



Innovation Case Study

Standardizing eLearning in a Decentralized Setting using a Templating Approach

Abstract

In the spring of 2006, after being dissatisfied with the limitations of the eLearning authoring technologies offering, Pratt & Whitney Canada's Learning and Development team began looking for a custom built solution to meet their organization's needs. Essentially, what they were looking for was a media independent content development environment which would facilitate rapid updating and translating for decentralized international implementation, all this at a feasible cost.

Large scale eLearning development at Pratt & Whitney Canada

PWC's Learning and Development (L&D) team's first major challenge was their need for a tool that would permit decentralize development of eLearning courses all the while keeping a certain uniformity in style and standards throughout the whole organization. At PWC, eLearning course content can come directly from the central corporation group, but at times will be generated by local (decentralized) business units to develop their own content locally. The solution they were seeking should work for both.

The L&D team was also looking for a solution where the content presented in an eLearning course would not be locked into the technology that would display it. The problem, as they saw it, was that once content is locked into a specific technology, it becomes technology dependant. Dependence on technology is a very dangerous and often costly thing, a lesson most have learnt the hard way.

Locked content in media has several disadvantages. In the end, they all come down to time and cost. Once content is locked in, updating, modifying and translating content becomes a time consuming operation as the new text often requires not only reintegration but media repackaging.

International implementation also added further weight to the translation factor. It was necessary for PWC to quickly translate their courses for European and Asian markets, initially from English to French, Polish and Mandarin, with other languages to come. Furthermore, international divisions would likely have to translate their own course and perhaps even develop new courses.

In addition, the licensing cost for the production tools were in most cases quite expensive. The L&D team envisioned distributing an eLearning authoring tool throughout the various divisions of Pratt & Whitney International. This would mean large scale development in a decentralized fashion. The cost models of existing tools was not compatible with PWC's large distribution needs.

As a result of these factors, the gap was widening between L&D team's needs and the existing eLearning authoring solutions. Many tried to win them over by emphasizing the numerous features their products had. However, the "idea that more features is better" was a fallacy, according to them. It was their opinion that many eLearning production tools were overloaded with features that only complicate and prolong the development process.

The L&D team's objective was not to build a few extraordinary, award-winning courses. They had a mandate to rapidly develop a larger quantity of courses that were of good quality and instructionally solid. In doing an extensive product search and analysis for the right eLearning



authoring technology to drive their project, they ascertained that what the market offered didn't meet their requirements. They realized that a custom built tool was required to meet their needs.

When even a solutions-based world didn't offer the right solution

When the L&D team concluded that the solution to their problem didn't exist, they began assessing the exact type of eLearning authoring technology required to match PWC's needs, while considering how much they were willing to invest in this technology to make it feasible and cost-effective.

In the spring of 2006, the L&D team contacted ELab e-learning Group Inc, as well as other local firms, requesting a presentation on how ELab e-learning Group could design a tool that would meet their needs.

ELab e-learning Group was already half way to the L&D team's solution. They had been developing their eLearning course using a templating approach. Essentially, templating is a process by which pre-developed page layouts are used to create new pages from the same design, pattern, or style and by which there is a separation of form or structure from content. Essentially, ELab e-learning Group streamlined the instructional design process by developing storyboard guides, in which the types of eLearning activities were determined on a per project basis. From this, ELab e-learning Group created interactive multimedia templates matching each activity and page type using Adobe Flash technology and would then integrate the content into each of these templates.

The remaining gap between ELab e-learning Group's solution and the L&D team's needs was that they wanted a series of pre-programmed templates that didn't require a multimedia developer's involvement at the content integration stage.

ELab e-learning Group examined its production workflow, analysing how the templates could be programmed in such a way that adding text from an outside source would be possible. It was decided that the most efficient method was to use a formatted Extensible Markup Language (XML) file as an external data source for the Shockwave Flash (SWF) movie. XML is a tagged based language that is a universal data format for sharing data among different information systems including the Internet.

ELab e-learning Group created a light-weight (100K) and unique Flash SWF movie that is composed of a series of intelligent, interchangeable and reusable templated pages and that manages the output presentation. This Flash movie can be modified, re-ordered at will and populated by content structured in the XML file it calls. In addition, Cascading Style Sheets (CSS) technology is leveraged to format the data, so that every aspect of the final output could be controlled from the outside. With this approach, the instructional designer need only update the XML document to change any aspect of the content displayed in the Flash SWF movie (see Figure 1).

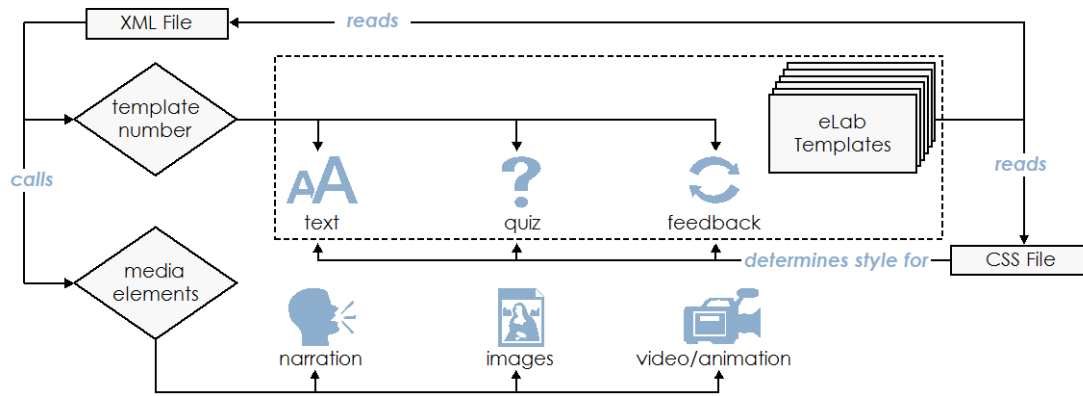


Figure 1 - XML as an external data source to Flash SWF

Another consideration the L&D team had was having a product that would be universal and that would play smoothly even in low-bandwidth areas. Adobe Flash is a software application used to create rich internet applications containing graphic illustrations, sound and interactivity. Because it uses vector graphics, the graphics are rendered smoothly and the end product is an antialiased, optimized and resizable file format that is small enough to be downloaded seamlessly on a low bandwidth modem connection.

By this time, in late spring 2006, Flash Player 9 had just been released; therefore a decision was made to develop for the previous version in order to avoid a need to for mass Flash Player updates. By June 2006, Flash 8 had a penetration rate of 86% in Mature Markets (US, Canada, UK, Germany, France, Japan) and 83.1% in Emerging Markets (China and S. Korea). By December, the penetration rate in Mature Markets grew to of 94.2% and to 86.4% in Emerging Markets (which now also included Russia, India and Taiwan).¹

This application was a fit with The L&D team’s vision and a contract was awarded in June 2006. Production began and a few months later, in September 2006, the first phase of ELab e-learning Group’s eLab (acronym for eLearning Application Builder), the eLab *Player*, was born.

Working together to fine tune the solution

Over the course of the summer of 2006, the L&D team put together a team of instructional designers and gave them the challenge to design 25 templates for the eLab Player. The challenge meant creating templates that would meet about 90% of the instructional design needs. The designers were instructed to make their design choices carefully, because these templates would be the only ones integrated to the original version of the eLab Player, meaning they would have to live with the choices they made.

When the L&D team was questioned over the need for such strict guidelines and limited choices, they explained that “by working with imposed limitations, one has to be more creative in their

¹ Millward Brown - Worldwide Survey, (2006). *Adobe Flash Player Version Penetration*. Retrieved March 10, 2007, from Adobe Web site: http://www.adobe.com/products/player_census/flashplayer/version_penetration.html



design”. The L&D team was referring to the controlled creativity as opposed to the limitless creative expression. Essentially, they wanted ELab e-learning Group to create a tool that would “streamline the right stuff”, such as navigation and activity-types, which would enable instructional designers to focus on the content and learning activities.

When designing the eLab interface, ELab e-learning Group kept the same simple approach. In fact, the simple screen design approach is one ELab e-learning Group has always practiced, recognizing that “[a] central challenge facing designers of multimedia instruction is the potential for cognitive overload—in which the learner’s intended cognitive processing exceeds the learner’s available cognitive capacity.”²

The eLab Player’s interface and templates are simple to use without being simplistic. The complexity is in the design and in the possibilities rather than in the delivery. eLab not only takes out a lot of the guess work for designers, but also ensures that extraneous materials that might cause cognitive overload will be weeded out for the end-user: the learner.

Adding dimensions to eLab while keeping it simple

One of the major challenges for implementing the solution in the client’s environment was that though editing an XML document was easy for an experienced multimedia developers, the learning curve, though not all that steep, was somewhat of a hindrance to instructional designers that didn’t necessarily master code-based authoring tools. The initial team of instructional designers, who devised the original eLab templates, were trained to use XML editors and they were able to design courses rapidly and with very little difficulty.

Nevertheless, in the fall of 2006, the L&D team requested that a desktop-based editor be developed that would facilitate the structuring of the XML document (and therefore the structuring of any course) that would hold the content as well as permit the editing of the specific XML tags. This editor had to have the capability of being implemented without an installation package³, and not require system administrator privileges to work on a designer’s desktop, nor require the need to interact with a database or a server.

Based on The L&D team’s criteria, the eLab Editor was born. The eLab Editor is just that, a standalone desktop-based application that generates the requisite set of files and folders to create a course (see Figure 2). Once the course is created, the eLab Editor enables rapid integration of content, the configuration of quiz and activity settings and the reorganisation of modules, units and screens.

² Mayer, R., & Moreno, R. (2003). *Nine ways to reduce cognitive load in multimedia learning*. *Educational Psychologist*, 38(1), 43-52.

³ eLab comes standard with an installer, however eLab’s structure is so simple that PWC was able to easily bypass it.

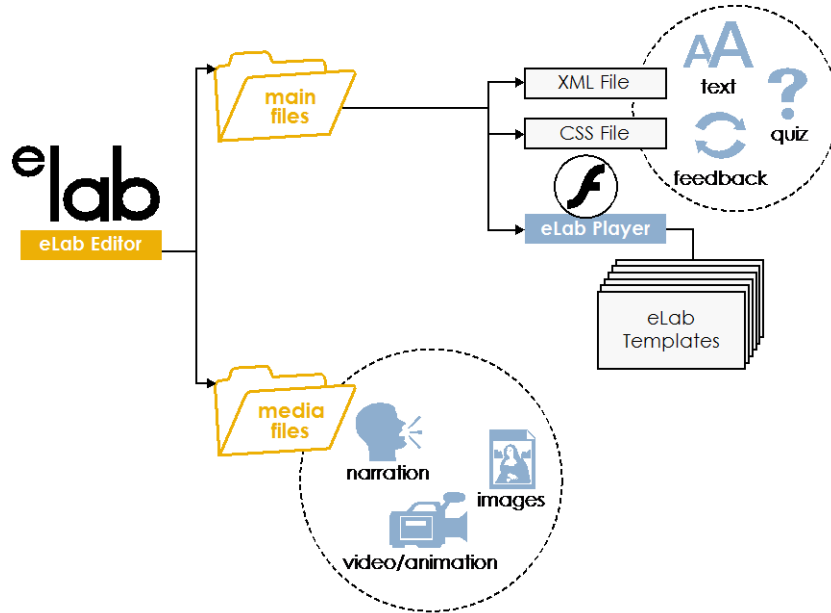


Figure 2 - How the eLearning Editor works

Because the eLab Editor generates a set of independent, universal files, they are easily uploaded onto an intranet or into any LMS/LCMS platform. This gave the L&D team the flexibility they wanted.

ELab e-learning Group also built eLab with expansion in mind. Additional templates can be added, if new needs arise. In fact, PWC has an agreement with ELab e-learning Group to develop additional templates in the future. ELab e-learning Group is working closely with PWC's team to constantly improve both the eLab Editor and Player. For example, in April of 2007, ELab e-learning Group added a text editor linked to the stylesheets. All changes have one goal in mind: simplifying the task for all instructional designers.

Innovation: Going back to the basics

Often times when we think of innovation, we think of ground-breaking, revolutionary and much too often "new and improved features". eLab, in a sense, is the opposite of that.

eLab was innovative in that it went back to the basics. It was about integrating best practices and streamlining them into a tool that was easy enough to use, while having the flexibility of many complex tools.

eLab, used effectively by an experienced instructional designer, produces a solid eLearning course in *rapid* time. Moreover, this course can be modified, translated and updated in *record* time and cost.



The L&D team considered the implementation of eLab as “putting the values back in the right places”, meaning the focus is on the instructional design rather than on the multimedia show, which though at times delightful, too often threatens to go over the top.

In addition, the cost structure of eLab, that is one corporate license with unlimited installation within the corporation, was an approach that was a right fit with PWC's needs.

Organisational change through eLearning

Courses and departments are often chosen carefully when piloting new eLearning initiatives in an organization. However, the L&D team took a bolder approach in simultaneously requesting the development of a mission critical course by their team of instructional designers. The results were fantastic.

As mentioned earlier, the initial team of instructional designers were able to deliver three important courses with varying thematic and approaches, all using the eLab tool. The three courses are: a foreign object detection course, communicating critical knowledge for those assembling engines and turbines, a business warehouse course providing training on one of PWC's main reporting applications, as well as a course for the procurement department. Since then, eLab has been distributed to a team of experienced PWC instructional designers and their feedback has been outstanding.

The courses developed with eLab have been well received and are being used extensively. The L&D team recognizes how implementing eLab has helped him “convert the organization from the inside”, democratizing the use of eLearning throughout the company. Managers see end-users enjoying and benefiting from the courses and are impressed with the results, bringing about attitudinal change about eLearning.

About ELab e-learning Group

ELab e-learning Group provides complete and cost-effective solutions for print publishing, video, multimedia, Web development and eLearning. Its eLearning division focuses primarily on conducting systemic needs analysis in order to devise a strategy aligned with clients' performance expectations. They specialise in the design and development of applications ranging from social computing, Communities of Practice and eLearning/Web 2.0 to LMS implementation as well as eLearning courseware, now simplified with the launching of [eLab](#).