Peeling the First Two Layers of the e-Learning Onion:

Designing and Developing an In-house e-Learning Program

BY RUSS MCNALLY

It was the morning of January 7th, 2003, and I arrived early at work in Tokyo with a sense of anticipation because today was the day! Today was the launch day of the AIG Companies, Japan, nationwide online English-language telephone training program. I had spent the last nine months preparing for this day. It was like waiting in line for a roller coaster. I usually get this sense of excitement because I know the ride is going to be fun, but at the same time, the wait fills me with dread because I am always thinking, "What happens if the roller coaster derails or I fall out?"

That's how launching my first AIG online training program felt. When I arrived at work, I turned on my PC and then went to get a can of coffee out of the vending machine, so I could sit down and drink in the feeling of accomplishment. (Yes, you can buy canned coffee out of a vending machine in Japan along with a number of other items like corn soup, cigarettes and beer, although thankfully some of these items are not available in the office.)

As my PC slowly came to life, I sipped my coffee savoring its strong, bitter taste. When I clicked the Internet Explorer icon on my desktop and typed in the address for the online telephoning course login page, I saw one of the most terrifying things I could have imagined.

Written across my login.asp page was the word "*ERROR.*" My initial thought was, "Don't panic. You must've typed in the wrong address." Imagine my horror when I typed it in again and the same message stared back at me! *ERROR! ERROR! ERROR!* Nine months of blood, sweat and tears! Oh, the humanity! I felt like my roller

There are plenty of challenges in the many layers of an e-Learning project. In this update about online instruction in Japan, Russ McNally applies several ideas previously published in The Journal. Avoid the tears and keep your costs down with these great tips!

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MANAGEMENT *strategies*

coaster car had just derailed and I was
plummeting to the ground.

Oh, OK... it wasn't as bad as all that. As
it turned out, I didn't plunge to my death.
The cause of the error message was a
problem with the server. This had never
happened during the development and test-
ing phases of the course. However, it just
so happened to occur on the very day of
the nationwide launch. The **good news** is
that the server was up and running by
1:00 that afternoon and 130 participants
registered for the course within the first
week.

Why keep reading?

This article is a must for anyone who
has thought about developing an e-Learn-
ing program in-house, is thinking about
doing so, or who is already in the planning
stages. Would you like to find out what
happens behind the scenes of e-Learning
program development, from Learning
Management Systems (LMS) and video
production, to promotion, marketing, and
calculating Return on Investment (ROI)?
As Kevin Moore and Greg Harmeyer wrote
in their April 23, 2002 article in **The
eLearning Developers' Journal**, "How to
Determine the Real Cost of e-Learning
Programs," *"Costing e-Learning is like peel-
ing an onion... there are many layers, they
don't ever seem to end, and sometimes it
really smells."*

By reading this article, and the sequel to
be published next week, you will learn how
at AIG Companies, Japan we designed,
developed, and implemented a 10- to 15-
hour language skills training program for
our employees. This blended learning appli-
cation, and its supporting LMS, were creat-
ed in-house.

In the course of this investigation, we
will examine three of the many layers of
the e-Learning onion and we will look in
detail at the steps we took in each. At the
end of the second article, I will review our
results and the lessons learned.

You will see how we learned from our
mistakes in 2002, and how we are plan-
ning to implement our 2003 online course
without all the tears (just the blood and
sweat). In this week's installment you will
learn how to protect yourself from the awful
odor of the e-Learning onion through the
use of Moore and Harmeyer's initial cost-
ing check sheets for the design and techni-
cal elements. These will help you avoid the

many tears that are usually associated with
implementing an e-Learning program. In the
long run, using the check sheets will lower
your production costs. Let's begin.

Layer 1 of the e-Learning onion: The design phase

We really should begin by reviewing the
background of AIG's 2002 e-Learning pro-
gram, the Online Telephoning Skills project.

When I was hired, about two and a half
years ago, one of my goals was to help AIG
meet their English-oriented needs with a
Web-based solution. My first job was to
design, implement and manage an e-Learn-
ing program to be provided by a vendor,
within the context of AIG Japan's already-
established International Communications
Program (ICP). With the vendor's help,
delivery system, and content, we produced
an interactive, immersive simulation, sup-
ported by both live and teleconference ori-
entation sessions and by online "e-Train-
ers." This ICP e-Learning business-English
language program was highly successful. It
resulted in improved English-language profi-
ciency test scores and raised employee
confidence in their business-English skills.
(*Editor's Note:* See "Making e-Learning
Work at AIG Japan: A Case Study" in **The
eLearning Developers Journal**, April 7,
2003 for the details of the author's 2001-
2002 project.)

After the ICP simulation's one-year online
pilot started, in February of 2002 I
approached my manager with an idea to
develop our own online training program *in-
house.* This is my true passion. I think the
challenge, creativity and sense of accom-
plishment that comes from seeing some-
thing you have created from scratch
become something that people use and
learn from is tremendously satisfying. That
is, it is satisfying until you get your first
email from a learner saying that they can't
see your page or there's no sound. That's
a whole set of new emotions that I will get
into at the end of next week's article.

AIG's 2002 e-Learning project business objectives

I think everyone has a little tech nerd
inside of them just waiting to get out. I
was eager to let mine loose because I
had a lot of exciting ideas waiting to be
realized about the next steps we could
take. Luckily for me my manager, Lisa
Sanders, had already been thinking along

the same lines and was very open to any ideas that I had.

Lisa was considering using the Web because she felt we needed a blended solution to train employees in AIG-specific material. By combining Web-based content with our current classroom-based language-skills training programs, we could enhance the learning experience and provide a lot more value and return on our investment. During the next two months, we also found that our Web-based solution could be used as an open-enrollment nationwide training program.

Meeting a need: Basic English Telephoning Skills workshop: The first step after getting the go-ahead was to look at our current classroom-based training programs and decide which ones would benefit most from a blended approach. We decided that out of all of our English business-skills training programs, Basic English Telephoning Skills was the best match. Every year, this workshop received the most applications for enrollment from employees. We felt we would be able to create an online program that would improve the effectiveness of our current workshop. Providing an online nationwide open enrollment was another important benefit: anyone in Japan with access to our intranet could improve his or her telephoning skills. This may seem a pretty simple way to approach our needs analysis, but this was our first online course, so we wanted to keep it simple and do something we knew deep down inside would add value to our program.

You may be asking yourself, "How difficult can it be to talk on the phone?" Well, have you tried to do it in a foreign language? It's pretty difficult. At AIG Japan there is a need for *English* telephoning skills training because AIG is a global company and English is the main language used worldwide for communication.

Design phase: Initial costing check sheet

The next step in the design phase, after doing a needs analysis, should be to use Moore and Harmeyer`s "Design Phase — Initial Costing Check Sheet" to plan the details of your e-Learning course. *The purpose of filling in this chart is to give you a rough idea of how expensive the development of your course is going to be.*

To be honest, I didn't do this when I was designing our 2002 course. Moore and Harmeyer's article was published after we began.

That being said, I *did* learn a lot when I finally saw the article in **The Journal**, and so I decided to complete this chart after the fact. This helped me see where I could make improvements in the development process for our 2003 program. Now I am able to save time by being better organized and prepared. The Design Phase — Initial Cost Check Sheet with my notes reflecting our experience in the 2002 e-Learning course design is shown in Sidebar 1, near the end of this article.

In order to better organize myself, my original check sheet contained very detailed notes about each of the activities. In this way, I knew exactly what needed to be done in every section. By doing this, the vision became much clearer to everyone on the team. When you use this check sheet for your own projects, add as much detail as you can in the beginning. You can always go back and delete things later.
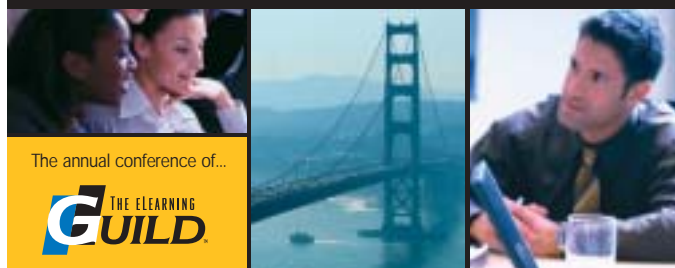
I have provided a number of my own questions in the sidebar. You will probably have many more of your own. I also added sections to the check sheet for planning alpha and beta testing and for final production.

(For further explanation of each variable in the left-hand column of the check sheet, please see Moore and Harmeyer's article.)

FIGURE 1 *Claudia Colnar, our SME, and the author, starring in our instructional e-Videos.*

Technical — Initial costing check sheet

In addition to using the Design Phase — Initial Costing Check Sheet to plan the details of your e-Learning course, you should complete the "Technical — Initial Costing Check Sheet" that also appears in Moore and Harmeyer's article. The purpose of this chart is to further refine your estimate of how expensive the development of your course is going to be.

Once again, I didn't do this when I was designing my 2002 course. One mistaken assumption I made when designing the course was that integrating a custom-made tracking system (LMS) with our course would be easy. I certainly learned my lesson! Just because you have a working knowledge of ASP, VBScript and Access, does not mean you can create an LMS complete with student progress reports on your own. You need a very strong knowledge of VBScript and SQL to get this working properly.

Once again, completing this check sheet after the fact was still useful, because I could apply the "lessons learned" to the development process for our 2003 program. Moore and Harmeyer's Technical — Initial Cost Check Sheet appears, with my notes, in Sidebar 2 on page 10.

Design model completion advice

Once you have completed the check sheets, you will have a very good idea of where you are going. When your team has reviewed your ideas, it is time to figure out how and when you are going to get there. To accomplish this, you will need to create a design model that lists tasks, deliverables, due dates and roles and responsibilities.

This is very different than the check sheets in the Sidebars. For example, before starting the development phase of your e-Learning program it is very important to know the answers to these specific questions:

- Who is responsible for content creation and when each lesson is due?
- When are you planning to shoot your videos?
- When is your studio reservation?
- Who is going to make the reservations?
- Who will be your talent?
- Who is going to do the taping?
- Who is going to do the video editing and video compression?
- When is the entire taping and editing going to be completed for the first lesson?
- Who is going to do the programming?
- When is each lesson due?
- Are you going to use a consultant?
- When are you going to contact him/her?
- When are the vocabulary Flash games due?
- Who is going to do it?
- Who is going to proof it?
- When is proofing due?

All of these questions (and possibly hundreds more) must be answered before you even think about entering the development phase. Always keep in mind who, what, where, when and how for all of the steps you need to complete in the development phase. Be organized. I am not going to give you my design model complete with due dates, deliverables and roles and responsibilities here because there simply isn't enough room. If you would like to see a good example of the level of detail I am talking about, please see my earlier article, referred to in the background discussion on page 2.

Layer 2 of the e-Learning onion: The development phase

Once you have finished designing your course and filling in the design and technical check sheets and creating your design model, it is time to move on to the second layer of the e-Learning onion — the development phase. What follows is the story of our 2002 e-Learning course development at AIG Japan. There are four main

parts to this story: prototype development, shooting your own video, using Active Server Pages and VBScript to deliver the course, and creating your own Learning Management System.

Prototype development

The development of our Online Telephoning Skills prototype was mostly done in my home office... oh, OK... it's not really an office. It is more like office/spare bedroom/storage space. When we first started the project we didn't have the hardware and software that could handle the video and audio that I planned to use, so I improvised and did everything at home. In my office/bedroom/storage space I designed our ICP brand image and shot most of the original prototype videos.

My colleague and Subject Matter Expert, Claudia Colnar, put the content into a Word document. I took that home and put it into the prototype course template using Flash, audio, video and graphics. At the same time Lisa Sanders, our program manager, was working very hard on getting us the budget for the proper software and equipment, so we could continue developing our Online Telephoning Course at the office and securing for us the use of our in-house video studio. We went from shooting low-quality home videos (with my laundry bin in the background!) to producing professional-quality e-Trainer instructional videos.

Completing the prototype at home made it possible to show Lisa what we were able to do and also what I really envisioned doing in the future. Lisa was then able to use the prototype to help secure the proper equipment and software to do the remaining lessons at the office. The process of creating the prototype required from March 2002 until August 2002.

A quick note about video production — and being prepared

We were very lucky in our video development because there were only two of us to act as director, talent, video production expert and online media specialist. Claudia Colnar, the SME, and I certainly wore a lot of hats in the development phase, especially regarding video production.

When we shot the video for our Online Classroom as we call it, we would take turns being talent and director (see Figure 1 on page 4). The director's job was to

FIGURE 2 *Mike Sorey, a fellow trainer, starring in one of our e-Video conversations filmed in our office.*

run the camera and lights and also act as the script holder. This means after the director said action, she would slowly move the script up behind the camera, so the talent could simply read from it. Because we held the script behind and just above the camera, it looked like we were looking into the camera and saying our lines from memory. Look out CNN! If you have never done video production before, it certainly is exhausting. Now I know why the big stars need assistants to bring them water and fruit. (We had to get our own coffee and corn soup from the vending machine.)

Sometimes we needed to be really creative with our video production because we had limited resources and time. For example, in the conversation section of each lesson, we needed to create a realistic conversation on the telephone between two people. In order to do this we simply asked for volunteers in our office to spend thirty minutes reading from a script to play the roles of caller and receiver in our e-Videos. This turned out to be very effective and realistic.

We would shoot the video of one of our co-workers on the phone at my desk from the side, so he or she could look straight ahead and read directly from the script that we pinned up on my cubicle wall in front of them (see Figure 2 above). Each volunteer would say all of their lines pausing in between each of them. After both volunteers completed their lines, I would take the video that I captured directly on my PC

with our digital camera and quickly edit the video clips together, so the final product looked like they were actually talking to each other. This whole process of shooting and editing a ninety-second conversation took about 2 to 3 hours. We became very efficient in our video and audio creation.

If you are getting into video production, you need to be really organized and prepared by creating a design model before getting started. You will also need a digital video camera that you can connect to your PC during video shoots (Sony and Canon are both very good brands).

By capturing the video directly onto your PC you will save a lot of time. If you shoot the video first just using your video camera and then transfer the video to the PC later, you will be wasting a lot time waiting for the data to be recorded onto your PC. This way kills two birds with one stone. Remember, you have limited time, so you need to do everything you can to save it.

To do this you will need a good PC with lots of RAM and a fast processor. Our Sony VAIO Laptop has 512 MB of RAM and a 2.4 GHz processor. We haven't had any problems. You will also need a Firewire or iLink cable to connect your digital camera to your PC.

Finally, you will need good video editing software like Vegas Video 4.0. This software allows you to capture and edit video and audio and exports the final product as Window Media files or the compression format of your choice. For more information

about video editing, please see "Repurposing Taped Video for e-Learning Part I and II: From Tape to Hard Drive" by Stephen Haskin in **The eLearning Developers' Journal**, March 3, 2003 and March 10, 2003.

Development with Active Server Pages and VBScript

Every year my wife, Masayo, and I travel back to Oshawa, my hometown just outside Toronto for our summer vacation. Last year, I decided to combine my trip with some technical training at XtraNet

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(www.xnu.com). For 5 days in August I studied how to use Macromedia Ultra Dev and how to make Active Server Pages. After studying and learning about VBScript and how to make dynamic web pages, I applied what I had learned to my online project. We had already completed about 70% of the content by this point and I had put most of it into HTML pages. When I returned to Tokyo, my first job was to convert all of my HTML pages into Active Server Pages. which was quite easy but hardly even the beginning of the story. The next step was to learn how to use VBScript and forms to pass participants' quiz answers to an answer page and give them a score in the form of a percentage. We also needed to figure out how to create a "custom-made" LMS.

Making Quizzes. Thanks to Robert Ross, one of the excellent trainers at XtraNet, and www.15seconds.com, I was able to figure out how to do this.

Note: If you have never heard of 15seconds.com, then I highly recommend you check it out, if you have questions or problems with your Active Server Pages, SQL or databases. It is an excellent resource. Simply register, login, post your question and wait for your answer. It doesn't get any better than that. Oh yes... they don't give you the answer outright — they try to teach you how to do it by pointing you in the right direction and having you try to figure it out on your own.

There were two key issues that had to be resolved during all this quiz development: Fill-in-the-blank quizzes, and what to do if there is more than one correct answer.

Fill-in-the-blank quizzes. When you create a quiz in Macromedia Dreamweaver, you will be using a form that passes the learners' answers to either the same page or a separate answer page. I found it easier to pass the answers to a separate answer page. (For more information on how to do this please go to: http://www.macromedia.com/macromedia/accessibility/mx/dw/forms.html).

The VBScript code that Rob and 15seconds.com helped me develop does three really cool things. It tells your application to:

1) Ignore spaces in the students' answer and to change their answer into lower case letters, which means their answers can contain capitals or small let-

ters. This was a real problem when we were testing the prototype. Many participants complained that they had answered the question correctly, but the system marked it incorrect.

2) Calculate how many questions the learner got correct and what their percentage is.

3) Display the word "Correct" if the student typed in the correct answer or display the phrase "Incorrect: the correct answer is ..." if the answer was incorrect.

More than one correct answer. Once I had written the code, I was able to modify it so the system could accept multiple answers. This was another complaint we received from the participants and trainers during the testing phase. In English there are many ways to say the same thing. VBScript allowed me write code that accepted more than one answer to a question.

Custom-made LMS: TrainTracker 2000

TrainTracker2000 is the name I gave our custom-made Learning Management System (The name's not that bad... I had to name it something, didn't I?) This includes the Access database, site infrastructure and report pages. Keep reading to learn how I created this, one layer at a time.

Access Database Design: Just being able to give students a quiz score was great but it wasn't nearly enough. The next step was to design a database that could track their scores in a table that identified whose score it was and what lesson it came from. I also needed to know what quiz it came from. Was it a listening quiz score or conversation quiz score? This was the level of detail I needed. Before I even touched the Access icon on my PC, I spent a lot of time planning what I wanted my final report pages to look like, so I sat down and put my rough ideas on paper.

Individual Reports Page. I wanted to track 1) total time spent per lesson and 2) all quiz scores. I wanted all of this information to be displayed in a neat and tidy table, with the student's name, company, contact information and manager's name displayed just above the table.

I also wanted an employee selection page to come before the report page, where the course administrator and man-

agers could see everyone who registered for the course and select the employee that they wanted to see a detailed progress report for. This page would only contain the information that the student would enter on the registration page. There wouldn't be any course progress details.

All of this sounded pretty straightforward at the time. As it turned out this was much

more difficult than I had originally thought. However, I know now that I simply needed to be better prepared in the Design phase.

Finishing the application design and development

After planning TrainTracker's report page and the employee selection page on a piece of scrap paper, I was able to start

SIDEBAR 1 *Design — Initial costing check sheet*

Program name: _____

Check one: ___ Blended program   ___ Stand-alone online program

VARIABLE	NOTES
Overall course objectives	• What are the goals of your online training program? **1) Blended:** • How will success be determined for the online portion of your blended training? For example, is there a required minimum score on a quiz or final assessment? • How will success be determined for the classroom-based portion? **2) Online stand-alone:** • How will success be determined for the online training? For example, is there a required minimum quiz or final assessment score?
Approximate course length	• How long is the online portion of the training? • How long is the classroom-based portion of the training? **The longer the program, generally, the more it is going to cost to develop.**
Interface: standard or custom?	• Is the interface you are planning to use custom-made or are you using an existing one? If you use a custom interface, more time is needed for its development. **Custom interfaces tend to mean higher costs to design**.
Course navigation	• How is the course going to be organized? • Can learners simply do any section of the lesson they want to do or do they have to do assignments in a certain order? • Are you using customized navigation buttons? Where are they located? • Are you using frames? • Do students always have access to a course outline page where they can find what they need to study, rather than doing the whole course? • Can students use the Internet Explorer or Netscape Navigator "back arrow" buttons? If so, how is their data tracked? If not, what happens if they try to use the buttons? • Are you using an off-the-shelf LMS or a custom-made tracking system? How is data tracked?
Graphics	• Is your course highly interactive with activities on every page in every section of every lesson? • How many lessons are there? How many sections of each lesson contain activities? How many are text only? How many sections contain some kind of multimedia like video, audio and animation? • What kind of activities are they? Flash? Branching video? Fill-in the blanks? Multiple-choice questions? • What happens if the student makes a mistake? Do they receive hints and are they able to try again? • What is being tracked in the database: Time spent per page? Quiz scores? • Are you using any special technologies like recording students' voices or voice recognition software? • Is your course text-based with few activities? **The more interactivity there is in your course, the longer it will take to develop and the higher your production costs.**
Video	• Are your graphics custom-made? Are they stock graphics provided by your client or your company? Are you using a CD or internet site for your photos and graphics? **If you need to buy graphics from another company, then your costs will be higher.** • Are you using video? • What is the purpose of the video? Why are you using it? • Does the video add value to the learning experience or would audio be more effective? You really need to consider your end-users' bandwidth issues. • How long is each video? • What video compression format are you using? Real Media, Window Media Video, QuickTime? • How are you using video? Are you doing branching video simulations? • What plug-ins do your end-users need to view your videos? • How many lessons contain video? How many sections of each lesson contain video? • Where are you going to tape the videos? How quickly can you get your video taped, edited and ready for the net? • Are your using already existing videos? If so, how are you going to get them into digital format? • Do you have a digital camera, Firewire cable and a computer powerful enough to handle video capture and editing? **The more video you use, the higher your production costs.** **The higher the quality of talent and sets you use, the higher your costs**. **Using existing digital video is probably the cheapest way to add video to your program.**

SIDEBAR 1 *Design — Initial costing check sheet* (continued)	
VARIABLE	**NOTES**
Audio	• Is audio required? Where are you going to use it? Why are you using it? • Are you using audio with animation as a voiceover? • How long is each audio segment? • What video compression format are you using? Real Media, Window Media Audio, QuickTime? • How many lessons and sections of your course need audio? • Where are you going to record your audio? • What audio editor are you going to use? • Who is going to do the audio work? **The more audio you need, the higher your production costs.** **The higher the quality voiceover talent you use, the higher your costs.** **Doing the audio yourself is probably the cheapest way to add audio to your program.**
Simulations	• Are you going to use simulations? If so, why are you using them and more importantly, how are you going to use them? • Are you doing a video simulation or a Flash simulation? **The more complex your simulation, the higher your production costs.**
Assessment	• Are students required to do a pre-course assessment? Post-course assessment? If so, what do they need to do to successfully pass the course? • Are students required to do a pre-lesson assessment? Post-lesson assessment? If so, what do they need to do to successfully pass the course? • Are students required to do section quizzes? If so, what do they need to do to successfully pass the course? • What kind of assessment are you conducting? Simulations? Fill-in the blank? Multiple-choice? Flash? • How many times can the learner take the assessment? Do the questions change each time they take the assessment? • Are the assessment scores tracked and visible on a report page? **The more complex your assessments and the greater the number you have, the higher the production costs.**
Content status	• Is all of the content in the SME's head? How much time will it take to put it into electronic format? **If the content is in the SME's head, then it will take a lot more time to get it into digital form. This will result in higher production costs.**
Subject matter expert	• Who is the SME?
Review cycles	Step 1: Create and review Storyboards. Are your Storyboards in HTML or PowerPoint or Word? Step 2: Alpha version or Prototype Step 3: Beta version or updated Prototype Step 4: Final **The review cycles take a lot of time but are crucial to the success of your program.**
Alpha version	• Who is going to test and review your alpha version? • How are you going to get volunteers to do this? • How are you going to receive their feedback? • Are you going to hold an orientation? • How many people are going to have to review your alpha version? • Are you going to give them specific things to look for while using the alpha version? • What criteria are you going to use for selecting your sample test group?
Beta version	• After making changes based on feedback from the sample group, are you going to have the same sample group review your Beta version or are you going to use a new group?
Final version	• Who is going to do the testing of the final version? • Who is going to make corrections and do the re-testing? • Who is going to make the final decision that everything is OK to move on to the next lesson development?

SIDEBAR 2 *Technical — Initial costing check sheet*

Program name: _____   Check one: ___ Blended program   ___ Stand-alone online program

VARIABLE	NOTES
CD and/or Web	• Are you designing for the internet, for a company intranet or both? Are you using more than one delivery method (e.g., are you also designing for CD delivery)? • If you are planning on using the company intranet, you should contact your technology services department to find out what bandwidth issues you are facing. • If you are designing for a CD, you should be thinking about how you are planning to distribute them and how you are planning to track learner progress. • If you are designing for the internet, you should be finding out what percentage of your end-users have broadband connections or are still using dial up? This will seriously affect your design choices. • If you are planning to use the internet, what kind of security are you planning on using? How do learners register for the program? **Designing for multiple delivery methods may lead to higher production and distribution costs.**
Platforms to support	• What is the standard platform for your end-users? • This is much easier to find out if you are using the company intranet. Usually the technology services department at your company will be able to tell what version of Internet Explorer or Netscape Navigator your end-users are using. • If you are planning on using the internet, you really need to develop your content for a much wider audience. **This may mean you need to do a lot of testing on a number of environments. This could also lead to higher production costs.**
Screen resolution	• Standard desktop screen resolution is 800x600.
Video Integration	• See Sidebar 1 for details.
Audio Integration	• See Sidebar 1 for details.
Simulations	• See Sidebar 1 for details.
Plug-ins	• Here is a list of the standard plug-ins: 1. Flash 4.0, 5.0 and 6.0 2. Windows Media Player 6.4, 7.0, 8.0 and now 9.0 3. Adobe Acrobat 4. Real Media Player 5. QuickTime Player **Intranet:** You need to pay attention to the version your end-users have on their computer because if you use Flash 6 for your content, and your company standard is only Flash 5 and your user doesn't have access to the internet, then the end-user will not be able to view your content. Talk to your technology services department before beginning any project and find out.
Hardware restrictions	• Are the end-users' computers Intel-based? • How much memory (RAM) do their computers have? • What is their processor speed? • Are they using Windows 95, 98, 2000, ME, or XP? • Are they Mac users? Which OS?
LMS integration	• Are you using an off-the-shelf Learning Management System? How much support is needed from the LMS vendor? Is this an extra cost? How and why are you using an off-the-shelf LMS? What are the benefits over building your own? • Are you building your own LMS? Is a consultant needed for the design? How and why are you building it yourself? What are the benefits over using an off-the-shelf LMS? • How is data going to captured and inserted into the database? • How is learner progress going to be reported? • How are learners going to register for the course? • What kind of database are you going to use? Access? SQL? **You really need to look into the costs of buying an off-shelf LMS versus developing your own in-house.**
Database access	• Are you going to use Access or SQL? Who is going to design the database? Who is going to maintain the database?
Web server	• You will need to find out the following from your technology department: 1. Web server software 2. Operating system software 3. Encryption software **If you need to purchase encryption software to protect your data, this needs to be added to your production costs.**
Online Help	• Will there be a need for online help? If so, why is it needed and who is going to provide it? How will it be provided? **Even more costs.**
Site maintenance	• Who is going to maintain the course? **Again more costs that you may not have thought about.**

planning the database by November 2002. It seemed pretty straightforward to me: simply create a relational database for all of the student and course information. Because my database skills were still in their infancy I enlisted the help of a database expert. After a couple of emails back and forth explaining what I wanted to do, he agreed to meet with me and to point me in the right direction. After a few days and a lot more email, we finalized the design and structure of the database for TrainTracker2000.

TrainTracker 2000: VBScript, SQL, and intermediary pages

I wanted a database that could be used not only for the 2002 course, but could also be used in the future when we added new courses, so the database needed to be flexible and to support adding new courses with little difficulty. The key was to use VBScript, SQL and intermediary pages to collect data. The TrainTracker2000 database looks good now, but it took a bit of work to get the data into tables correctly, and I couldn't have done it alone. Here's what it took.

Getting consulting help. It was December 1, 2002 and our classroom-based telephoning kick-off workshop was only ten days away. At that time we were planning to assign the ten online lessons as pre-workshop homework. The classroom-based telephoning skills workshop was scheduled for January 10, by which time the participants needed to have completed all 10 online lessons. By now all of the content was completed and students could study, but we still couldn't track their progress. This little technicality would engulf my life for that entire month. At this point I had the database finished, but no data and no way to get data into the database.

I realized I needed help at this point, so I contacted my trainer, Rob, from XtraNet in Canada and asked him if he knew anyone who was available to work as a consultant.

After a few days Rob introduced me to Glenn Price-Jones of Medrus Information Solutions. We worked out an arrangement and he agreed to take the job. By now it was December 14 and our telephone workshop students were already studying online. There was also discussion about rolling out the online standalone version of the workshop nationwide in January. The pressure was on!

After a number of emails back and forth, and two conference calls to Canada between eggnog and Christmas turkey, Glenn came through. By January 5, 2003, we were able to get the student data from the web pages into the database and then back out into neat and tidy report pages. After hearing what I wanted and looking at the database, Glenn suggested we use intermediary pages between all the Active Server Pages to capture the data we needed and input into the database. The user does not see the intermediary page. The purpose of the intermediary page is to collect learner data and insert it into the database and then redirect the learner to the next page all in a blink of an eye. This is done through code on the intermediary page itself.

Report pages. As I stated earlier, before I even looked at my Access database I wrote down on a piece of scrap paper exactly what I wanted my report pages to look like. From there I designed my database and worked with Glenn to design the report pages. The code in the report pages is much more complex than the code that collects the data, and I won't go into detail about either set of code here.

Employee selection page. The employee selection page allows you to see how many people have registered for your course, sorted alphabetically or even by date of registration. It also allows you to see each employees' identifying information, such as employee number, manager's name, location, etc. I also added a drop-down menu for faster employee selection. After selecting an employee on this page, you can go to their individual progress report page. The employee selection page was quite simple to create because Macromedia Dreamweaver UltraDev provides easy-to-follow tutorials.

Individual progress report page. After selecting an employee's name on the employee selection page, you will come to that employee's individual progress report page. Glenn and I used VBScript and SQL to create this page and once we got it working, it really looked after itself. It displays total time the learner spends per lesson and the lesson section quiz scores. It is very simple, but it is all I need to make my reports to my manager and it is all the learners need to track their progress. This is the final product of TrainTracker2000.

Every time the learner logs on to the site, the application tracks their progress. Whenever I want to see a student's progress, I simply go to the employee selection page and choose a learner. TrainTracker2000 automatically updates their data. Managers can follow an employee's progress anytime they want. Since January, I have been designing new report pages to meet the increasing number of requests by management. When TrainTracker2000 was completed, I felt a huge sense of relief and accomplishment.

Summary

In summary you can make the e-Learning onion smell a lot better by:
- spending more time in the design phase (Layer 1); and
- being better prepared and organized, so you can save time and lower your production costs.

Next week I'll give you a look at how we handled Layer 3 (Implementation) of the e-Learning Onion. I'll also describe costing, evaluation, and some substantial issues we encountered with this project, issues that other development teams, maybe even your own, must deal with in every project.

Resources

I have no financial relationship with any of the companies or web sites listed below. These were invaluable to me and to our team as we developed our 2002 project.

VBScript

If you want to learn more about VBScript please go to:
http://www.intranetjournal.com/corner/wrox/progref/vbt/
http://www.w3schools.com/vbscript/default.asp
http://www.15seconds.com

SQL

If you want to learn more about SQL please go to:
http://www.w3schools.com/sql/default.asp
http://www.sqlcourse.com/.
http://www.15seconds.com

Consultant

We received a great deal of assistance from Glenn Price-Jones at gpricejones@medrus-ca.com.

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Russell McNally has been designing Web-based training solutions for corporations in Japan since 1997 and has been a corporate trainer for the past seven years. He has conducted training for such companies as Citibank, Motorola, Eli Lilly and GlaxoSmithKline. In 1999, Russ partly owned an Internet-based corporate training provider that specialized in business-English training for corporate customers in Japan. He was responsible for the design, development, implementation and management of the online business training that leveraged the latest web technologies and design principles. Russ is currently working for AIG KK in Japan where he is in charge of designing, developing and managing their in-house online English language training program which produces engaging web-based solutions that include audio, video, and Flash content in an ASP environment. Russ has published a number of papers on language acquisition and most recently published an article called "Making e-Learning Work at AIG Japan: A Case Study" in **The eLearning Developers' Journal**. Russ holds a Masters Degree in Education from Temple University, Japan. Contact Russell McNally at mcnally@aig.co.jp.

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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.