.com.

Resources, Resources, Resources
The Guild hosts the e-Learning industry’s most comprehensive resource knowledge database. Currently there are over 2,300 resources available. Members have access to all of these resources and they can also post resources at any time!

Guild Research
The Guild has an ongoing industry research service that conducts surveys on 20 topics each year. These topics are identified by the Research Advisory Committee. The data collected is available for all members.

It’s About Leadership
The Guild draws leadership from an amazing Advisory Board made up of individuals who provide insight and guidance to help ensure that the Guild serves its constituency well. We are honored to have their active engagement and participation. The Guild has also established three committees made up of active members who help steer its editorial, events program and research efforts.

Discounts, Discounts, Discounts
Guild members receive discounts on all Guild conferences and on other selected products and services. Your Guild membership will save you 20% off the list price of Guild events!

Join today at www.eLearningGuild.com!

THANK YOU TO THESE GUILD ENTERPRISE SPONSORS

allen interactions
Because the most dramatic learning happens through first-hand experience, everything we do is focused on creating experiences — engaging, challenging and yes, fun, experiences — that people will take back to work and use every day to improve their performance.

www.alleninteractions.com
Contact: Jackie McNamara
jmcmillan@allenii.com
800.204.2635

Cyclone Interactive
Cyclone Interactive is an interactive media and web development firm creating online, CD and presentation solutions for a wide range of clients and industries.

www.cycloneinteractive.com
Contact: Earl Dimaculangan
earl@cycloneinteractive.com
617.350.8834

To learn how to become a Guild Enterprise Sponsor, please contact David Holcombe at dh@eLearningGuild.com or call 707.566.8990.