Discussion: The Advantages of onViz

What problems does it solve?

In the past, when people have tried to create meaningful multimedia or computer-based learning programs, many found it took far too long to prepare and contained almost as much reading material as a printed book. onViz reduces the amount of time and complexity required to create courseware and multimedia.

- **Reduced Complexity**. Creating interactive tutorials, demos, and simulations is not a simple process that can be routinely performed by general users. It requires the specialized training and skills of professionals like programmers and designers. Such development is much more difficult for organizations that have neither the facilities nor the financial resources to support the required professionals.
- **Less Expensive Programming**. The programming involved in application building is costly. Programmers are among the most expensive professionals in the high-tech field. In addition to the substantial expense, programming is extremely time consuming. For many organizations, the high cost and complexity of programming are strong deterrents to establishing in-house development capabilities.
- **Productivity Improvement.** Because of the programming and graphic design required, creating any type of interactive multimedia often absorbs a significant period of time and resources. In today's high-tech environment in which technologies change extremely fast, applications created over longer periods may be outdated or obsolete before they are even completed. Rapid, flexible production cycles have become essential.
- **Versatile delivery options.** Applications created using onViz run identically on Windows 95//98/ME/NT/2000/XP or Apple Macintosh computers. These can be deployed in many ways, including the Internet, Intranets, peer-to-peer networks, CD-ROM, DVD-ROM, and floppy disk.

Why do we need yet another application for presenting graphics, text, sound, movies, animations (ie. multimedia) from a disk or CD? When we want to present multimedia from the web (and in fact from a hard drive or CD as well), we can use any number of web authoring applications

Sure, there are many applications out there that one can use to present multimedia from the web as well as CD-ROM, etc.

Maricopa's Authoring web at http://www.mcli.dist.maricopa.edu/authoring/ (perhaps the most up to date, non-biased source on the Internet) lists around 940 multimedia-authoring programs. Many tools only support authoring on MS-Windows computers - narrow this list by searching for Macintosh supported authoring tools and the total number drops to 31 - and most of these are for creating presentations only, no support for asking questions and evaluating responses. Narrow it down further to the ones that offer the features of onViz, and the number drops to 12, and of these, not one compares in terms of price/performance/features. CourseBuilder was one of the first authoring languages to feature visual authoring, and established that paradigm – over 15 years ago.

onViz has significant value as a multimedia and courseware authoring tool because it has been carefully designed for ease of use, reliability, and cost effectiveness. There may be other authoring tools that offer more advanced features, but at a much higher cost.

The Web and browser have become the de facto medium and interface for delivery. It seems there is no longer a need for platform-specific authoring when I can develop web pages in HTML for delivery of courses via the web

Web browsers, along with the Web are works in progress. To develop an HTML document, you still have to understand several programming languages such as Javascript and HTML, as well as hardware issues relating to delivery of your content.

For example, digital video streaming and its effect on your Web server as its accessed by tens, hundreds, or even thousands of users. What is the network bandwidth of your target audience? Will your application run equally as well on Apple Macintosh computers using OS 7x/8x/9x/10, as well as those using Microsoft Windows 95/98/NT/ME/2000/XP? Then there are the security issues…

onViz is designed to supplement web-based tools and provide another choice for how you want to communicate.

Why adopt a PC-based program to author courseware and multimedia when there are already products that allow this to be accomplished using the Web?

onViz is but one component of distance learning, which may also use Web-based materials, asynchronous threaded-web discussions, or high bandwidth interactive video conferencing (IVC) over a network.

Key features such as versatility, customizability, cost, variety of tools, cross-platform accessibility, available content, speed, the ability to integrate multimedia using alternate drives (such as CD-ROM), ease of support, organizational /designer/faculty/student ease of use are key factors, along with ease of authoring.

Many learners do not have 2 telephone lines going into their homes, which means if you are using a Web-based system, learners will be required to tie up their primary residential telephone line during the entire duration of their "connection" to the online course. This can put a damper on the amount of their interaction and engagement, particularly if they have the confounding problem of unreliable or no local Internet access.

Web-based courses can also be problematic for faculty members if they do not have 2 phone lines. Plain and simply, if a course is Web-based and there is an expectation of daily involvement with the course, it's considerably more desirable to be able to offer alternatives including supplemental CD-ROM/DVD access for working offline.

Why are your products better than web-based standards such as java, XML, or HTML?

At this point in the Web's evolution our products work dependably. Anyone who develops websites can attest to the frustration of simply trying to get a web page to look the same on all of the different Web browsers and computer operating systems out there. With streaming video one must deal with a variety of competing formats and the challenge of delivering it over low-bandwidth connections as well. Add these issues together if you are an organization with limited funds, and the price tag might shock you.

DSI is working towards integrating web-based technologies such as java and XML with our products for the future. At this time both CourseBuilder and onViz are intended as interim solutions until the myriad problems associated with pure web-connectivity are worked out, and to provide Web independent alternatives for those who need them. The hype associated with

all things Internet has led to a string of disappointments and outright failures. On the Internet, there is an amazing amount of complexity required to make everything work together. Servers must be properly configured, authors must ensure their creations will work over low-speed connections, and competing ‘standards’ will make your head spin.

Extensive testing must take place to discern each and every one of these limitations to uncover unforeseen flaws in implementation, and this adds substantially to development costs.

Using onViz shifts the computing burden away from a particular server to the user’s PC, saving network bandwidth and costs while decreasing deployment complexity.

What’s a realistic way to determine the cost of production and integration for e-learning courseware?

Rather than use static, one-way approach, e-learning technology should strive to create a community of learners who work together over distributed networks. One way onViz can facilitate this is

- Server load is diminished because users download content to their computer rather than receive it through a web browser.
- Enables users to interact with a browser-based chat board while their course window is open as a separate document.
- Enables multiple users to download small chunks of information pertaining to their curriculum simultaneously.

Buying and configuring Net-based e-learning systems, as well as filling them with good, effective courseware that consolidates older material, is no small undertaking. In this tight economy, businesses cannot make such an overhaul a priority, especially because there may not be a perceived need for e-learning or an understanding of its potential.

Not everyone is receptive to e-learning courses, especially if they must be taken during an individual’s free time. And because the concept of e-learning is so new, educators who can develop good, effective commercial courseware for the masses are scarce.

People were very excited about e-learning as recently as the beginning of 2001, talking about it as a way to keep their people up to speed, well versed and articulate, without taking them off the job. But in just a few months interest completely dropped off.
E-learning quickly moved to the back of decision-maker’s minds, because companies do not want to make the investment in the required infrastructure, and are skittish about new initiatives.

Brandon Hall (2000) reports that the "costs of learning management system solutions are rising dramatically and that new 'per-user, per-month' pricing models appear to be the cause. In addition, 86% of LMS vendors are actively promoting their systems as application service providers."

The bottom line is, many existing e-learning systems are very expensive to implement. When determining cost, consider additional network deployment costs for ongoing security, bandwidth, maintenance, and support. Then compare those costs with deploying the same thing on CD-ROM to individuals already familiar with their respective computers.

Web-based learning courses are delivered using a browser. These courses will run on practically any computer without cost.

At this time you can deploy onViz-developed courses on the web, however they must be downloaded and execute on each individual's machine. While this may seem an inconvenience for learners with slow modem connections, there are additional factors to consider:

- When using any browser, one must download everything displayed by that browser anyway
- Browsers are free and are supposed to be broadly compatible. In fact there are many differences between brands and versions. Web browser inconsistencies make authoring content for consistent display difficult and time-consuming. Because onViz doesn't require a browser to display information, authoring for consistent display of your information is enormously easier, and HTML coding is unnecessary
- When onViz is run on the learner's machine, it runs just like any other multimedia application, and can be used to open a browser window for online research, chat, or e-mail, or any other application or document on a user's computer
- Using applications based on individual computers significantly reduces server load and the accompanying expense of adding servers or expanding network capabilities
- Browser-based learning systems are heavily dependent on Web connectivity to function
- The following table illustrates some of the technical issues required for delivery of web-based learning courses and multimedia:

Bandwidth hogs
Some Web-based learning solutions can eat bandwidth. The following table illustrates the average amount of bandwidth required on a network per concurrent client for each conferencing option.

Conferencing Options	**Average network bandwidth**
Data only	22 Kbps *per student*
Unicast audio conferencing and data	28 Kbps *per student* (22 data + 6 audio)
Multicast audio conferencing and data	12 Kbps per class for audio and 16 Kbps *per student* for data
Indeo Multicast video conferencing and data	340 Kbps per class for video and 16 Kbps *per student* for data
H. 323 Multicast Video	172 Kbps per class for video and 16 Kbps *per student* for data
Unicast streaming video and data	37 Kbps *per student* (22 data + 15 streaming video)
Multicast streaming video and data	15 per class for streaming video and 22 Kbps *per student* for data

Source: InfoWorld, July 21, 2000

Is onViz a Learning Management System?

Not at this time. However, onViz contains many features found in Learning Management Systems (LMS):

- Can create user reports, even report cards that use the data from onViz-generated reports.
- Centralized repository of data
- Shared and reusable content sources
- Shareable content resources that can initialize other programs or documents, thus providing a one-way link. If the document being linked to has the same capabilities, then a basic level of interoperability can be achieved

The purpose of a LMS is to simplify the administration of learning/training programs within an organization. For learners, it helps them to follow and plan their learning progress, and to communicate and collaborate with their peers. For administrators, it helps them to target, deliver, track, analyze, and report on the progress of learning programs within an organization. Most LMSs don't have the ability to create instructional content, and that is why most LMS vendors either provide additional content creation tools, or collaborate with content providers to provide complete solutions.

Learning content management systems (LCMS) are an emerging product category focused on controlling and organizing the workflows and resources of content management as well as personalizing delivery. They attempt to fill the gap between authoring tools and LMS functionality with a sophisticated structure.

A LCMS combines the administrative and management capabilities of a traditional LMS with the content creation and personalized assembly capabilities of a Course Management System (CMS). .

DSI is presently working on adding features to onViz that will render it an LCMS with:

- Support for emerging industry standards, such as IMS (Instructional Management System) and ADL's SCORM (Sharable Courseware Object Reference Model).
  The ability to support and manage internally and externally (third party) created learning content preserves the investment companies are making in learning content. Standardization is the best way to achieve this, and therefore is DSI’s top priority for future product improvements.
- Fully shareable and reusable content resources, compliant with the Advanced Distributed Learning (ADL) initiative
- Reusable Learning Objects that are recognized by, and interoperate with learning objects created using other authoring systems
- Collaborative features, such as management of publishing workflow through which content is reviewed, accepted and released for general access and consumption

Meanwhile, an external Learning Management System can be used to import onViz-generated report data as a text file into a database.

What about onViz being a closed, proprietary system? It seems this will restrict users efforts to scale future creations and provide interoperability with other existing systems.

Some pundits argue that standards will ultimately make the selection of a learning environment easier, as organizations will no longer have to worry about compatibility with existing courseware. But while standards are becoming increasingly important and more and more vendors are integrating support for them into their products, this does not mean that all products that claim to be standards compliant will necessarily be compatible with existing or third party courseware or that they will enable export of content for use with other systems. Clark Aldrich, former consultant with the Gartner Group states, "The standards today don't work. . . . A lot of companies say, 'We will dedicate ourselves to open standards.' But you can't find any vendors that adhere to these standards"

Behind all the talk about standards lies a single problem: the fact that it's difficult, if not impossible, to transfer content and test results between today's proprietary learning management systems.

Because content production is the most costly part of most e-learning and multimedia projects, the last thing anyone wants to do is rebuild old content simply to satisfy conversion to another proprietary system. That's why we designed onViz to provide you with two options when authoring:

- Keep your media assets external to the applications you develop. During authoring, onViz by default stores your media within an external folder where they can also be simultaneously accessed by other applications
- Include them within a single executable, to provide control over your media when it's distributed over commercial mediums such as the Internet or CD-ROM. Once your video, pictures, sound and text are included with an executable, they cannot be removed from it. This prevents plagarism.

Some contend there is the need for interoperability, not standards. onViz allows you to create "bridges" to other documents and applications on both the Macintosh and Windows platforms – including servers based on those platforms. If another course authoring system being used also has the ability to launch executable applications and documents, then there is already the capability for interoperability, however data cannot be concurrently shared at this time.

We are also working toward compliance with emerging industry standards like the ADL initiative's Shareable Courseware Object Reference Model (SCORM), so the interactivity of your multimedia application will be preserved as well.

According to ADL's SCORM version 1.0, the elements of Web-based training courseware are:

- **Course Structure Format:** an extensible markup language (XML) used to define the course elements, structure, and external references necessary to move a course from one LMS environment to another. However there are a number of proprietary LMS that don't all do the same things, and they perform these "standard" functions differently.
- **Run Time Environment:** a specific launch protocol to initiate executable Web-based content, a common content-to-LMS application program interface (API), and a data model defining the data that's exchanged between an LMS environment and executable content at run time.
- **Metadata:** recommended usage of IEEE LTSC Metadata elements for:
- **Course Metadata**: external metadata that describes a course package for the purposes of searching within a courseware repository, and to provide descriptive information about the course.

- **Content Metadata:** metadata that can be applied to Web-based content "chunks" that provides descriptive information about the content, independent of a particular course.
- **Raw Media Metadata**: metadata that can be applied to so-called raw media assets—such as illustrations, documents, or media streams— that provides descriptive information about the raw media, independent of courseware content.

The need for integrative solutions that provide the flexibility of object technology, adopt metadata standards that allow tracking, management, and deployment by a variety of enterprise management systems is not lost on us.

Presently, onViz is a transitional product – it is designed to help overcome the limitations of e-learning and multimedia delivered over slow Internet connections, differences in the way browsers display information, and a host of other current technical issues that make the deployment of multimedia a difficult, time-consuming, and expensive task.

Over the coming years, DSI products will evolve to embrace industry standards for interoperability, while maintaining a high degree of flexibility.

Why is using onViz to create multimedia better than traditional methods of teaching?

Realizing that everyone learns in different ways, we see onViz and CourseBuilder as products to supplement face-to-face interaction. It is simply another tool in the educator and trainer's arsenal of tools intended to make their job easier. These products are especially useful for people who are inclined towards visualization to facilitate the learning process. No computer program can solve everyone's problems – that's why we call these products tools, not the only solution.

According to the book, *Technology Assessment in Education and Training,* studies have shown that technology-based instruction may significantly reduce the costs of achieving instructional objectives by 30 to 60 percent. A 1994 study by J.A. Kulik found that compute based training versus traditional instruction averages a 30 percent reduction in the time necessary for acquiring a skill, and a 2 to 3 percent reduction in overhead.

Software application simulation has proven very cost effective. The operational costs for simulation are, on average, 10 percent of the costs of using an actual system to train. These studies also indicate that technology-based instruction either reduces time to achieve instructional objectives, or it increases learner skills and knowledge, depending on whether achievement or time is held constant. This can result in tremendous cost savings for worker training.

Early research indicates that successful incorporation of small group collaborative learning activities both increases the learner's satisfaction with the learning process (especially as compared to directed learning) and can decrease the time required from an instructor in administering and structuring a course or program.

Can you give me a couple of reasons why I should use this product instead of regular materials -- you know, books, pencils, teachers?

First of all, onViz is not designed to replace people – it's designed to make their jobs easier. In our view, people are not expendable. And it's not designed to replace books or pencils either. This product is intended as a tool to enable people in harnessing the power of computers to supplement existing methods of distributing knowledge.

Computers are an excellent medium to convey ideas by tying together sound, video, text, and pictures into an interactive format that enriches the process of knowledge exploration and discovery. These are things no other single medium does as well.

Software in general is notorious for being far from perfect. This product puts its users in the drivers seat and enables them to create software that works the way they want it to, with the flexibility to expand their vision later on if they choose. People can concentrate on their ideas rather than the process of communicating them. In this way, onViz really is like a digital pencil – one that never needs sharpening.

Why should I use your product instead of a competitor's?

Ask learners, vendors or Wall Street about the advantages of e-learning and they'll give you the stock answer: "It's more convenient, more flexible and more efficient than traditional classroom training". But ask an instructor about teaching online and you'll probably get the opposite response.

This is because many tools are difficult to implement and require authors to spend unexpectedly large amounts of time developing their curriculum for web-based delivery. There is also significant cost and staff required to implement and maintain the supporting infrastructure, and to coordinate everything.

Any method of online teaching requires instructors to spend more time creating and researching a course, and often more time delivering it. The same holds true for multimedia communication in general.

Many software vendors overstate the usability of their products. And some of these authoring tools require a programmer's understanding of code syntax. Although there may be a GUI (Graphical User Interface), often it's more of an aid to the programmer than the end user.

Content experts may not be the people best suited to use may of these programs. At the very least, a team approach is needed. In Macromedia's Authorware product for example, a newbie might take 8 hours to do what a company-sponsored presenter can do in an hour and a half.

To help make software technology usable for everyone, several things are needed:

- The ability to deploy mass-customizable applications
- Easy access to the technology
- Stability AND simplicity
- Minimal operating system requirements and restrictions

DSI's onViz product has been carefully designed to maximize ease of use by using a visual authoring paradigm. We realize many busy people do not have the time or resources to develop their own applications from scratch, that's why we offer a template development service, where we create a customized program "front end" that can easily be modified by customers to suit their specific needs.

Why are your products better than web-based authoring of multimedia and e-learning applications?

Remember that web-delivered e-learning and multimedia is still young, and so is web-based authoring. There are multitudes of companies clamoring for attention and to convince potential users how wonderful this medium is. The promise of being able to access information anywhere, anytime, anyplace is certainly an attractive proposition. But there are many technical hurdles that remain. The current economic slowdown, together with the dot-com meltdown, has put the brakes on the 'bandwidth buildout,' and there are still many web users out there with 56k connections and below - still much too slow to make streaming of large video, multimedia, and graphics files over the web tolerable.

Streaming media technology is in its infancy and there are many emerging standards. Web servers trying to deliver content to hundreds or thousands of users simultaneously are still brought to their knees. There are remedies to this problem but the cost of implementing them is higher than many small and midsize organizations with limited budgets can bear. Even large, well-funded organizations grapple daily with Internet infrastructure problems.

Interactivity takes many forms; it is not just limited to audio and video, nor solely to presenter-participant interactions. It represents the connectivity the participants feel with the presenter, other participants, facilitators, and peers.

It is likely Web-based training will come to be viewed as part of a training solution – not the total solution. Some training content will be presented over the web, other content may be in a CD-ROM format, print based, classroom based, interactive video, or on-the-job training with mentors.

onViz is a transitional product – designed to help overcome the present limitations slow Internet connections, differences in the way browsers display information, and a host of other current technical issues that make the deployment of multimedia over the Internet a difficult, time-consuming, and expensive task.

For e-learning apps, learners have to install the onViz software on their home computer, what do they do if they want to work on their course at work as well?

Many employers will not allow employees to install software on their office computers. Many learners try to catch up at lunch, for example, because they do not have

- The application at home
- Quiet at home

Because the onViz course executable is already on the learner's computer, along with any bookmarks for that course, unless the learner is using another computer, they will at any time be able to pick up where they left off.

It's even possible for a learner to upload their bookmarks to a predetermined web server or local network server, and then access the application from any other computer, regardless of a learner's location.

Why is onViz better than Powerpoint for creating presentations?

More companies than ever are relying on multimedia presentations to sell their products and services. Widely used presentation software, such as PowerPoint, isn't always suitable for getting the message across, which is where multimedia-authoring packages like onViz come in.

Research has shown that lecture style presentation results in only 5% knowledge retention, with increasingly higher retention rates from audio-visual presentations, demonstrations, learning by doing (such as interactive multimedia), and teaching others
(The Knowledge Web, Moe and Blodget , p. 175).

PowerPoint is not effective for certain tasks such as answering questions reiterating points, and providing a high degree of interactivity.

Presentations created using onViz can later be expanded to become a comprehensive interactive sales presentation that not only provides the opportunity to bring customers a deeper understanding about your product or service, it also can educate customers about what you do.

For example, you can create a sales presentation for a specific customer, and then later add additional content to create an interactive tutorial that guides the customer in using your product after they have purchased it. This provides added value for the customer.

Because onViz has the capability to pull together data from different sources, such as Internet-based sources as well as local networks, presentation components can be dynamically updated.

How can I be assured that you'll still be around as a company after I purchase your product? I don't want to get stuck with a product I can't use.

Well, just send us your order and we'll at LEAST be in business a while longer. Of course, investor inquiries are always welcome!

Seriously, can you even be sure Microsoft will be in business next year? And if they are, is there any guarantee you'll want to use their products? DSI has been around for nine years, and our CourseBuilder product is still being used by people who purchased it over nine years ago. This is a lifespan longer than most computer hardware OR software.

In addition, the media assets you use with onViz to create your multimedia or e-learning applications can be stored in external directories, readable by other programs. This way, it's easy for you to re-purpose your content for other authoring systems.