Technology Based Training & On-line Learning

An overview of authoring systems and learning management systems available in the UK

December 2002

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Introduction

Working with computers has never been easy because of the rapid changes that are taking place continuously in both hardware and software. Developers of technology based training have had to cope with improving graphics capabilities and other hardware advances such as sound, interactive video and, now, the Internet and intranet. This has, in turn, meant that the software has become more sophisticated. Those planning training using the computer now need to take into consideration many more factors when deciding what configuration of computer is needed to run the packages that they develop.

The scope of this report covers technology based training in Part I and learning management systems in Part II. In each part we provide a brief discussion about the subject followed by a few suggestions of specific features and facilities of the systems (and suppliers) that you might look for depending on your circumstances.

Some of the authoring systems described in Part I include learning management features and some of the learning management systems in Part II include some authoring systems features but if you are looking primarily for authoring systems look in Part I. For learning management systems look in Part II. Some suppliers provide packages both for developing TBT and for managing learning. These include Mentergy, click2learn and Trainersoft. Where there are links we generally indicate this but the list of suppliers at the end of the report identifies the products that we have discussed for each supplier.

There is a Glossary that describes terms and abbreviations.

Part I Technology Based Training and the use of Authoring Systems

Whatever your requirements you are unlikely to find the ideal authoring system so how do you go about making an objective assessment? We shall consider a number of criteria under the following headings:

- What is an authoring system?

- Who is the training for?

- What types of training are to be taught?

- Who will be developing the training?

- What features do you need in the authoring system?

- How will the training be delivered?

- How well is the authoring system supported?

- What will it all cost?

Before going on to discuss the above points we shall attempt to describe what technology based training means or, at least, what it means in the context of this report.

What are technology based training (TBT), on-line learning and e-learning?

The term **technology based training** is a bit of a catchall term that can be interpreted to include most forms of training that use the computer for delivery. It is most often taken to refer to computer based training (CBT), web-based training (WBT) and interactive multimedia training. Computer based training and interactive multimedia training are generally synonymous today as most good CBT includes multimedia elements since this is what the target audience is used to from their use of other packages on the computer. The term multimedia, in the context of this report, covers computer presented information that uses a variety of media. The media covered include text, graphics, animations, sound and video. Video and sophisticated animations still have to be used with care on many computer systems because they can cause performance problems. The term web-based training means the delivery of computer based training over the Internet and intranets. Problems with data rates (bandwidths) over the telecommunications links frequently make extensive use of graphics, animations, sound and video presentations over the Internet and intranets impractical as elements of web-based training because the responsiveness of the training can be slow and unpredictable.

The interactive element in CBT and WBT comes in when the student answers questions posed by the training and receives immediate relevant feedback or participates in a simulation. The relevance of the feedback to questions and actions is an important element in high quality interactive training. The current position with WBT is that it is generally less sophisticated than equivalent CBT because of bandwidth problems and the difficulty of supporting some of the more sophisticated interactions. This does not mean that there are not good examples of WBT in use; they are just different. The situation with WBT is improving all the time. There are plenty of examples that can be freely viewed on the Web. Many of the Web sites given in this report provide examples.

So what is **on-line learning**? It comprises the delivery of education and training and the support of the learner remotely using a computer network. An on-line learning system might deliver training materials that can be downloaded over the Internet or an internal network, web-based training, tutorial support, on-line conferencing, facilities for learners to submit assignments over the network and so on. It is thus

a networked support environment for learners that may be provided by a university or college, a commercial provider or within an organisation. The work done may be vocational or lead to qualifications.

That leaves us with **e-learning**. We define e-learning as:

"the integration of technology-based learning materials, support and services to provide

flexible learning opportunities using a browser-based system".

This means that e-learning is a sub-set of on-line learning where that learning is specifically delivered over the Internet and intranet. Others have broader definitions that may go as far as covering all forms of learning delivered using a computer i.e. what we have defined as TBT.

Systems that support on-line learning and e-learning are discussed in Part II.

What is an authoring system?

An authoring system is a software package that supports trainers and developers so that they can produce interactive multimedia courses efficiently. Essential components are:

- facilities that allow developers, who may not be computer experts, to enter the training content onto screens in an attractive way

- support for linking screens of training material together into modules

- support for a range of question types so that the course designers can choose the most appropriate for a particular situation and provide variety for the student

- response analysis that takes the student's answers to questions and provides feedback and makes branching decisions based on the student responses.

Other features that will usually be provided with differing levels of sophistication are multimedia support, recording of student and course details and support for the Internet and intranets.

Some authoring systems are designed to be easy to use by people with limited computer skills. Others can support users with different levels of computer expertise by having, for example, a programming or scripting language that the less technically skilled developer may never need to see. The complete authoring system may be very comprehensive or quite simple. You generally get what you pay for.

Who is the training for?

How many trainees are there and where are they? TBT tends to be most easily justified if there is a large number of trainees who are widely dispersed, but this is not always the case. Instructors may be scarce. There may be relatively few highly paid trainees who need to be taught at specific times to make them productive as soon as possible but who only need training in ones and twos.

Is there a steady or growing need for the training over an extended period?

What is the likely attitude of the trainees to computers? Some groups will be afraid of the keyboard and mouse – a surprising number despite all the talk of information technology. They do not generally cause much of a problem as the fear of the technology can, in our experience, be rapidly overcome with sympathetic handling. But the problem must be recognised when it occurs. This comment and several later assume that the TBT is robust and that the training is at least quite good. We say 'quite good' because it is remarkable that some mediocre courseware with little interaction does seem to teach well enough.

Are computer-related topics being taught? Programmers, systems analysts, IT managers, data entry operators or call centre staff will have requirements and expectations quite different from those of people who may be largely computer illiterate and who just wish to use the computer as a training tool much as they would use a video player or an audio cassette player.

What types of training are to be taught?

Do you need TBT in the first place? TBT can teach a lot of subjects very well, but it does not solve all training problems. It may well be that TBT is appropriate for parts of the training. Management simulations and games usually fall into this category where group discussions are used to draw out and expand upon points raised by the TBT. The possible involvement of a tutor or the learner's boss or colleagues may need to be allowed for. An aspect for e-learning is the virtual classroom which can support dispersed learners almost as though they were in a class with the tutor. See the descriptions of CentraOne, HP Virtual Classroom and Interwise Enterprise Communication Platform in Part II. In addition, some full LMSs are now including their own versions of virtual classrooms as an integral component of their systems.

The use of TBT to teach computer related topics can be very cost effective. There are very many successful examples of good TBT in this area.

There are some very extravagant claims being made for e-learning because of the relative ease with which it can be delivered to thousands of staff within an organisation throughout the world.

Who will be developing the training?

TBT will almost invariably be developed by a team even if most of the work falls on an individual. Certainly, the training will benefit from discussion of the courseware as it is developing. The skills of the people actually using the authoring system will be important in the selection of the TBT system.

How much does the courseware developer know about computers? Most authoring systems make great play about being for the person who is not a computer specialist but, in fact, most people developing TBT will have to gain quite extensive knowledge of the capabilities of the computer – character sizes, colours, fonts, graphics resolution, animation, web delivery, student recording – and a variety of administrative jobs such as copying files for back-up, making runtime versions of the training and how to use other features of the computer operating system and the web. The amount that the author needs to know depends on the support that is readily available from a computer expert.

With the use of high quality graphics and animation, support from a graphic artist who understands computers may be important. If full multimedia is to be used an additional range of video, audio and filming skills must be included in the team or bought in.

What features do you need in the authoring system?

How well does the system support commonly available features of technology based training and interactive multimedia? Features to be considered here include:

- Support for a variety of question types (multiple-choice, open ended, true/false, form-filling, drag and drop, etc.), the matching of student responses and subsequent branching. This is crucial if you are to write training that is responsive to the individual needs of learners.
- Interactions using the mouse as a pointing device and for dragging objects.

- Graphics and colour. Taking the PC as an example, there are different qualities of graphics and colour that can be supported. Wherever possible, anyone starting on the TBT path today should specify 800 x 600 screen resolution and 64,000 colours as the minimum standard.

- The variety of different character sizes and fonts that are available.

- Multimedia support. If sound is needed check that the PCs on the desktop can deliver sound. Many organisations either exclude sound from the desktop PC or don't permit the use of sound. If sound is essential it may mean the TBT has to be delivered in a learning centre.

- Support for special devices such as a touch-sensitive screen, light-pen and other equipment which may, for example, be a slide projector or a piece of apparatus.

- The ability to interface with programming languages. This may allow the trainer to do non-standard functions by getting a computer programmer to write a special program that can be linked into the courseware. This is an advanced feature but one rule with authoring systems is that, as an author gets familiar with the authoring system, he or she will want to do some things that the system does not do as standard. The answer, if the authoring system is basically suitable, is usually to find another way of doing them and using a programming language, such as C + +, Macromedia Flash or HTML for web delivery, is a common solution.

- The productivity of the system. Many authoring systems are provided with more than one level of use as discussed earlier. This means that the novice or occasional author can use the system in a simple fashion and follow a basic sequence dictated by the authoring system. More experienced authors can access the system at a different level and use the features much more flexibly but they are then more on their own with less hand-holding from the authoring system. Another aspect of productivity is covered in the next paragraph on performance of the system.

- The performance of the system. This is largely dictated by the power and configuration of the computer equipment used for development and presentation. Considering development first, authoring systems tend to use quite a lot of computer power so it is sensible to provide the development team with high performance systems.

- The above is important, but having adequate performance when the training is run by students is more so. The training must be tested by the authors on the minimum configuration that trainees will use to see how it performs and take remedial action if necessary.

- The Internet/intranet can be used in two ways. It can be used to download interactive training to local computers so that it can be stored and delivered locally or it can be used to deliver WBT on-line. The speed of transfer of data may have important implications for the overall performance of the training and, therefore, the student's satisfaction with the overall delivery method. This can be far more important than the performance of the PCs that are used by the students to study the training.

- LMS (learning management system) facilities. This term now seems to be replacing other terms with a similar meaning such as CML (computer managed learning). LMS covers such aspects as registering students on courses and recording progress, test results, course usage and study times. The level of LMS provided by authoring systems varies widely. In some cases they are very basic and some suppliers have separated the authoring systems from the LMSs. It is important to consider what level of LMS you are likely to need to ensure it is available.

  LMSs that are being marketed to support the delivery of training over networks and in other ways are described in Part II of this report.

How will the training be delivered?

What equipment will be used? Because of the widespread use of the Personal Computer (PC) in business today the majority of TBT either for use within an organisation or for general sale is produced to run on a PC. If an organisation has many PCs in locations where TBT is to be offered and these can be made available for training, the TBT must be designed to run on the minimum standard computer configuration. This means that the training department must find out:

- The minimum computer memory on the computers

- The disk storage capacity

- The quality of the graphics supported in terms of colour and resolution

- Is a mouse or other pointing device to be used?

- Is multimedia to be included now or later?

- What is the level of networking?

- Is CD-ROM to be used to distribute or deliver the courseware.

- Is the Internet/intranet to be used to distribute or deliver the courseware?

What other material comprises the complete course? There may be a coursebook to go with each course but there also may be videos, audio tapes, PowerPoint presentations, Word or Acrobat (PDF) files to be printed, trainer notes, etc.

The delivery, whether it is CD-ROM, local networks or over the Internet/intranet must be reliable.

Students will be rapidly turned off TBT if the courseware or the computer system does not perform satisfactorily due to hardware or software faults

How will trainees using the TBT be supported? It is one thing to get TBT courseware developed and tested so that you know you have a good product. It is another to ensure that the courseware is used. This area must be thoroughly considered when the use of TBT is first planned. Since one attraction of TBT is that it can be provided at the trainee's workplace it is certain that, in many companies, some of these trainees will be working remotely from any trainers. The training must therefore be reasonably self-supporting. You may be able to assume that there is someone at each location that will be able to get the TBT up and running and help new students to get started. If the training is to be provided in learning centres, support for the learner should be easier.

The need for, and role of, tutors also needs to be considered. The level of tutor support will depend on various factors but the topic and target audience will be important. It may be possible to train people with suitable knowledge to act as tutors on-site or to have telephone, computer conferencing or email support. Computer conferencing provides a means of peer discussion over a network with the

appropriate level of tutor involvement incorporated. There is a also the possibility of using virtual classrooms as mentioned earlier.

Will course usage be recorded? The computer managed learning (CML) aspects of TBT can provide useful information on such areas as those mentioned earlier (in LMS facilities). In addition, an LMS can be used to record data to help with validation and evaluation of the course during the final stages of development.

Maintenance of courses must also be planned. The logistics of ensuring that all users are studying the most up-to-date version of a course can be daunting. This is an area where WBT has a marked advantage as there is only one version to be kept up-to-date.

How well is the authoring system supported?

All the authoring systems mentioned in this report are marketed in the UK. Some of the systems are marketed more actively than others. You will need to find out the following about any system that you are considering:

- Has the firm selling the authoring system in-depth knowledge of TBT?

- What technical support is provided, where and at what cost?

- Is the potential supplier financially sound? Is the company that developed the authoring system, if different, financially sound? (Many of the systems to be discussed come from the USA so this point and the previous one may be crucial.)

- Is the product being actively developed to support new features?

- How many systems have been sold? (This may not always be quite fair if an exciting new system has been developed, but there are not usually many prizes for being the first to try a new piece of software – let someone else find the bugs.)

- How do other users like the system and how good is the supplier support in reality? Talking to users is usually a good idea.

- Do independent consultants using the system rate it highly?

What will it all cost?

What does the authoring system cost? Is there an annual fee for support and upgrades to the system? What training is necessary for the authoring team? Few authoring systems actually include TBT courseware to train their potential authors and TBT would not be the right medium for the whole of the training. However, an introductory TBT course would be useful in most cases and could do what TBT potentially does so well – bring students with widely ranging initial levels of knowledge up to a common level. Classroom courses could then take over. The cost of any necessary courses and accommodation and travel expenses must be allowed for. In-house training may be appropriate.

What will the supplier or an independent consultant charge for additional consultancy days? The most popular systems have very useful user discussion groups on the Internet where users can ask their peers for help with problems. They generally work very well and are free.

When you buy your authoring system you may be purchasing a variety of rights. It depends on the system that you are buying. You probably want to do two things with your authoring system – develop courseware and present the course developed to trainees in your company and, possibly, outside. You may also only wish to deliver TBT that you have bought in from outside your company.

Consider the case of a company that wishes to develop TBT at their training centre and then deliver the training on microcomputers or over the company intranet at a number of remote sites. They will need to purchase one or more copies of the development system for the training centre. When it comes to delivery, most authoring systems today permit the developer to distribute run-time versions of courses internally without a fee. This may not always be the case so it is important to know the ground rules before purchasing the system.

A look at a number of authoring systems

The criteria given above are not exhaustive and are not all likely to be universally applicable but they hopefully illustrate the range of factors that need to be considered when investigating authoring systems. Any reasonably objective assessment will involve setting up a rating sheet so that each authoring system under consideration can be evaluated against the criteria that you establish. You may then have to weight the different criteria to reflect the relative importance of each.

There are circumstances where it may be more appropriate to use a programming language such as C++ or Visual BASIC as the development tool. When developing WBT it may be appropriate to write the course using HTML (with JavaScript). This is most likely where there is a poor choice of authoring systems for the particular delivery platform for the TBT or where there are particularly complex simulations. Once a series of standard routines has been written to handle interactions, answer analysis, screen display requirements, etc. programming languages can be quite productive but they do need developers with more computer skills.

Most of the widely available authoring systems currently available in the UK are discussed in the following pages.

We have also included at the end of Part I a description of a product called Designer's Edge from Mentergy, which is a support package for the training design process. Although it is not an authoring system it is appropriate to include it in this report.

An alphabetical list of authoring systems

This listing covers a selection of authoring systems that are available commercially. The facilities provided by the different systems vary widely, as do the costs and the sizes of computers they run on. It is very difficult to give accurate prices for each authoring system because there are often many different options such as CML support, multi-user support, consultancy, etc. and, of course, prices change. We have therefore drawn up this price guide for each system.

A   Up to approximately £1,000 for a single-user development system. Presenting the training may, in a few cases, involve some royalty payment to the supplier on, for example, a per-copy basis.

B   From £1,000 to £5,000 for a single-user development system.

C   Over £5,000. These may be single-user systems. In some cases the minimum system available runs on a network and supports several users.

There are new systems coming onto the market regularly and those already there are developing, so you may have to investigate other systems as well as studying relevant ones from this list in detail.

You will find a Web site for each supplier. These will provide the most up to date information about the specific products. It is often possible to download an evaluation version of the authoring system or to order an evaluation CD-ROM.

If you wish to make any observations about the content of this listing please write to Christopher Dean at PeakDean Interactive Ltd, Snaithing Grange Annexe, Snaithing Lane, Ranmoor, Sheffield S10 3LF (telephone 0114 268 3700) or email him at christopher.dean@peakdean.co.uk.

This report is available on no extra cost in printed form from the DfES. Call 0845 60 223 60 and give the name of the report and the reference LLTD14. It can also be accessed as an Acrobat PDF file on the PeakDean Interactive Ltd web site at http://www.peakdean.co.uk or on the British Association for Open Learning web site at http://www.baol.co.uk/. Updates will be made to the web version periodically.

The entries in this part of the report are based on information provided by the suppliers of the authoring systems. It is intended to be factual; it does not attempt to review the systems in a subjective way. The information is being regularly updated and PeakDean Interactive Ltd will be pleased to hear of any new developments or new authoring systems that should be included.

Authorware 6.5

Runs on

IBM compatible PCs for development and can be delivered on IBM compatible PCs and Apple Macintosh microcomputers. The minimum recommended configurations are:

Development	
IBM compatible PCs	100MHz Pentium processor with 32MB RAM, Windows 95, 98, 2000, Me, XP or NT4.0, 640 x 480 x 256 colour (higher resolution strongly recommended), SoundBlaster compatible sound and QuickTime for Windows support.

Delivery	
Windows	The recommended configuration is the similar to that for development except that the amount of hard disk space needed depends on the applications that are developed and how they are delivered.
Macintosh	25MHz 68040 or 60MHz Power PC, System 8.1 or later (OS X Classic mode only), 24MB RAM, 640 x 480 resolution with 256 colours and a hard disk. The amount of hard disk space needed depends on the applications that are developed and how they are delivered.

Description

Macromedia Authorware is a multimedia authoring system of considerable power for developing multimedia training for delivery over the web, local networks and using CD-ROM. A training course is developed by building a flowchart of the course structure. The flowchart is built from a small set of powerful icons that are displayed in a toolbox on the screen. The flowchart is fundamental to the design process and prevents the author from branching to paths that do not exist. The developers use the flowchart during testing as they can break into the course at specific points while it is running, make changes and see the effects immediately. This encourages the author to make detailed improvements that might be too tedious or expensive to do with other authoring systems.

Other features include extensive self-documenting capabilities including the flowchart.

Many of the latest developments in multimedia training are supported. By using the support for multimedia that is available with Windows on the IBM PC, Authorware allows developers to integrate multimedia into their courseware with the minimum of trouble. MP3 streaming audio and media synchronisation are supported There is a Media Library that stores graphics, sound animations and other digital media in libraries that are separate from the course that is being developed. This can lead to considerable savings in storage space where, for example, the same illustration or movie clip is used at several points in a course. The Media Library also eases problems of updating and tailoring courses for different clients or user groups. An example of such an application would be a multilingual course where the audio and country specific illustrations for each language would be held in separate files with the relevant one being included as appropriate.

There is a Rich Text Editor that provides advanced formatting and supports embedded graphics and shapes. Authorware can also link dynamically to external rich text files.

Authorware provides Knowledge Objects. These are wizard driven templates that support developers as they include questions and quizzes in their training. Knowledge Objects support other functions such as developing application frameworks, logging in and the Windows Control Knowledge Object that provides check boxes, radio buttons, combo boxes and list boxes. These facilities assist those developing software simulations.

Price Range B

There is no charge for runtime versions of courses provided a suitable acknowledgment is made to Macromedia. Authorware for educational users is in the **A** price range.

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Web sites http://www.macromedia.com for information on all Macromedia products and http://www.macromedia.com/uk/store/ or http://www.upgrades.co.uk/ for UK purchasing information.

Authorware 6.5 *(cont)*

Macromedia also produce Director MX. See the separate Director MX entry for more details. Authorware can integrate Director MX applications into a course. It also supports digital video through Quicktime (on the IBM PC and Macintosh), Video for Windows (on IBM PCs) and AVI files.

There is support for most of the popular databases using ODBC drivers. Authorware has been enhanced in Version 6 to support the latest AICC specifications (see the discussion of standards in the Introduction to Part II). It also now supports JavaScript URLs to communicate with learning management systems that support the Advanced Distributed Learning Initiative (ADL) JavaScript-based runtime API for data tracking.

Authorware is up to date with its support of the Internet/intranet. Authorware courses and presentations can be delivered over the Internet and intranets. Hybrid CD and Web training can be developed. There is 'one button publishing' that allows developers to publish saved courses for web, CD-ROM or network delivery. XML based information can be imported using an XML parser.

Macromedia's Shockwave technology is used to support efficient operation over the Internet. ActiveX controls can be included.

Macromedia Flash MX vector graphics and animations are directly supported allowing powerful Flash animations to be integrated.

A SCORM Metadata Editor can be used to create a standards-compliant metadata file for courses.

Computer managed learning can be developed using functions within Authorware. Several of the learning management systems described in Part II support compliant courses written in Authorware.

The Authorware Macintosh Player, that is supplied so courses can be delivered on the Macintosh, is available in versions for CD-ROM/LAN and web delivery.

There is also a Minimal Web Player that reduces the standard Authorware Player by more than 80% and will run all Authorware 5.x applications upwards.

Standards

AICC, IMS, SCORM, ADL compliant.

DazzlerMax and DazzlerMax Deluxe

Runs on

IBM compatible PCs running Windows 95, 98, 2000, ME or Windows NT 4.0 or higher. The minimum recommended configuration is a Pentium II processor with 32MB RAM, 16-bit colour and a CD-ROM drive. 16MB of free hard disk space is required. For DazzlerMax Deluxe a higher specification is recommended.

Description

DazzlerMax is a development system primarily for multimedia presentations.

DazzlerMax Deluxe is an enhanced version with additional features to support interactive multimedia training. We describe the common features first.

Both systems are designed to be easy to use. They are based on palettes of icons. Authors drag-and-drop icons to form a course structure which is built in the Design window. A course is composed of a series of Task icons. Each Task comprises a set of Action and Response icons. Actions are used to build the screens users will see, and include Windows, Menus, Text, Graphics, OLE objects, Video, Animation and Sound. Responses describe which responses will be handled and how; they include Push Buttons, Hot Spots, Keyboard Input, Mouse Input and Notification messages. A third class of icons – Events – are used less frequently to interrupt the flow of the course, for example when a particular menu option is selected. Once an icon has been placed in the structure its attributes and behaviour are set using dialog boxes.

DazzlerMax supports delivery of training over the Internet or intranet. It provides an automatic HTML conversion option using the Presentation wizard and has the DazzlerMax Java Player that allows DazzlerMax courses to be delivered without conversion. It also allows the addition of DazzlerMax materials to a Web page.

DazzlerMax Deluxe offers an expanded range of Action and Response icons and is designed to support the more sophisticated interactions that are included in good multimedia training. Additional Actions allow Video and Tape Controls to be incorporated into applications and MCI Command Scripts can be used. The use of DDE, variables and functions is supported and there are File Read/Write facilities. DLLs can be linked and other applications can be run. Additional Responses include Menus, Listboxes and Frame Locations. Student recording is supported in DazzlerMax Deluxe.

In order to prepare graphics, animations, video and sound clips etc. for incorporation into DazzlerMax courses it is necessary to have the appropriate additional software for these media. The file conversion utility allows conversion of media files between the common formats. Autodesk (FLC) and digital video (AVI) can be converted to DazzlerMax's own animated widget actions. DazzlerMax allows authors to customise the Utilities menu to call these applications from within the authoring environment.

Two wizards are provided. The Question Wizard facilitates rapid production of standard questions. The Packager Wizard makes the production of runtime versions of courses easier. The Packager Wizard will produce runtimes that will run under Windows 3.1. It can also produce a single data file so that artwork included in the course cannot be decoded.

Media files can be set to pre-load so that the performance of the training is not unnecessarily degraded by delays in loading. It is also possible to use a predictive pre-load option and leave DazzlerMax to work out which files it should be pre-loading as the course progresses.

Run time versions of DazzlerMax presentations and courses are royalty free.

The TSC Process Simulator Link software (available separately) can be used to incorporate simulations of processes such as chemical plant operation or parts of the internal combustion engine into DazzlerMax courses.

Standards

AICC/IMS compliant. SCORM 1.0 – 1.2 compliant.

| Price Range | A | f or DazzlerMax |
| | B | f or DazzleMax Deluxe |

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Email sales@maxit.com
Web site http://www.maxit.com

Director MX

Runs on

Development	
IBM compatible PCs	Pentium II processor, 128MB RAM, Windows 98, SE, 2000, or XP, 1024 x 768 16 bit colour graphics, 100MB of available disk space. Directx 5.2 or later or OpenGL is recommended, as is a 3D accelerator.
Macintosh	Power PC (G3 or later recommended), 128MB of free available system RAM, Mac OS X 10.1.2 upwards, 100MB of available disk space, 1024 x 768 16 bit colour graphics. OpenGL 1.1.2 or later is recommended, as is a 3D accelerator.

Delivery	
IBM compatible PCs	Pentium II processor with Internet Explorer 4.0 or later, Netscape Navigator 4.0 or later or AOL 4.0 or later.
Macintosh	Macintosh Classic – PowerPC (G3 or later recommended) with Internet Explorer 4.5 or later, Netscape Navigator 4.0 or later or AOL 4.0 or later. Macintosh OS X – Power Macintosh G3 running OS 10.1.2 or later and Internet Explorer 5.1 or later

Description

Director MX is a very widely used development system designed primarily for interactive multimedia productions that are delivered using a browser. Macromedia also produce Authorware, which is aimed more directly at the interactive training market. There is, however, a considerable overlap in the capabilities of the two products. Authorware is covered earlier in this report. Macromedia produce a third relevant product called Dreamweaver MX with CourseBuilder. It is a product that is specifically for developing web-based training and is described next.

Director MX provides a system that allows the developer to build multimedia courseware that can include text, graphics, animations, digital video and sound and 3D graphics. There is flexible support for powerful browser based 3D graphics is an important element. Although it may not currently be relevant for much multimedia training it is an important development and opens up new opportunities.

There is a Hypertext type capability through a language called Lingo that provides flexibility in the sequencing of a presentation through the use of buttons. Lingo is a powerful scripting language that allows Director to be used for interactive applications including education and training as well as demonstrations, information and point-of-sale. Among Lingo's extensive array of keywords there are ones that support user interactions – user inputs, branching, keeping of scores and so on. It also has several hundred keywords that can be used to integrate interactive 3D animations, streaming RealVideo, streaming RealAudio and Flash 5.

Support for the Internet is integral and uses Macromedia's Shockwave technology for delivery of material produced by Director MX. Shockwave is a software package for creating and streaming multimedia over the Internet. It is supplied with Director MX or can be downloaded as a plug-in for browsers from Macromedia's web site

To develop learning using Director MX it is necessary to purchase either Director MX for Windows or Director MX for Macintosh.

Standards

AICC, IMS, SCORM, ADL compliant.

Price Range **A**

For either the PC or Mac version.

Contact UK

Computers Unlimited, The Technology Park, Collindeep Lane, London NW9 6BX
Telephone 0208 200 8282
Fax 0208 200 3788
Web site http://www.unlimited.com
Email webmaster@unlimited.com

Contact USA

Macromedia, Inc. 600 Townsend Street, San Francisco, CA 94103
Telephone (415) 252 2000
Fax (415) 626 0554
Web sites http://www.macromedia.com/ for information on all Macromedia products and http://www.macromedia.com/uk/store or http://www.upgrades.co.uk/ for UK purchasing information.

Dreamweaver MX with CourseBuilder

Runs on

IBM compatible PCs and Macintosh computers. The minimum recommended configuration is:

Development	
IBM compatible PCs	300MHz Pentium II processor with 128MB RAM running under Windows 98, 2000, ME, XP or NT 4 or higher (Windows 2000 Professional preferred), 275MB of free space on the hard disk, 800 x 600 resolution and 256 colour graphics (1024 x 786 with millions of colours strongly recommended).
Macintosh	Power Macintosh G3 or better running Mac OS 9.1 or later, or Mac OS X 10.1 or later with 128MB available RAM and 275MB of free space on the hard disk, a colour monitor capable of 800 x 600 resolution (1024 x 786 with millions of colours strongly recommended. Thousands of colours required for OS X).

Delivery
Any machine running a JavaScript enabled browser.

Description

Dreamweaver MX is Macromedia's own WYSIWYG web editor for creating web sites and Internet applications. The CourseBuilder for Dreamweaver MX extension adds features that are needed for delivering training to the features of Dreamweaver. It is a free download. The basic Dreamweaver package is a powerful and very widely used package that allows web pages to be created without any knowledge of HTML. Pages can be created which include JavaScript and other features such as Flash, Fireworks or Shockwave Director movies.

With CourseBuilder for Dreamweaver MX the author can create interactions such as:

- Multiple choice
- True/False
- Matching
- Fill-in-the-blanks
- Hot areas/Hot text
- Text entry
- Sliders
- Drag and drop
- Buttons
- Timers.

CourseBuilder includes Knowledge Track. This allows courseware to track data on a student's progress through a learning event. It can track such information as number of right and wrong responses, number of tries, timing information and score for an interaction. This information can then be transferred to any open, standards-based learning management system or saved in a database such as Microsoft Access, SQL Server or Oracle.

The code generated by Dreamweaver and CourseBuilder is web-native (HTML, DHTML and JavaScript) so there is no need to download any applets or install plug-ins in order to view the TBT.

Standards

AICC, IMS, SCORM, ADL compliant.

Price Range A

Contact UK

Computers Unlimited, The Technology Park, Colindeep Lane, London NW9 6BX
Telephone 0208 200 8282
Fax 0208 200 3788
Web site http://www.unlimited.com
Email webmaster@unlimited.com

Contact USA

Macromedia Inc, 600 Townsend Street, San Francisco, Cal 94103
Telephone (415) 252 2000
Fax (415) 626 0554
Web sites http://www.macromedia.com/ for information on all Macromedia products and http://www.macromedia.com/uk/store or http://www.upgrades.co.uk/ for UK purchasing information.

Everest 2.2

Runs on

IBM compatible PCs. The minimum recommended configurations are:

Development
IBM compatible PC running under Windows 3.1, 95, 98 or NT 4 with a Pentium processor, 32MB RAM and 10MB of space on the hard disk, SVGA graphics at 800 x 600 resolution.

Delivery
The recommended configurations can be lower, down to an Intel 386 processor with 8MB RAM, depending on the operating system being used, except that the amount of hard disk space needed will depend on the applications that are developed and how they are delivered. VGA graphics is the minimum for delivery.

Description

Everest is an authoring system based on the "book and page" metaphor, where the author creates individual books that contain several pages. Each page will contain a set of objects, which can be anything from simple text to multimedia and complex user interactions.

The author creates and edits pages using five editor windows by dragging and dropping objects from the tools editor into the page editor.

The five editor windows are:

- Author Window – provides the essential housekeeping functions of Everest such as file save, run, preview and print.

- Toolset Window – contains the icons used to build pages

- VisualPage Window – displays the pages as they are created

- Book Window – provides a flowchart for the book (module) being developed

- Attributes Window – displays the attributes of icons placed on a page. For example it would show the co-ordinates, colour, etc. of a textbox.

The structure of the book, pages and objects are shown as a diagram in the Book Window, allowing easy alteration of object properties via the Attributes Window. Everest supports a wide range of question types and complex branching.

Pages consist of a collection of objects. These objects can be saved and re-used. This helps productivity and consistency. Everest has extensive support for multimedia of all sorts and a wide variety of add-ins that can be incorporated to support, for example, databases and devices connected to the PC.

The programming language used is A-pex3, which is similar to the old BASIC. Its use is optional, depending on the complexity of the package. A-pex3 Assistant is a wizard that guides new developers through the creation of A-pex3 code. They just point and click on choices.

The author can test the package by starting at any page. A useful feature is the "editing on the fly" feature where the objects on a page can be altered and execution can be resumed either from where the author stopped, or the page can be re-run to apply the changes.

Everest allows intelligent use over the Internet where only relevant pages are downloaded. It also uses its own compression techniques to minimise the size of data transmitted. Development, as well as delivery, can be carried out via the Internet/intranet.

ERUN, is the run time version of Everest. It allows courseware to be delivered via the Internet/intranet, hard disks, using diskettes or on CD-ROMs. It also supports any combination of these media.

Everest provides INSTRUCT administrator software that supports and maintains a student database. It can create user access lists and generate reports. Another program (SUMCMI) can be used to collect usage statistics and item analysis.

There is a wide variety of add-on components that can be purchased from a number of suppliers to enhance the capabilities of Everest.

Price Range B

A free system can be obtained that has most functions. The purchased copy permits royalty-free distribution of courseware.

Contact USA

Intersystem Concepts Inc. PO Box 477, Fulton, MD 20759, USA
Telephone (410) 531 9000
Fax (301) 854 9426
Web site http://www.insystem.com/
Email intersys@insystem.com

FLEXeLEARN®

Runs on

Development
Personal computers with Pentium II 450MHz processors (or above) with 128MB RAM running Windows 95, 98, NT4, 2000 or XP with 12MB free hard disk space for the EDITOR and enough space for the courseware files.

Delivery
Internet Explorer 5.0 or higher with QuickTime 6.0 or higher is required for browser-delivered courseware authored in the EDITOR and exported in HTML/SMIL.

For delivering, tracking and managing browser-independent content and assessments with FLEXeLEARN PLAYER, TRACKER and TUTOR :

Personal computers with Pentium II 450MHz processors (Pentium III 750MHz recommended) with 128MB RAM running Windows 98, NT4 or higher, 2000 or XP (256MB RAM required for TUTOR on all operating systems). Minimum 12 x CD-ROM Player (for install). Apple QuickTime 6.0. Screen resolution – 800 x 600 (PLAYER) and minimum 640x480 (TUTOR). Sound card and speakers. Typically 200MB plus of free hard disk space is recommended, dependent on media richness of the content, e.g. digital video.

- A TCP/IP network connection is required for client-based networking of FLEXeLEARN PLAYER, TRACKER and TUTOR which do not use HTTP and HTML technologies.

- TUTOR requires a cabled or wireless (Infrared or RF) interactive keypad system and Data Projector or large display device (minimum display resolution of 640x480) for interactive assessment sessions.

Description

The **FLEXeLEARN®** suite of products comprises FLEXeLEARN EDITOR, PLAYER, TRACKER and TUTOR. They are designed to be used by training providers and educators with no programming or scripting language skills. Their primary applications focus is the development, management and delivery of blended learning solutions over the Internet, LAN/WAN (intranet/extranet) and stand-alone/CD-ROM platforms. EDITOR is considered in some detail and PLAYER, TRACKER and TUTOR are summarised at the end of this entry.

FLEXeLEARN® EDITOR is a rapid development authoring tool designed to make it easier for instructional designers, subject matter experts, trainers and educators to develop rich, interactive media content in the form of standards-based learning objects (see the Standards section below.) It is an easy-to-use, template-driven package that does not sacrifice power and creativity for ease of use and productivity. EDITOR enables a content developer to create a course structure in the form of a Contents Tree, comprising a series of re-usable learning objects(RLOs), by using drag and drop icons selected from a palette containing eight different node types. Node types denote the combination of primary media used to deliver the instructional message, e.g. audio, video, assessment, list and custom. Nodes are subsequently populated with raw media assets and synchronised to an event-driven timeline (where applicable) as RLOs of different granularity (size). Editing in the case of an audio node involves 'cueing' the audio timeline and then associating visual assets with the cues.

A Custom node for more experienced content developers, with programming or scripting skills, enables a wide variety of HTML-enabled objects such as Flash, Shockwave or Java Applets to be included and/or edited in the courseware.

Once populated, node sequence changes are effected by simple drag and drop re-positioning. Copy and paste functions enable the Contents Tree to be rapidly populated with RLOs from other courseware.

This facilitates independently collaborative, asynchronous authoring by different instructional designers and content developers who can effectively work on different parts of a course at different levels of granularity and at different times and locations. Discrete courseware elements can be subsequently combined into one complete course seamlessly.

Price Range | B

Muliti-pack corporate and educational licensing is available

Contact UK

FLEXeLEARN® Limited, Campus 3, Balgownie Science & Technology Park, Balgownie Drive, Aberdeen AB22 8GW, Scotland

Telephone 01224 332144
Fax 01224 332005
Email Jeremy.Daly@flexelearn.biz
Web site http://www.flexelearn.biz/

FLEXeLEARN® *(cont)*

The Assessment node provides an easy-to-use set of templates for designing and creating multifaceted tests, tutorials and competency assesssments using various combinations of question types: True/False, Multiple Choice, Multiple Choice Multiple Answers, Fill-in-the-Blank, Hotspot and Drag & Drop. Other question types, e.g. short essay, application simulations and role play simulations can be incorporated using the Custom Object node. All question types which support instant feedback and mastery score level can be selected randomly from a bank of questions and the order of chosen questions shuffled to avoid rote learning. FLEXeLEARN can also supply sample source code so that users can ensure that their assessment objects communicate with SCORM/AICC-conformant LMSs and LCMSs through the FLEXeLEARN® API.

The EDITOR is bundled with a Microsoft PowerPoint Add-in called **FLEXeLEARN® PowerX,** a practical cross-platform utility for converting passive PowerPoint content into SCORM conformant learning objects that preserve the layers of each individual slide in JPEG format. PowerX can also repurpose PowerPoint content as interactive close-captioned SMIL movies using the source PowerPoint slide titles, speaker's notes, audio narrations and movies. This is becoming increasingly important for content that must conform to new e-learning accessibilty legislation.

To support software applications training, a simple screen capture and image editing tool is included with the EDITOR. Once an image has been captured, editing tools can be used to label or describe different areas of the captured screen or image. When an image is opened or pasted from the clipboard, the image editor window dynamically resizes to accommodate the image, then allows the user to resize and apply graphics filters to sharpen or blur the image. Multiple image file formats are supported including JPEG, GIF, BMP, PNG and TIF.

Published content can be updated or edited without re-compiling or re-testing the courseware whether delivered via TUTOR, PLAYER or a browser in HTML/SMIL. This means, for example, that a generic course could be delivered at different locations with images that are appropriate to each location while retaining exactly the same course structure for every version.

EDITOR also enables the content of published PLAYER courseware to be password protected and encrypted by the author to protect it from unauthorised editing and content abstraction respectively.

FLEXeLEARN® PLAYER is a functionally rich, interactive media player for browser-independent delivery of content authored in **FLEXeLEARN® EDITOR**. It can be used for e-learning and dynamically switched to deliver multimedia presentations for Instructor-led training. PLAYER's interfaces support different learning styles, bookmarking, filtered search, external hyperlinks to other learning resources and self assessment. Completed scores can be displayed as a summary report and printed or saved as a text file. PLAYER runs on stand-alone PCs and/or client-server platforms. Dependent on limiting or fluctuating bandwidth constraints, rich interactive media can be accessed directly from CD-ROM or stand-alone PC or accessed, downloaded and updated over any TCP/IP network connection simply by double-clicking a .FEL extension file or selecting a hyperlink in an e-mail or web site.

FLEXeLEARN® TRACKER adds lightweight database management functionality to PLAYER for extended enterprise tracking and recording of remote or mobile learner progress. TRACKER provides enterprise controlled access to password protected and encrypted learner progress data that can be automatically uploaded to, and managed from, a central point over any TCP/IP network connection, or written to a secure offline datafile.

FLEXeLEARN® TUTOR is a unique Training Content Management System (TCMS) designed to support the development, management and delivery of strategically blended learning components within 'live' classroom environments. These components combine aspects of self-paced computer-based training (CBT), computer-managed group instruction (CMI) and interactive assessment (using wireless delegate-voting technology) and Instructor-led face-to-face computer-assisted instruction (CAI).

TUTOR provides trainers and educators with the operational autonomy to author and store their own discrete learning objects in its learning object repository and retrieve, assemble and deliver learning paths using these objects. TUTOR runs on Windows-based stand-alone PCs and/or client-based TCP/IP networks within a single or multisite environments.

Standards

FLEXeLEARN have worked extensively to make courseware developed with the EDITOR conformant with existent and emerging elearning standards for interoperability and re-usability including SCORM v1.2, IMS Question & Test Interoperability (QTI) specification, AICC AGR-010 Web-Based CMI Guidelines, Section 508 of the US Rehabilitation Act and W3C HTML 4.01.

Interoperability

FLEXeLEARN courseware authored in FLEXeLEARN EDITOR has successfully demonstrated interoperability with over 25 leading Learning Management Systems and Learning Content Management Systems.

HyperStudio 4.2

Runs on

Development
IBM compatible PCs running under Windows 3.1, 95, 98, NT or 2000. Apple Macintosh running system 7.5 and later. Both with 16MB of RAM, 30MB Hard disk, CD-ROM.

Delivery
HyperStudio will run on low specification configurations of each of both the IBM compatible PC and Apple Macintosh but requires at least 256 colours on the PC. Lessons can be delivered over intranets and the Internet with most browsers provided a suitable plug-in (supplied with HyperStudio) is downloaded.

Description

HyperStudio is a low cost multimedia development system specifically designed for use in education. It uses a stack structure to develop interactive teaching and learning packages and presentations. It has been used successfully by developers aged four and above! It is, however, also used for developing substantial education and training packages. Its cross platform capability is an attraction, particularly in education. HyperStudio stacks created on one platform can, with minor or no modification, be run on the HyperStudio player on other platforms.

HyperStudio has extensive support for multimedia and applications can be delivered as WEB PAGES as well as on disc or CD-ROM. A HyperStudio stack can be published as part of a web site either as a full screen or as animation within the page. All the functionality of the original HyperStudio stack is available over the Internet provided the user has the HyperStudio Plug-in installed in their system. There are several enhancements to HyperStudio 4 to support its use over the Internet/intranet.

The Content Curriculum Library provides a large quantity of backgrounds, clip art and sounds that can be included in screens. Alongside this resource are samples of projects produced within schools, the home and community, the workplace and commercial publishers, together with tutorials showing how to use HyperStudio.

A stack, or series of stacks, is set up for the application and then cards are developed individually. On-line help is available. The presentation of each card and its functionality are defined by the stack builder. Backgrounds, text, colours, sound, animation, movies, etc. can all be included.

- Backgrounds can be custom designed, or can be copied from the extensive range included on the resource CD.

- Text can be added to the background or can be included in a text field. This text field can be read only, can allow for new text entry, or can automatically scroll up the screen like cinema credits. Text can be any size or style available on the user's computer system.

- Images can be taken into HyperStudio from a variety of sources – the resource CD, digital cameras or clip art resources.

- Video images can be played 'live' through HyperStudio, or can be digitised on both Macintosh and PC. (With appropriate video card)

- Animation can be both frame or path. Animations created on many other animation applications can be imported into HyperStudio.

- QuickTime movies and AVI movies can be incorporated in the appropriate HyperStudio versions.

- Buttons are the main navigation tools within HyperStudio and can take many forms. They can:

  - be transparent, and cover a graphic

  - be produced with an icon from the range supplied on the resource CD

  - require a mouse click, be sensitive to the mouse being over them, or can work automatically after a pre-set time

Price Range A

A single user licence for Hyperstudio is currently £100 for educational users.

Contact UK

TAG Learning Ltd, 25 Pelham Road, Gravesend, Kent DA11 0HU
Telephone 01474 537886
Fax 01474 332667
Email info@taglearning.com
Web site http://www.taglearning.com/

Contact USA

Sunburst Technology,1900 South Batavia Avenue, Geneva, IL 60134-3399
Telephone +44 01474-537886
Fax +44 01474-537887
Web site http://www.hyperstudio.com/

HyperStudio 4.2 *(cont)*

- control the start of sound, movies or movement to other cards/stacks

- record correct/incorrect responses to screen prompts

- run Logo procedures to perform programmed activities

- open other files and/or applications

- give direct access to specified web sites via the installed browser, etc.

Drag & drop – You can click and drag any element supported by HyperStudio directly onto a card. Images can be dragged from web sites, your hard drive or content CDs. Movies or sound can be dragged onto a card and it automatically attaches itself as a card action.

HyperLogo, the scripting language of HyperStudio, can be built into stacks and allow for different responses to the answers given to questions. When an appropriate response has been given a transition effect can also be selected to improve the flow between cards and stacks. HyperStudio moves seamlessly between cards and stacks such that the stack 'browser' rarely knows when they are moving between stacks or simply between cards on the same stack. HyperLogo is supported with context sensitive help.

When you have finished developing your product the HyperStudio Player can be used to produce royalty-free run-time versions for distribution.

HyperStudio's Export Web Page and the HyperStudio plug-in can be used for distributing packages on the web.

There are a few new enhancements for HyperStudio 4.2.

There is now an Integrated Media Library Browser. What this means is that a new "Show Media Window" option now appears under the Options menu in HyperStudio. This causes a dialog to appear that maps the contents of the Media Library folder in the HyperStudio folder. All folders and their files appear in a drop-down list that can be dragged onto cards, which we have already discussed. Further, unique HyperStudio objects like buttons, text and graphics can be dragged from a stack into the Media Window. Free copyright-friendly media and HS4 objects are available from the HyperStudio Library.

Another key feature is Stack-To-Go. This provides the ability to save a stack as a stand-alone application. This means that users can just double click the stack and it runs. Stack-To-Go allows you to save your stack without any dependence on external files (images, text, sound etc.). This means it is possible to share projects with others.

Those unfamiliar with programming can be helped out when programming with the HyperLogo programming language. This is relatively simple to use and designed for HyperStudio. There is now an interactive "click programming" environment for HyperLogo scripting. This also includes extensive context sensitive help.

HyperStudio now comes with Morph 2.5. This digital video creation program is sold with HyperStudio 4.2. With Morph, you can create QuickTime or AVI movies. Plus, with Morph, you can create warping and caricature effects of still images or create dynamic morphs between two digital movies. The resulting movies are easily imported into HyperStudio projects. Upon installing Morph, HyperStudio 4 also adds an Extra so you can launch Morph from the HyperStudio menu bar.

Illuminatus Opus

Runs on

IBM compatible PCs. The minimum recommended configurations are:

Development

IBM compatible PC with an Intel Pentium II processor and 64MB RAM running Windows 95, 98, 2000, Me or NT with Service Pack 4, 16 million colours with 1024 x 768 resolution, 50 MB space on a hard disk, CD-ROM.

note that this is the minimum recommended configuration. Illuminatus Opus will run on a PC with a much lower specification but the performance will suffer.

Delivery

The final publication can be produced to run in Windows 95, 98, Me, 2000 or NT4.

For delivery over the Internet/intranet, Internet explorer 4.0 or later or Netscape Navigator 4.0 or later is required with the [iO](tm) streaming web plug-in. This is supplied with Illuminatus Opus or it can be downloaded free from the Digital Workshop web site.

Description

Illuminatus Opus is an authoring system that is based on the book, chapter and page metaphor. It is designed to be an easy to use package for developing general interactive multimedia applications but it can be used for CBT courses where appropriate.

Each book is made up of one or more chapters, which can have a common style and size for all its pages. Each chapter consists of one or more pages. The hierarchy of each book is displayed on a panel on the side of the screen. Pages can be created or edited by placing objects onto them.

The main objects used for creating pages are:

- frames that are used to group objects together

- text

- images

- video

- text input allowing the reader to type information

- digitised sounds or music and slideshows displaying a series of images in sequence.

The Illuminatus Opus workspace that is used for development is divided into three sections:

- The organiser on the left displays a tree structure of publications open and the objects in them

- The component gallery at the bottom provides a series of objects, and combinations of objects which can be pulled into the publication

- The main window displays the page being edited or thumbnails of all the pages in the publication.

In addition, there are objects in the component gallery such as buttons and video controls. These objects can be dragged from the component gallery and dropped onto the page. They can also be created by the author and optionally saved in the gallery. The objects have certain properties. These can display when the page shows or they can appear or disappear depending on a set of actions.

Text objects can include an auto narrate feature which plays a sound file such as recorded speech whenever the text object appears on the screen.

Digital Workshop also produces PaintShop Pro so it is not surprising that the graphics features are extensive. Vector graphics are supported.

There is a DocView option so that Microsoft Office or Macromedia Flash files can be displayed on a page.

Price Range A

Contact UK

Digital Workshop, 42-44 North Bar, Banbury, Oxon OX16 0TH
Telephone +44 (0) 1295 258 335
Fax +44 (0) 1295 254 590
Email enquiries@digitalworkshop.com
Web site http://www.digitalworkshop.com

Illuminatus Opus *(cont)*

There is a Question Wizard that helps with the creation of tests and quizzes. Branching, scoring and variables can also be included in a book. There are basic maths functions and a spellchecker. Bookmarking and passwords can be included.

There is an Animation Wizard to support the step-by-step development of animations.

The programming of pages and books is controlled by "actions". Actions are created using a dialog box, which allows certain options. An action can be triggered by a number of events, for example a delay, or in response to a user interaction such as a mouse clicking on or moving over an object. Once an action is triggered it will perform the associated task. This task can be anything from displaying objects, playing sound or branching to another page or book.

There is also a "Browser Viewport" which provides a live view of other Internet pages.

Finished courses can be published using the Publish Wizard. They can be published as Windows programs, directly to the Internet to be run with a Netscape plug-in or an Internet Explorer ActiveX control. Alternatively the courses can be published for use on the web by publishing them as HTML pages or by using the [iO](tm) streaming web plug-in. No royalties are payable.

NeoBook for Windows Version 4

Runs on

IBM compatible PCs running under Windows 95, 98, Me, 2000, XP or NT 4.0 or later with 32MB RAM. 10MB of free space is needed on the hard disk.

Description

NeoBook is a low cost, easy to use system for developing electronic publications and presentations. It has not been specifically designed for the production of TBT although there are some TBT functions included but it is suitable for the purpose and provides good multimedia support.

NeoBook uses a floating toolbar to allow users to develop multimedia applications using drag and drop commands. Text can be imported as ASCII or RTF files making NeoBook compatible with most word processors and text editors. Most common image file formats are also supported for importing pictures and it can play most common multimedia file formats.

The features of the NeoBook include:

- support for different button types
- transition effects between pages
- flexible presentation of text, backgrounds and graphic elements
- the ability to create animated cartoons,
- sound, music, video, animation and other multimedia files.
- links so that data can be read from and written to external files.

Other programs such as word processors, animation and paint programs can be accessed directly from NeoBook during development of courseware. A NeoBook application can also be used to launch other Windows or DOS programs.

Interactions can be included by using hotspots, command buttons, text entry fields (with validation), check boxes, etc. Calculations and scoring can be included. There is a powerful scripting language for more advanced users that provides more control for such additional features as variables, conditional statements, looping, string processing and file input/output.

There are preview and debugging tools and, when the end product is ready for distribution, NeoBook can create a complete stand-alone Windows application (as an EXE file), screen saver (SCR) or Internet Explorer plug-in that can be distributed without royalties. Publications can be distributed on diskette, CD-ROM, over networks and the Internet and intranets.

NeoBook is available in English, French, German, Italian and Spanish.

An evaluation version can be downloaded from the NeoBook Web page.

Plug-ins and add-ons are available.

There are several new features in Version 4:

- A built-in word processor designed especially for creating NeoBook content. Tables, hyperlinks and bookmarks can easily be added.
- There are more action commands to show/hide/move objects and display file lists. There is also greater control over the appearance of the final publication, including custom shaped windows, gradient backgrounds and an optional title bar.
- Helpful new tools, including list box, combo box, track bar, video player with VCR controls, text entry field with validation, timer, web browser/HTML viewer and animated GIF.
- Support for MP3.

Price Range A

Contact UK

The Thompson Partnership, Lion Buildings, Market Place, Uttoxeter, Staffs
Telephone +44 (0) 1889 564 601
Fax +44 (0) 1889 563 219
Email support@ttp.co.uk
Web site http://www.ttp.co.uk/

Contact USA

NeoSoft Corp. PO Box 5667, Bend, Oregon 97708-5667
Telephone (541) 389 5489
Fax (541) 388 8221
Email sales@neosoftware.com
Web site http://www.neosoftware.com

Quest 7.0

Runs on

Development
Personal Computers with Pentium 133MHz processors (200MHz or higher recommended) and 64MB RAM (128MB recommended) running Windows 95, 98 or NT4.0 or higher (NT recommended) and SVGA graphics.

Delivery
Personal Computers with Pentium 90MHz processors (133MHz or higher recommended) and 32MB RAM (64MB or higher recommended) running Windows 95, 98 or NT4.0 or higher and SVGA graphics.

Description

Quest 7.0 is an object oriented development system. It uses flowcharts to build a course. This is similar to other authoring systems such as Authorware and DazzlerMax. The flowchart built at the Title Design level provides the courseware designer with a clear overview of the overall course structure as it develops and before adding the content. The Frame level allows the author to build individual frames and sequences.

There is a QuickStart template system. It provides a wizard that offers the developer a set of templates from which they choose the type of course they wish to develop and the look and feel they want to apply to the course. It then applies it to the course.

The facilities provided are comprehensive both in terms of the editing and checking features and in multimedia support. There are also debugging facilities.

The flowchart initially comprises a series of empty frames. Frames are developed in a WYSIWYG (What You See Is What You Get) environment using powerful sets of tools that display in movable tool windows. As the frames are produced Quest 7.0 displays a "postage stamp" representation of the contents of the frame in the small frame outline in the flowchart. This is a useful visual reminder of the contents of a frame. At the frame level Quest 7.0 provides some interesting and useful facilities. Developers can define "Smart Spots" as areas on the screen for selecting with a mouse or touching on a touch screen. Smart Spots can be any shape and size and multiple non-contiguous areas can be defined with the same attributes. Quest 7.0 builds a script called Quest C. The naive user need never use Quest C but, for advanced use, it provides a powerful interfacing capability to the C language and to Windows DLLs. There is a C Coach that takes users through the steps of declaring variables, calling functions and calling DLLs.

FastTracks offers pre-built libraries of screen layouts, buttons, interactions, etc. that can be used as starting points by developers. They can then be tailored as necessary to suit specific uses. This makes re-use of material easy and, apart from saving time, aids the development of consistent training.

Quest 7.0 provides a variety of techniques for analysing answers to questions including a Test Answer Analysis Wizard for the answers to open ended questions.

There is an interactive debugger that traces all objects and C programs used within a course and helps developers to isolate and correct bugs.

Quest 7.0 provides more than the basic animation capabilities. For example it permits multiple animations and animation of animated objects. There is also a wide choice of dissolves that can be used. Quest 7.0 is also multi-tasking which means among other things that multiple special effects can occur at the same time like the multiple animations mentioned above. So, an animation can occur with other animations or with a video or audio recording. The fact that Quest 7.0 is a 32 bit implementation means that the speed of complex multitasking activities is optimised.

An important element of Quest 7.0 is the inclusion of ActiveX support. This allows training materials developed in Quest 7.0 to include tools from other suppliers. This can be particularly important when the training includes streamed audio or video but is of wider applicability. It also means that courses or small 'bites' of training can be included in other software applications. Just-in-time training can thus be readily supported when the host application is also ActiveX compliant.

Price Range B

There is no additonal charge for distributing courses developed using Quest 7.0.

Contact UK

OP&S Ltd,
16 Narborough Wood Business Park, Desford Road, Enderby, Leicestershire LE9 5XT
Telephone +44 (0) 8700 754 907
Fax +44 (0) 116 238 6881
Email info@ops.ltd.uk
Web site http://www.ops.ltd.uk

Contact USA

Mentergy, 5 Triad Center 5th Floor,
Salt Lake City, UT 84180
Telephone (801) 537-7800
Fax (801) 537-7805
Email info@mentergy.com
Web site http://www.mentergy.com

Quest 7.0 *(cont)*

Support for web-based training is integral and allows courses to be developed for delivery exclusively over the web or as a hybrid course that combines net delivery with other training on CD-ROM.

Courses written in Quest that write data are automatically AICC compliant.

Quest 7.0 allows developers to produce runtime versions of courses. It incorporates verification features to minimise the risk of errors in the delivered product. Embedded fonts are supported to ensure that the correct fonts are available at runtime. No credits are required to Mentergy.

Quest 7.0 is closely linked to Designer's Edge and courses designed using Designer's Edge can readily be converted into Quest format using the tool called Quest Synergy. See the separate entry on Designer's Edge at the end of this part of the report.

Learning management is provided by other products from Mentergy. These are LearnLinc and Manager's Edge. They are described in Part II.

Seminar4web

Runs on

Windows 95, 98 and Windows NT4 or higher. (Versions of Seminar are available that run on legacy Windows 3+ and DOS systems.) The minimum recommended configurations are:

Development
A Pentium 200MHz processor or equivalent with 32MB RAM running Windows 95, 98 or Windows NT 4 or later and 200MB of free space on the hard disk, 800 x 600 resolution or higher, local or network access to CD-ROM required for installation.

Delivery
Any Pentium processor or equivalent with 16MB RAM running Windows 95, 98 or Windows NT 4 or higher, and 10MB of free space on the hard disk, any resolution from 640 x 480 upwards. Seminar delivery system software and courseware modules are very compact, and can be distributed on diskettes, CD-ROM, network, intranet, Internet, or as email attachments. No plug-ins are required for web delivery.

Description

Seminar4web is the latest version of the Seminar multimedia authoring system. This new version means that all the original functionality of Seminar is retained. In addition, all the training and assessment programmes can be run over the Internet or an intranet. "Intelligent templates" enable the trainer to lay out text and illustrations in a WYSIWYG environment. The templates then automatically build screens and responsive interactions that run in Internet Explorer without the need for any plug-ins.

Seminar is aimed at trainers, not computer specialists. The author requires only normal office skills in computer usage – typically the ability to write a straightforward document and save and retrieve it. Authors do not need to be comfortable with computing terms such as variable, parameter, operand and attribute. These make no visible appearance in Seminar as all the programming is done "behind the scenes". On-line help is provided.

Seminar encourages a structured approach to training. The basic model is a sequence of screens presenting information in various ways, and asking the trainee questions to check understanding and reinforce learning. Conditional branching facilities allow courses to self-adjust automatically, catering for trainees of different starting levels.

Using the Seminar Planner window, the author builds up a course by selecting from a range of "intelligent templates" which decide the look and feel and the functionality of each screen. Textual information can be presented in an attractive way. Interactions are built using the templates so that the author can simply enter the question, possible responses and feedbacks. A range of questioning types is built in including multiple choice, true/false, matching block and typed answer. Full multimedia is supported. The intelligent templates enable the author to insert graphics, sound, and video, hot spots and pop-ups.

Assessment tests are created using the same Seminar Planner system. The author selects from the range of questioning styles available, and sets options that control features like score recording and selecting questions at random. Records of test results can be read directly into documents, spreadsheets, or databases for sorting and analysis. They can also be imported into learning management systems.

Seminar does not require or support the use of any programming or scripting language. It achieves its ease of use by offering the author pre-programmed screens and interactions that have been designed to meet real-world training and assessment needs. However, the Seminar's intelligent templates can be modified and added to by "advanced authors" who are looking for additional flexibility in their courseware design.

Runtime versions of the software can be freely distributed within the purchasing organisation. Check the exact terms with Information Transfer.

Price Range **B**

Corporate licence are available.

Contact UK

Information Transfer Limited,
Burleigh House, 15 Newmarket Road
Cambridge CB5 8EG
Telephone +44 (0) 1223 312 227
Fax +44 (0) 1223 310 200
Email mail@seminar.co.uk
Web site http://www.seminar4web.com

ToolBook II Assistant 8 and Instructor 8.5

Runs on

The minimum recommended configurations for both products are:
IBM compatible PC running under Windows 95, 98, ME, 2000, XP (not Assistant) or Windows NT4.0 or later with a Pentium 233 MHz processor with 64MB RAM (128MB for authoring), VGA graphics capable of displaying 800 x 600 resolution with 32,768 colours, CD-ROM drive and 300MB of space on the hard disk.

Internet or intranet delivery
Internet Explorer 4.0 or later or Netscape Navigator 4.0 or later is required. Courses can either be delivered in DHTML format or a standard ToolBook II course for CD-ROM delivery can be viewed over the web using the Neuron plug-in that can be downloaded from the click2learn web site.

Description

Assistant is designed for those who do not require the more sophisticated features of Instructor. It is designed to support delivery of the training over the Internet as well as using CD-ROM and directly on a PC.

Book Specialists are provided to take the developer through the initial process of producing the framework for the course which ToolBook refers to as a "Book". The structure is built up from a group of related templates that cover basic navigation, backgrounds, buttons and page types such as table of contents, main training pages, glossary and tests. Once the course structure has been specified the Assistant's Toolbar is used to build the content for individual frames (pages) and Assistant provides a Catalogue containing over 1000 objects of different types that can be included on pages. The objects can be drawing objects, navigation objects, media players and assessment objects. Assessment objects include a number of question types such as multiple choice, fill-in-the-blanks and true/false. Objects can be animated using the built in Path animation utility.

The Catalogue can be extended with special objects which may be of any of the types mentioned above. Existing objects can be customised and then added to the catalogue. An organisation can thus create a series of easy to use objects that meet the organisation's design standards.

Applications developed in Assistant can be enhanced in Instructor, if appropriate.

Instructor is an interactive development system for producing multimedia TBT for distribution over the Internet or intranet as well as the older established methods such as CD-ROM, local area networks and directly on a PC. Instructor is sold as an Internet development system and it aims to make the task of converting courseware into Internet ready products as simple as possible. HTML-based Web pages and Java applets can be produced without the developer requiring expertise in this area. ActiveX controls can also be used.

Instructor includes a range of "widgets" for asking questions, scoring and providing feedback. Hybrid CD-ROM/Internet courses can be developed so that updates to the base application can be delivered over the Internet or intranet. An overview of the functionality of Instructor as a courseware development system follows.

Instructor is an object oriented development system that provides hypermedia type linkages. It is a very effective presentation system and uses the metaphor of an electronic book so that an application is a "book" that contains "pages" that can be linked in various ways using hyperlinks. Development of books is carried out using the Windows environment to build pages of text, animations and graphics. Instructor includes a graphics editor but various picture formats are supported so that illustrations and diagrams can be imported from other packages as can digitised images. Buttons, icons, etc. can be included to help users to select options.

There is an Actions Editor which is a visual programming tool. It allows developers to add sophisticated functionality to their courseware without using a programming language. The Actions Editor supports button clicks, page loading, item selection, keyboard presses and web functions. The Actions Palette allows actions to be dragged and dropped into the actions sequence.

Price Range **A** for Assistant

B for Instructor

Contact UK

click2learn.com
225 Marsh Wall, Docklands, London E14 9FW
Telephone +44 (0) 207 517 4200
Fax +44 (0) 207 517 4201
Email sales.europe@click2learn.com

Contact USA

click2learn.com Inc
110-110th Avenue NE, Suite 700
Bellevue, WA 98004
Telephone (425) 621 0501
Fax (425) 637 1504
Email sales@click2learn.com
Web site http://www.click2learn.com

ToolBook II Assistant 8 and Instructor 8.5 *(cont)*

Instructor provides a large selection of backgrounds and several thousand scaleable clipart images but, more importantly, it provides a variety of useful drag and drop "widgets" to support presenting questions, analysing answers and presenting feedback. Question types supported include multiple choice, drag and drop, fill-in-the-blanks, matching blocks, slider controls and true/false. Widgets can be modified to suit the specific requirements of a development team and added to the widget catalogue. Selected widgets can be saved in a hotlist so that they are easily accessed.

Instructor provides a useful set of attractive buttons and images that can be built into users' applications. It has a powerful programming language called OpenScript that provides considerable flexibility for developers when it is needed.

The normal multimedia devices such as sound cards, CD-ROMs and videodisc players are supported and the combination of easily included standard features plus OpenScript for special requirements provide a lot of flexibility.

Instructor has extensive database capabilities and includes Paradox and dBase III database engines. ToolBook Database Connection is an optional add-on that provides an interface to all ODBC compliant databases.

Instructor is a very sophisticated product with many features designed to make the job of the developer easier. These range from the support for multimedia features to the production of runtime versions of courses for distribution. Nevertheless it is quite easy to get started with the products although any advanced use will require a knowledge of OpenScript.

The philosophy behind Instructor differs markedly from some of the other popular Windows authoring systems such as Authorware and Quest. These systems use the concept of a flowchart to build a module in contrast to ToolBook's concept of pages that build to form a book. Each approach has its merits.

Instructor comes bundled with a selection of development tools. These include:

- Asymetrix Digital Video Producer for video production
- Sonic Desktop for developing sound files
- Web 3d which is a 3d development package with features that support Web delivery
- InstallShield Express for making runtime versions of courseware

Standards

Instructor and Assistant are designed to meet relevant standards, such as the standards created and supported in SCORM, AICC, IMS, ADL, and IEEE. ToolBook Instructor and Assistant content can be launched, bookmarked, and tracked using SCORM or AICC. Instructor and Assistant support SCORM 1.2.

Trainersoft 7

Runs on

Development
IBM compatible 75MHz Pentium PCs with16MB RAM running Windows 98, 2000 or XP

Delivery
IBM compatible PCs with Windows 95, 98, Me, 2000 or XP. For web delivery Internet Explorer 4.0 or later or Netscape Navigator 4.0 or later is required.
No plug-ins or downloads are needed for delivery over the Internet or intranets.

Description

Trainersoft is designed to be an easy-to-use authoring system based on the book-chapter-page metaphor. The author creates a new book and gives it certain properties, which can affect the look and feel of all the pages in it. Courses can be prepared for either web, network or CD-ROM delivery. The Course Wizard can be used to start from scratch or to convert any previous training. Existing training documents can be imported from the web or from applications such as Microsoft Word and PowerPoint.

Trainersoft comes in two versions – Express and Professional Edition. Professional Edition has all the features of Express with extra functionality.

Trainersoft Express includes the features described next.

Each electronic-book has a table of contents. Readers can view this at any time whilst reading the book if the trainer permits it. As pages are added to a book the contents section is updated automatically. The author has the ability to alter the order of pages and chapters or even hide sections from the reader by altering the table of contents in the table of contents editor. There is no requirement for authors to do any programming or scripting.

Trainersoft has over 200 pre-designed page templates where the author can simply add the necessary text and graphics. Custom templates can be created to suit the company's style. User interactions and question types are created by selecting the appropriate template and entering the feedback and responses. The question types supported include:

- Multiple choice
- Multiple – Multiple choice
- True/false
- Fill-in-the-blanks
- Hotspots
- Matching (Professional Edition only)
- Ordered (Professional Edition only)

Randomised tests can be created easily.

Buttons for common tasks such as navigation and help are available as part of the templates, but they can be turned off by altering the book properties. Customised buttons can be created and added easily. There are also buttons supplied for playing multimedia. All actions are performed using dialog boxes, so there is no need to use any scripting.

Over 1,000 royalty free professional images, over 100 audio and over 10 video clips are included.

Students can send emails and link to web pages and chat groups from within a Trainersoft course.

There is extensive support for hypertext so that clicking on a word or phrase can launch other pages, bring up a small text box, display extended information, launch other applications, display multimedia or behave as the answer to a question.

Price Range | A | for Trainersoft Express
| B | for Professional Edition

Contact UK

Trainersoft EUROPE, Mowbray House,
58-70 Edgware Way, Edgware,
Middlesex HA8 8DJ
Telephone 020 8958 8959
Email info@trainersoft.co.uk

Contact USA

Trainersoft Corporation,
Corporate Headquarters
4020 West Chase Boulevard,
Westchase 1 Suite 400, Raleigh NC 27607
Telephone (919) 754 0000 or (919) 754 9900
Email sales@trainersoft.com
Web sites http://www.trainersoft.co.uk &
http://www.trainersoft.com

Trainersoft 7 *(cont)*

Hot spots can be placed on pictures. If the reader clicks on one of these hot spots the same actions as for hypertext or buttons are performed.

Trainersoft has extensive support for the Internet. Using the Distribution Wizard, books can be exported for delivery via the Internet either by downloading entire books or by exporting them as HTML. Electronic books and the supporting media can be put anywhere on the Internet and they can be accessed using URLs.

The **Professional Edition** generally provides more of most things. For example, it provides more image transitions; it includes over 3,000 royalty free images, over 500 page templates and so on. In particular, it provides better multimedia support and a screen capture tool. It also supports bookmarking and provides facilities for recording usage and student performance data which are limited in Trainersoft Express.

There is a performance reporting and tracking facility called **Access Manager** that manages access to courses and tracks the performance of students over the Internet or intranets, on desktop PCs and on networks. It includes over 20 Microsoft Access management reports. It can store extensive information on users including test answers. Access Manager links to Trainersoft Manager if that is installed. See the entry for **Trainersoft Manager** in Part II.

TX-Authoring

Runs on

Development & delivery
A minimum configuration of an IBM personal computer or compatible with 32MB of memory, Windows 3.1 or higher and VGA graphics.

Description

BYG Systems market three versions of TX-Authoring. The Elite version is a full interactive multimedia development system. Classic is a cut down version of TX-Authoring Elite designed to permit rapid development of interactive multimedia presentations without the sophisticated functionality usually needed by professional multimedia production houses. TX-Authoring Classic LE is the low cost entry level version for those unfamiliar with authoring systems.

We describe TX-Authoring Elite.

This is a powerful Windows based authoring system designed to allow trainers with little computer expertise to develop multimedia based training, marketing and information packages. By the extensive use of icons it can shield the developer from the underlying script language. The script language is, however, available to the more technical users who may need access at that level.

TX-Authoring allows flexible design of the layout of the screen. Different objects which may be text, graphics, images, animations, etc. can be placed independently on the screen. Users can also develop text, graphics and animations using other Windows applications such as Word, PhotoShop or 3D Studio and import the results into TX-Authoring. Courseware can be developed to interact directly with other applications using Dynamic Data Exchange (DDE) and calls to DLLs. TX-Authoring also has a sophisticated effects engine for graphics and animations.

Interactions are handled by the use of assessment templates that support various types of questioning techniques including multiple choice and open ended questions. Graphical interactions are well supported with buttons, slide bars and the facility for the developer to define hot spots that can be irregularly shaped.

A powerful feature of TX-Authoring is its provision of mathematical and scientific functions. These functions can be combined into complex equations that can then readily be plotted as graphs. This makes the development of courses covering various technical topics easier.

TX-Authoring supports all of the standard multimedia PC functions. It is an effective tool for developing multimedia information systems within organisations and at the point-of-sale.

Applications developed using TX-Authoring can be delivered using runtime versions of the software that are royalty free.

Price Range   B

For TX-Authoring Elte and TX-Authoring Classic

Contact UK

BYG Systems Ltd, 1-2 William Lee Building, Nottingham Science & Technology Park, University Boulevard, Nottingham NG7 2RQ
Telephone +44 (0) 115 925 2221
Fax +44 (0) 115 922 3496
Web site http://www.bygsystems.com

A support package for training design – Designer's Edge 4.0 Enterprise

Runs on

IBM compatible PCs capable of running Windows 95, 98 or Windows NT 3.5 or Windows 2000. The minimum recommended configuration is a Pentium 266 MHz processor with 32MB RAM, SVGA graphics and a CD-ROM drive (a Pentium 266 MHz processor with 64MB RAM is recommended). Designer's Edge runs with various word processors for document creation but is designed to work best with Microsoft Word.

Description

Designer's Edge is not an authoring system. The firm that produces it, Mentergy Communications (who also produce the Quest authoring system described earlier and LearnLinc and Manager's Edge described in Part II), describe it as pre-authoring software for instructional design. It is a support system and productivity tool for designers of technology based and classroom training.

Designer's Edge supports users throughout the design process which is based on the widely used instructional systems design methodology. Designers are led through the analysis, design and development steps with attractive maps and diagrams. Wizards and extensive help provide guidance through each step. Expert and novice designers are supported.

As the course develops a visual course map is constructed. Its structure can be viewed and amended using a map on the screen. Designer's Edge generates imported documents for review including training needs analysis, audience profiles and script storyboards. The storyboarding tools allow the designer to create a mock-up of the frames, write the script, specify interactions, determine the media elements to be included and set up the relationships between frames. There are many templates that can be used in developing scripts.

Reporting is well supported and company standards can be incorporated into the Designer's Edge objects. Reports can be exported in a number of formats including Word, Excel and HTML.

Wizards can be customised either by developing them from scratch or by modifying existing ones. This may be particularly relevant to larger organisations where tailored wizards can be used for specific functions and for producing tailored reports. This allows consistency between courses and design teams.

The natural outcome of producing the storyboard in Designer's Edge is to produce the actual training using an authoring system. Designer's Edge supports the Synergy products from Mentergy. Net Synergy will convert the outputs of Designer's Edge into HTML and Java code so that the courses can run over the web or a corporate intranet. It is available for a charge. Quest Synergy is freely available to facilitate the use of Designer's Edge output in the Quest authoring system. It converts the Designer's Edge output into Quest format so that it can be edited and distributed as web-based training and/or on CD-ROM. By using OLE, design data can be exported to other authoring systems and to other applications.

Designer's Edge creates a central re-usable design repository of video, graphics, audio, and design files.

Designer's Edge also supports the development of classroom training. So, a single source can be used to produce training in a number of formats. Updating is carried out on the single master resource.

Multiple Designer's Edge databases can be merged into one, allowing for better standardisation and more efficient working. There is a search capability that supports searches across multiple projects. This can also be used for rapid updating of, for example, corporate information.

Customisable Internet access is available through a URL task.

Once a course has been authored Designer's Edge provides tools to support the evaluation. There are pre-built data collection forms designed to meet the standard needs of all stages of testing and evaluation. It also provides a report wizard to help with the production of a final evaluation report.

Price Range B

Contact UK

OP & S Ltd, 16 Narborough Wood Business Park, Desford Road, Enderby, Leicestershire, LE9 5XT, UK
Telephone 08700 754 907
Fax (0116) 238 6881
Email info@ops.ltd.uk
Web site http://www.ops.ltd.uk/

Contact USA

Mentergy, 5 Triad Center 5th Floor, Salt Lake City, UT 84180
Telephone (801) 537-7800
Fax (801) 537-7805
Email info@mentergy.com
Web site http://www.mentergy.com

Designer's Edge 4.0 Enterprise *(cont)*

Designer's Edge supports a variety of report formats including Crystal Reports, RTF format and reports created in other packages such as Microsoft Word and Excel.

Designer's Edge is a server-based implementation with additional features. It supports group working by making relevant data readily accessible to team members. All the training developers can be on-line at the same time sharing information. Designer's Edge Enterprise enables an organisation to maintain standards across the development team so that there is a consistency and house style between different courses. It supports database systems such as Oracle, Sybase and Microsoft SQL Server.

Designer's Edge 4.0 Enterprise Edition has a number of enhancements that include:

- **Enhanced Template Support for Classroom Training** – From within Designer's Edge 4.0, you can set up templates to match your style guide. Templates can now be created in several formats, including .doc, .dot, or HTML files. This makes it easier to create a customised look and feel for Lesson Plans. Various formatting standards can be pre-set into the templates to make them as robust as needed.

- **Enhanced Document Support** – Word documents can now be viewed, such as stand-up training lesson plans, directly inside the Designer's Edge course map. This improves productivity by allowing everyone on the development team to work within the same interface, following the same standards. Lesson plans can be seen and assembled in the same interface that you use to analyse needs, create objectives, outline content, and perform other functions in Designer's Edge.

- **Supports MS Word as Primary Editor** – All the power and functionality of Microsoft Word is available as you create and format lesson plans. That includes Web hyperlinks, inserting graphics, and applying detailed style guides (including fonts and column settings).

- **New Lesson Plan Report** – All documents assigned to the course map can be compiled in one document. A Lesson Plan document can now be printed out from Designer's Edge and handed directly to the student. Reports are compiled using the MS Word engine. What you see as you build reports is what you will get. You don't have to clean up the format or add page breaks.

- **Document Repository** – All documents are stored to the Designer's Edge database to allow for the searching and reuse of documents from project to project. This repository can consist of all kinds of elements including documents, individual objects, and lesson plans. Updates can be made once and it updates everywhere. Multiple divisions within a company can store elements in one place. Meta-data tagging is based on course map notes and according to industry standards.

- **Merge Multiple Databases** – Multiple Designer's Edge databases can now be merged into one, allowing you to standardise your efforts and work more efficiently using one integrated database.

Standards

Designer's Edge 4.0 Enterprise Edition is AICC compliant if used with Quest Synergy or Net Synergy.

Part II Learning Management Systems (LMSs)

What is an LMS?

A learning management system is a software package that supports the management of learning in an organisation. This very general definition is deliberate because the LMSs covered in this report range from those that manage resources in learning centres through systems that manage classroom training to those that manage the delivery of multimedia training over local area and wide area networks and the Internet and intranets. It also includes systems that provide virtual classrooms.

Types of LMS

Most LMSs will provide the facilities outlined in the first section below called Standard features of an LMS. The second section lists features that are primarily provided by systems that support classroom based learning. The third section covers features that are relevant to systems that support distance learning off-line such as print based training, video and TBT delivered on a stand alone PC. Section four discusses those features that are mostly exclusive to LMSs that support on-line delivery of training. The last section considers some general functionality that may be offered by the more sophisticated systems regardless of the types of training that they support.

Standard features of an LMS

There are two facilities that any LMS will provide. These are student and course information. Typical facilities to support students and courses are:

- registering students – includes recording personal details and providing a user name and password

- registering courses – records course details such as

  - pre-requisites
  - qualifications that may be obtained on successful completion
  - (notional) study time

- tracking students' progress – this will typically involve recording completed modules, sessions and courses, test results and whether the student has passed or failed. Systems that manage on-line learning will normally have more sophisticated student recording (see the later section on Features of LMSs that support on-line learning).

- costing and charging will be necessary in many circumstances

- reporting – good reporting is essential and the user is often provided with a lot of flexibility in the data that is abstracted and in the way that it is presented.

Features of an LMS that supports classroom training

When managing classroom training the main additional factor that needs to be considered is the allocation and costing of resources. These include:

- timetabling of rooms

- allocation of trainers

- booking of supporting equipment – video projectors, PCs, etc.

- timetabling of students

- reporting, most of which takes place prior to the course and includes timetables, joining instructions, waiting lists and reallocations to later courses, etc.

- A facility that may be provided is email support for communicating with the trainers and those who wish to attend a course.

Features of LMSs that support distance learning off-line

The main additional feature that the support of off-line learning requires is the recognition that courses can often be started at any time and that the study time for each module will vary between students depending on their available time, commitment, etc. Where tutor help is provided this must be supported. Features that such LMSs will support include:

- materials distribution

- allocation of tutors.

Features of LMSs that support on-line learning

This is the growth area with the increasing availability of training delivered over the Internet and intranets. LMSs that support on-line learning tend to be sophisticated and quite complex. Among the additional features that they may support are:

- on-line delivery of TBT – some only deliver their own proprietary courses but most can deliver a wide range of courses (See the discussion of Standards for LMSs in a later section.)

- charging mechanisms for users and methods of paying providers

- on-line conferencing with peer groups

- bookmarking so that students can restart a module where they left it last time they were studying it

- on-line tutorial support

- downloading of support materials that might be either for printing or TBT for studying off-line.

Other functionality that LMSs may support

The features that we are considering here mainly concern the predictive capabilities of LMSs that allow them to help human resource managers and employees with their training plans. These include:

- recommending courses based on an employee's profile and training already completed

- devising training plans for employees who may be about to change their job in the company (Skills gap analysis)

- certification

- identifying trends and the resource implications.

What is e-learning?

There is no standard definition of e-learning so here is one that is generally used in this report:

"E-learning is the integration of technology-based learning materials, support and services to provide flexible learning opportunities using a browser-based system."

This definition is narrower than some but, using the analogy of e-commerce, it seems reasonable to limit it to browser-based systems, i.e. learning delivered over the Internet or intranet.

An interesting paper by Duncan Lennox of WBT Systems (the suppliers of TopClass described later in Part II) called "Managing Knowledge with Learning Objects" describes a complete e-learning solution as comprising three components. Lennox then says:

"These components are the Learning Management Systems (LMS), the e-Learning Content Management System (LCMS) and the Virtual Classroom (VC).

Learning Management System

LMS software products include a database of student records with administration and delivery interfaces for learning. LMS products typically provide functionality such as:

- Competency and skills management
- Skills gap analysis
- Resource management
- Inter-connectivity with VC, LCMS and enterprise applications

e-Learning Content Management System

LCMS software products are primarily responsible for creating, managing, maintaining, delivering and tracking web-based content and provide functionality such as:

- Content migration and management
- Learning Object repository
- Content reuse and adaptive individualised learning paths based on Learning Objects
- Asynchronous collaborative learning via mail and discussion groups

- Testing and certification
- Inter-connectivity with VC, LMS and enterprise applications.

Virtual Classroom

Virtual classroom technology is designed to support synchronous collaboration by allowing a live classroom experience to be conducted over the web. It includes functionality such as:

- Voice over IP (VoIP)
- Video conferencing
- Shared whiteboards, application screen sharing and live feedback
- Archiving of classes as Learning Objects
- Inter-connectivity with LMS and LCMS"

The complete paper can be downloaded from the WBT Systems web site at http://www.wbtsystems.com

These descriptions of components are very helpful. In this report we have included all systems including virtual classrooms as learning management systems. We have not felt able to indicate which systems come under the different headings described in Lennox's paper because many do not fit conveniently into one or another. Where an LMS mainly fits into one category or another we try to make this clear in the description.

Standards and specifications for LMSs

Standards and specifications are necessary because users wish to be able to deliver, and record usage of, interactive training from a variety of suppliers. The courseware suppliers also wish to know how much their products are being used as charges are commonly made based on usage.

There are all sorts of standards and specifications that have been, and are being, developed for all aspects of multimedia training and computer management of learning. We shall concentrate on a few that are most prominent and important today. It is relevant to differentiate between standards and specifications. There are standards that are produced by officially recognised bodies such as the IEEE and ISO. There are also other bodies that develop specifications that are less authoritative. They are, however, produced more quickly than the standards and provide a developing yardstick for developers to work to. IMS, AICC and ADLNet are bodies that produce specifications. Most of the committees communicate with each other and there is extensive industry involvement in these bodies.

The Learning Technology Standards Committee of the IEEE (Institute of Electrical and Electronic Engineers http://www.ieee.org) is the main educational body that can establish recognised standards for learning management in the USA. Most of the groups mentioned below work with the IEEE in developing standards that will be generally acceptable. The IEEE LTSC has 20 groups covering all areas of learning technology. No formal standards on learning management have yet been issued by the committee.

ISO (International Standards Organisation) has a sub-committee SC36 working on standardisation in the area of learning technology. It liaises with the IEEE LTSC.

The time to develop and issue standards is measured in years. The bodies that develop specifications have issued a number and we make reference to what the different suppliers claim for their systems in the section on Standards following the description of each LMS in Part II.

The AICC (Aviation Industry CBT Committee – http://www.aicc.org) has been in existence for many years. It has designed CBT standards for the aviation industry to allow interactive training to be delivered across different hardware and software platforms. Their work includes a model for Computer Managed instruction (CMI) which is currently being extended to cover web delivery of training.

The IMS (IMS Global Consortium, Inc – http://www.imsproject.org) is another influential body based in the USA but with satellite centres in the UK, Australia, Canada and Singapore. It works with educational institutions and software suppliers in the field to define specifications. It has produced specifications on learning objects (learning object meta-data), content packaging, question and test interoperability, enterprise learner information. Details can be found in the Specifications section of the IMS web site. Other specifications are at different stages of development. The IMS groups work closely with the relevant working groups of the IEEE.

ADLNet (Advanced Distributed Learning Network – http://www.adlnet.org) was set up by the US Government mainly to support distributed learning for the military and other government agencies. It has produced the SCORM (Shareable Content Object Reference Model) specification.

CEN/ISSS LT (European Community Information Society Standardization System for Learning Technology – http://www.cenorm.be/isss/workshop) is a European working group that is examining emerging standards and assessing them to see how well they meet the multilingual and multicultural requirements of the European Community. Only where the group deems it essential will they create any new standards.

Microsoft have developed Learning Resources Interchange (LRN) which is an implementation of the IMS Content Packaging Specification (see http://www.microsoft.com/elearn/support.asp).

There is a short section on Standards at the end of most of the descriptions of LMSs that follow. The Standards section describes generally how each LMS claims to meet the current specifications.

Choosing an LMS

When setting criteria for the selection of an LMS the features already mentioned must be considered and included as appropriate. There are, however, other factors that are crucial to the success of selecting and implementing an LMS. The checklist below is, by no means, exhaustive but highlights some of the areas and issues that must be considered. Items on the checklist might usefully be identified as essential, important or nice to have. Items to consider include:

- Does top management know what is planned and are they fully committed?

    – Implementing a large scale LMS will potentially revolutionise the way training is delivered in an organisation, so the implications must be thought through, explained and costed.

- Have you considered the implications for your training department?

    – Classroom training may virtually disappear
    – Trainers will need to be retrained
    – Administration will change

- How will you sell it throughout the organisation? Some of the larger organisations call the new facility a corporate e-University.

- Have clear objectives been set to determine what you expect to get out of the LMS? Have you identified:

    – Which forms of learning it is to support – e-learning, classroom learning, CD ROM learning, etc?
    – Is a virtual classroom needed?

- What is your target audience now and in the future?
- Whereabouts in the country or world is it to be run? Are there language implications if it is to be run throughout the world? Will the user interface need to differ for delivery of the learning to different groups?
- How many learners are to be supported?
- What is your policy on tutor support for learners?
- What is the administrative load?
- How will you charge for the learning?
- What courseware will be purchased from outside?
- What reports will be needed?
- Which standards must be met?
- Is there existing human resources (HR) software being used within the organisation? If so, you may wish to transfer data between the systems.
- Have you identified additional facilities that you need such as skills gap analysis, certification, etc.
- Can the user interface be tailored adequately to meet your corporate or organisational requirements?

- Have you determined with your Information Technology department what they will be able to support? Installing and running an LMS on an organisation's network is a non-trivial exercise. The IT department must be involved. They may well have standards for software that will automatically exclude an otherwise excellent choice. An alternative is to contract with the supplier of the LMS or someone else to run the service for you.

- Has support for the LMS been carefully planned and have relevant people identified? An active LMS will need continuous support so that students get timely responses to their communications, students and courses are registered, reports are printed, etc.

- Have you considered all relevant aspects of security? If on-line payments are to be made there will be tighter security requirements than in some other cases. There are many other aspects to security such as hacking, authority for tutors, administrators and technical support, reliability of testing for certification and so on. Smart Cards and biometrics are increasingly being used for identification.

- What are your development plans?

  - Will you start with a small number of people?
  - Will you concentrate on certain subject areas, for example, Information Technology where there are lots of courses available?
  - Or will you go for a big bang?

- Has the system been costed carefully? The cost of LMSs varies considerably as do the charging mechanisms. There are also considerable internal costs due to the implementation and support mentioned above. Some Internet and intranet based training is moving towards a usage charge rather than a fixed cost for purchasing the course. It can be difficult to budget for a usage based charging mechanism.

- How good is the support from the supplier? How is it charged?

- What is the policy on upgrades from the supplier? Can you accurately determine your costs for the next x years?

- Have you future-proofed your specification as far as possible? For example, if it is not necessary to support Virtual Classrooms at present are you as sure as you can be that you will not need to consider using them in the future? Another example might be that classroom courses are not to be supported at present but are you sure that they will not need to be included in the future?

- Can the potential suppliers that you are considering prove to your satisfaction that they are here to stay? What customer base have they in Europe and worldwide? Can you speak to existing customers? There are mergers and new companies coming to the market all the time. There are many more suppliers in the USA, some of which will be coming to Europe. A merger or takeover need not be to your disadvantage provided you are fully supported when the systems are merged.

It is very important to make the right choice first time. Changing systems in a year or two will be expensive and will probably not go down too well with your learners and other users of the system. However, the market is in a state of flux and this makes it very difficult to be sure that you are making the best choice.

An alphabetical list of learning management systems

On the following pages we list a number of learning management systems that are available in the UK. There is a very large difference in the facilities that they offer and the requirements of users can also vary considerably. For these reasons we have not attempted even to give indicative costings.

The entries in this part of the report are based on information provided by the suppliers of the learning management systems. It is intended to be factual; it does not attempt to review the systems in a subjective way. The information is being regularly updated and PeakDean Interactive Ltd will be pleased to hear of any new developments or new learning management systems that should be included. Please make initial contact by email to Christopher Dean at christopher.dean@peakdean.co.uk or telephone on 0114 268 3700.

▰ Aspen 2

Runs on

Servers

click2learn provide a hosted service as well as selling Aspen to run on a customer's somputers.

Web Server	Database Server
A server running Windows 2000 Server and IIS 5.0	A server running Microsoft SQL Server 7.0 with Service Pack 4 or SQL 2000 with Service Pack 2 on Windows 2000 Server, Oracle v8.1.7 or 9.i on Sun Solaris Pentium 500 MHz processor with 256MB RAM and 1GB of disk space running Windows 2000 Server with connectivity to an SMTP mail system

Users

Learners	Authors
Require Internet Explorer 4.0, 5.0, 5.5 or 6.0 or Netscape 4.7 or 6.2 on Windows 98, NT 4.0, ME, Windows 2000 and Windows XP. (Netscape is not supported with Aspen Learning Content Management System) With Aspen Virtual Classroom Server users also require a full duplex sound card and a microphone or headset.	Require Internet Explorer 5.5 or 6.0 on one of the same operating systems with Microsoft Word 2000 or Word XP and PowerPoint 2000 or PowerPoint XP.

Description

Aspen comprises three products – **Learning Management Server (LMS)**, **Learning Content Management Server (LCMS)** and **Virtual Classroom Server**. They can be used together or separately depending on a customer's requirements. Within these products LMS and LCMS offer a number of optional modules so some of the features outlined may not be part of the core products.

Aspen Learning Management Server (LMS)

Aspen LMS is an enterprise learning management platform that enables customers to manage and deliver various types of courses and learning activities including self-paced online courses, classroom training, threaded discussion forums, and synchronous learning integration using Aspen Virtual Classroom Server or other virtual classroom software such as Centra or Interwise (See descriptions later in the report). LMS also supports competency management, skill gap analysis and 360 degree assessment. All learners and managers of the LMS access it through a web interface. The course administrators access the LMS through a client-side application.

Aspen LMS:

- provides a personalised interface to learners supporting, for example,
    - adaptive learning based on pre-tests and the learner's progress
    - context sensitive searching on data that matches the learner's profile
    - dynamically created study plans.

- includes extensive reporting and analysis down to a detailed level.

- automatically keeps a skills inventory for every employee. The data that is held can then be used to identify training needs against skills inventories and for certification and regulatory compliance.

- can work with an organisation's existing Enterprise software such as PeopleSoft, BAAN or SAP through the use of an XML based tool.

- is e-commerce-enabled. The e-commerce support includes integration with CyberSource to process credit card purchases. Users are prompted for this information upon launching a chargeable course.

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Aspen 2 *(cont)*

- supports e-learning courses created using Aspen LCMS, ToolBook, Dreamweaver MX with CourseBuilder and other courses that comply with the AICC and SCORM standards (see the entries in Part 1 for ToolBook and Dreamweaver MX with CourseBuilder).

- supports the delivery of CBT courses and allows offline course delivery and tracking.

- through an optional Auditing module LMS provides auditing functions that can be used to monitor compliance for regulatory testing.

Aspen Learning Content Management Server (LCMS)

Aspen LCMS is system that supports the rapid development, management and delivery of learning and support materials to users who can be employees, customers and others with a need for the information.

The **development** support provides a collaborative authoring platform that enables an organisation to create interactive, personalised, standards compliant courses. It is a wholly web-based, multi author content development tool. All users of the **Aspen LCMS** access it through a web interface. There are several tools and features that support standardisation and productivity. These include:

- an extensive library of professionally designed instructional templates that support a range of question types including some more advanced features such as drag and drop, hotspots and advanced multiple choice questions where the order of the choices can be randomised. The templates provided can be customised to suit the needs of an organisation. There is also a software development kit that allows the authoring team to develop their own templates that can include tutorials with a variety of interactions, simulations and assessments.

- Aspen Simulation Editor is an optional module that includes ToolBook Instructor 8.5 as the Simulation Editor but also provides all the other training capabilities of ToolBook Instructor (see the description in Part 1).

- the use of Microsoft Word and PowerPoint as standard tools for offline development.

- support for a wide variety of media files, including sound, animation, digital video, streaming media and still images. Flash animation files are supported as are many of the popular graphics file formats including GIF and JPEG.

- the use of learning objects that can be reused in different courses.

- question pools that contain subsets of different question groups so that tests can be randomised. Answers to questions are encrypted for greater security.

- incremental publishing, which allows changes to be made to a course without affecting any of the user data that is collected.

- standards-based content that allows learning and support materials developed using **Aspen LCMS** to be delivered on **Aspen LMS** and any other standards-based learning management systems.

Aspen LCMS is designed to permit authors to work rapidly in teams by providing project management so that instructional designers, subject matter experts, media developers and quality assurance personnel can work together effectively.

Aspen LCMS also provides a personalised delivery platform that enables organisations to deliver courses and support materials developed using **Aspen LCMS**. It also enables knowledge exchange through expert communities.

Aspen LCMS is designed to make the learning experience of individuals match, as far as it can, their individual needs at any time. The way **Aspen LCMS** supports users is based on such information as course track taken, time commitments and test results. Learners see a personalised study schedule, receive emails prompting them if they begin to fall behind and current data on their progress. All this data is maintained dynamically so that it is always up to date.

Knowledge exchange is supported by encouraging learners to share relevant information such as study aids, references and web sites. Learners can also have access to designated experts and be able to scan through previous answers by experts to questions asked by other learners.

Aspen 2 *(cont)*

Aspen Virtual Classroom Server

Virtual Classroom Server can be used to provide live synchronous training. It is a comprehensive virtual classroom system that provides multi lingual facilities. The features include:

- Shared whiteboard
- Public and private messaging between participants
- Access to content experts during a class and after the live session
- Application sharing
- Breakout rooms & learning labs
- Chat facilities and other methods of providing interaction with learners
- Support for voice and video over IP
- Session scheduling
- Automatic notification to participants
- Pre-recorded content can be delivered efficiently
- Sessions can be recorded, edited and made available to others who may not have been able to participate in the live session.

Standards

Aspen LCMS can create course packages in AICC and SCORM formats to work with any AICC/SCORM compliant LMS. Similarly, the Aspen LMS supports launching and tracking of any AICC or SCORM compliant course.

Aspen LCMS conforms to IMS Packaging specifications, therefore courses created with **Aspen LCMS** can be published to any IMS-compliant system. The system can also be integrated with AICC compliant learning management systems, which will track courses delivered with **Aspen LCMS**.

Aspen supports AICC (JavaScript and HTTP) and SCORM 1.1 and 1.2.

In addition, ASPEN LMS is FDA CFR 21 section 11 (data auditing) compliant.

Blackboard e-Education Suite

Runs on

Server

The following requirements are for 3000 or less users. Please contact Blackboard directly for specifications for larger user requirements.

	Database server	Web server
Windows NT 4 server	SQL server 2000 or SQL server 7	Microsoft Internet Information Server
Windows 2000 server	SQL server 2000 or SQL server 7	Microsoft Internet Information Server
Red Hat Linux 6.2	MySQL server included	Apache web server included
Solaris 2.8 server	MySQL server included	Apache web server included

Client

Windows 95, 98, 2000 and NT.

Description

The Blackboard e-Education Suite is aimed primarily at the education market at all levels including Higher Education and Further Education. Blackboard also has clients in the corporate and government markets. It is one of the major systems used in education in the USA and is widely used in the UK. The suite is comprised of three interoperable, yet independent, systems: *Blackboard Learning System*, *Blackboard Community Portal System*, and *Blackboard Transaction System* (not currently available outside the USA).

Blackboard Learning System

This is a Web-based server software system that offers course management, customisation and integration with student information systems and authentication protocols. Whether locally installed or hosted via Blackboard ASP Solutions, the main features are **Course Management**, **Building Blocks Architecture** and **Advanced Integration and System Management**.

Course Management

There are four primary parts to Course Management. These are *Content Management*, *Communication*, *Assessments* and *Control*.

– **Content Management**
Instructors can make learning materials available to students. They can author basic content items through the form-based Blackboard interface or incorporate existing instructional content by uploading the files into the course Web site for online delivery. Users can upload and deliver a large number of file formats through Blackboard, e.g. Microsoft Office, Adobe Acrobat PDF, HTML, digital images, digital audio/video files, multimedia (Flash, Shockwave, Authorware).

– **Communication**
Students and instructors have enhanced collaboration with asynchronous discussion boards and synchronous chat tools. Forums are an important part of communication in *Blackboard Learning System*. Users can manage participation by sorting messages according to author, date, or subject. They can track read and unread messages and collect multiple messages onto one page for easy reading. Students can be given administrative responsibilities, locking messages so they can be viewed but not modified and creating archives of past messages.

– **Assessments**
Instructors can customise lessons by creating quizzes and surveys. Instructors can mix and match question types: multiple choice, true/false, ordering, fill in the blank. Instructors can create question pools that can be shared across courses.

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Web site http://www.blackboard.com
A useful specific address is:
http://products.blackboard.com/cp/bb5/orientation/index.cgi

Blackboard e-Education Suite *(cont)*

– ***Control***
Instructors can monitor, control and customise their course web sites all from a web browser. Courses can be managed though an easy-to-use course control panel. The instructors can easily enrol/un-roll students or they can give students enrolling power. For example, limited-time self-enrolment, i.e. certain dates only for self-enrol feature and password-protected enrolment.

Building Blocks Architecture

Blackboard Building Blocks programme centres on an open platform architecture which enables clients and other third-party application developers to seamlessly integrate tools, content, and applications with the Blackboard platform. Examples of currently available Building Blocks system extensions include:

– ***Bantu Instant Messenger***
This web-based Instant Messenger will allow students, instructors and faculty to communicate at an instant, and lets instructors easily create curricular study groups

– ***Blackboard Link Checker***
With this tool, instructors can validate the Web links within the External Links area of their course.

– ***Blackboard to Go***
This is for synchronising Blackboard course data with a handheld device (Palm OS or Microsoft).

Advanced Integration and System Management

This addresses a key problem which can be found in e-Education. As institutions adopt a virtual learning environment (VLE), often the rapid adoption becomes an administrative challenge. Regardless of the size of the institution itself, the large scale usage requires an infrastructure that permits data integration and customisation to allow operational system management. Blackboard provides a comprehensive platform that can be readily integrated with an institution's business and administrative software systems. Examples of these administrative systems are SITS, Capita, SCT Plus 2000, SCT Banner 2000, PeopleSoft 7.6, Datatel 16, LDAP and Kerberos. Blackboard claims to be able to integrate with any student information system (SIS) or Enterprise Resource Planning (ERP) system, including custom/proprietary systems. Data integration can be achieved through the snapshot tool, which allows users to schedule periodic data transfers.

Blackboard Community Portal System

The personalised community environment allows institutions to aggregate important information for faculty, students and administrators. All users are presented with information and experiences to match their individual roles at the institution. The Blackboard Community Portal System includes an intuitive six tab interface that provides students and other members of the faculty with easy access to the key areas of the institution. The six tabs are My Institution Entry Page, Courses, Community, Institutional Services, Academic Web Resources and Web Services.

My Institution Entry Page

This acts as a centralised start page. The My Institution Entry Page serves as a personalised gateway to courses, announcements and Web-based email. This is where a user can see courses they are enrolled on in the My Courses section as well as additional extra curricular modules such as My Calendar, financial news and headline news. One additional option is the Blackboard Web-based email which provides email to both institutional and remote mailboxes by linking with the institutional or remote POP functionality.

Courses

The Courses tab on the My Institution Entry Page provides students with an entry point to courses in which they are enrolled or are teaching. Course catalogues can be delivered in a variety of formats such as links to an existing web page or as a PDF file within Blackboard. There is an extensive choice of academically related modules (Such as My Courses, My Organisations). Institutions can incorporate modules in two ways. They can select from more than 100 Blackboard modules or create up to 14 institution specific modules (two per user role) with URLs or HTML. Through the Blackboard community portal, students have direct access to all courses. All course announcements are aggregated on the My Institution page for easy viewing. The Blackboard portal conveniently facilitates communication between all campus constituents regardless of their physical location, for example the Alumni Office may wish to remind all students of planned social event. They can do this on the Institution Entry Page.

Blackboard e-Education Suite *(cont)*

Community

This extends the portal capabilities of the Blackboard platform by allowing students to participate and interact in multiple curricular and extracurricular clubs and activities. The community environment provides students and instructors with direct access to the clubs and organisations to which they belong as well as related discussion boards and chat areas. Institutions can post an online catalogue of all organisations. All campus constituents can create online components for their clubs.

Institutional Services

The Services tab provides an interface for multiple administrative links and resources. An example of a service that can be provided on this tab is University Administration, which could include policies and procedures and human resources.

Academic Web Resources

This function is intended to guide students to relevant information on the web. The resource is called Blackboard Resource Center which helps students to find academic resources including full-text articles, daily news, academic Web search capabilities, links selected by college faculty, and interactive communities.

Web Services

With the Web Services tab, institutions can spotlight an existing Web site by launching the site within the Blackboard platform. An example of this would be to provide easy access to the library web site or another popular academic site.

To achieve the full benefits of Blackboard as an e-Education solution, the Blackboard Community Portal system can be integrated with the Blackboard Learning System.

Standards

Blackboard provides interfaces that are supported by industry standards including content specifications and standards such as IMS, AICC, SCORM and Microsoft's LRN.

In particular, Blackboard uses the

    IMS Enterprise specification for data integration

    IMS Content Packaging specification for content items

    IMS specifications for Content Metadata and are working towards full compliance

The next version of Blackboard will support the Question and Test specifications in the IMS Content Packaging specifications.

Blackboard Learning System also supports interoperability with JASIG, Oracle and Microsoft portal technologies.

CentraOne

CentraOne includes two product groups – **Centra Collaboration Products** and **Centra Knowledge Products**. Both products run on

Server	Client
A Pentium 550MHz processor with 512MB RAM running Windows NT Server 4.0, Windows 2000 Server/Advanced Server with Microsoft IIS 4.0 or 5.0 and SQL Server 7/2000 or Oracle 8/8.1.7. Recommended to support maximum concurrent users: Pentium 1Ghz with 1GB RAM running Windows 2000 Server/Advanced Server. 100 Base-T network connection. **NB:** Full-capacity collaboration server and knowledge server products require dedicated hardware.	A PC with a Pentium 133MHz processor and 32MB RAM running Windows 95, 98, NT4.0, 2000, ME or XP with a 16-bit sound card, speakers/microphone running Internet Explorer 4.01 or later or Netscape 4.08 or later. For the broadcasting of multipoint video and application sharing a Pentium 200MHz processor with 64MB RAM is the minimum recommended specification. Bandwidth: Greater than a 28.8 Kbps Internet connection for full-functionality support.

Description of Centra Collaboration Products

Centra Collaboration Products include virtual classroom and business collaboration products. The most relevant product for e-learning is Centra Symposium. It is designed to provide 'live or synchronous' e-learning to all staff in an enterprise, whether interacting over intranets, extranets, the Internet or combinations of these. This replicates typical classroom interactions. It is integrated with various other learning management systems, discussed in this report, 'out-the-box', to provide live e-learning.

CentraOne, in its simplest form, is a single-server solution for the delivery and management of live e-learning and collaboration across the enterprise. This server technology provides capabilities for rapid deployment and streamlined administration of Centra's virtual classroom, web conferencing, and real-time eMeeting collaboration clients. In addition, it is scalable to hundreds of thousands of users, through the CentraOne enterprise deployment architecture and includes tools for centralised system and resource management. The client is deployed by the download of a single 1.2MB client installation, supporting all the virtual environments – Symposium, Conference and eMeeting – through an easy-to-use system check utility. This provides ease of end-user deployment and low cost of ownership.

- Centra Symposium is ideal for highly interactive team collaboration, virtual classrooms, and hands-on training applications. It includes the following features:

  - Audio conferencing and video conferencing using Internet Protocol enable users to participate in conferences over the Internet.

  - Multi-point video conferencing. Participants are able potentially to see others with Internet video cameras installed from within the interface.

  - Break-outs. Session leaders can break the main session into multiple rooms for team or individual lab exercises.

  - Multiple presenters. An unlimited number of co-presenters and subject matter experts can be supported.

  - Feedback. Learners can interact with their presenters in various ways including 'raising' their hands, participating in public or private chats and providing anonymous feedback.

  - Application Sharing/Showing. The session leader has the ability to share applications from their or another computer, and to take control of a participant's application.

  - Assessments and Polling. There are evaluations, quizzes and survey tools which support both testing and increased interaction.

  - Choreography. The environment is dynamic allowing easy promotion and demotion of subject matter experts in the middle of training sessions, as well as support for fully collaborative, unrestricted meeting environments. The leader can open the floor at any time for peer-to-peer interaction.

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CentraOne *(cont)*

- The leader has the ability to use whiteboard tools to mark-up content to emphasise information being presented.

- Dynamic support for up to 12 languages on a single system, allowing users to log in and participate in live sessions in their preferred language.

- Record and Playback. A facility to support minuting of meetings, recording of training sessions, re-use of content, and the generation of industry standard video to ensure that information is future-proofed and transportable.

- CentraOne for Microsoft BackOffice is an optional package that integrates with Microsoft BackOffice, allowing support for asynchronous discussion forums and MS Exchange calendaring functionality.

- Advanced customised integration is supported through the advanced CentraOne API Toolkit, allowing all Centra activities to be controlled by an external application, such as an LMS for e-learning, or an LDAP environment for user authentication.

- Support of multiple reusable content types. CentraOne supports PowerPoint presentations, pre-recorded video clips, audio clips, animated GIFs and other multimedia content. These are assembled using Centra Agenda Builder and are reusable across multiple virtual sessions.

- Asynchronous Content Engine add-on. The Knowledge Catalog (built on the Centra Knowledge Products technology described below) provides capabilities to upload, organise, search, retrieve, deliver, and track self-paced content including Microsoft Office documents (Word, Excel, PowerPoint), Adobe post-script files, third party packaged content, SCORM compliant content, Centra session recordings, and other web-based content. This option is an extension to the CentraOne Collaboration Server. All features are accessed via the CentraOne Collaboration Server web pages.

- Centra Conference enables organisations to deliver live, interactive seminars and corporate briefings over intranets, extranets, or the Internet to large dispersed audiences. It includes many of the features of Centra Symposium and others specifically needed for conferencing.

- Centra eMeeting provides a powerful and easy-to-use virtual meeting facility where users can schedule, organise, and run their own meetings with co-workers, customers, suppliers, partners, and prospects. It includes many of the features of Centra Symposium and others specifically needed for eMeetings.

Description of Centra Knowledge Products (asynchronous)

Centra provides a knowledge management solution with a standards-based content repository to facilitate the capture, storage, delivery, and centralised management of custom and third-party knowledge assets. With capabilities for collaborative authoring, content management, and personalised and on-demand learning programs, Centra Knowledge Products makes it easy to find and re-use relevant content and training materials.

The idea behind Centra Knowledge Products is to divide material into smaller segments which gives greater flexibility and precision in targeting the right mix of information and learning formats for each audience or business task. Learners then only need to study material relevant to their job or business task.

Centra Knowledge Center is an easy to use client interface to the Knowledge Server that gives end users convenient access to personalised, self-service learning programs.

- In addition to notification of organisationally "prescribed" learning activities, this interface provides access to a searchable catalogue of learning resources – called knowledge objects – including documents, simulations, Web content, presentations, live online events and recorded sessions (with Collaboration Server integration) assessments, tests, survey, reports, etc., indexed by type, job role and name.

CentraOne *(cont)*

- The Knowledge Center features easy to use Knowledge Composer wizards that enable any business user to quickly author and publish editable, standards-compliant knowledge objects derived from PowerPoint presentations (via **Centra Knowledge Composer for PowerPoint –** see below) or Web-based content, including threaded discussions, surveys, FAQ's and URL references.

- The Knowledge Center also includes competency management tools, enabling users to participate in self-assessments, conduct skills gap analysis and define prescribed learning tracks to address learner needs.

The **Centra Knowledge Composer** group of products provide a component-based Authoring environment that enables Instructional Designers to create, assemble and organise various media and instructional elements into learning objects. These elements may be blocks of text, graphics, audio, video, animations, assessment items, simulations, or HTML files.

All content, from instructional elements to complete learning tracks, are metadata tagged (conformant to IMS standards) and then stored and managed in the Composer Repository, which is based on a relational database server. This allows for the reuse and recombination of content data as desired, allowing multiple Authors to leverage each other's work. The Composer products are optional add-ons to the Centra Knowledge Center and comprise:

- Centra Knowledge Composer Pro – a set of content composition and resource management tools that enable Instructional Designers to build structured learning objects and learning tracks, design interactive simulations and create assessments.

- Centra Knowledge Composer for PowerPoint – an easy-to-use, desktop application designed to allow Subject Matter Experts to create rich, interactive and web-ready content using familiar PowerPoint format, menus, and templates. Learning objects created by Composer for PowerPoint can be easily uploaded to Knowledge Center or Knowledge Catalog which is a simpler resource management system than Knowledge Center.

- Centra Knowledge Composer for Simulations – an easy to use simulation tool that enables the Instructional Designer to quickly add product and process simulations to learning presentations. It provides the capability to design effective interactive simulations, complete with hotspots and hints.

Standards

The Centra Collaboration and Knowledge products are AICC compliant learning applications, that support the SCORM and LRN content standards and the IMS content tagging standards.

ClassAct

Runs on

Server	Client
A PC running Windows 95, 98 or NT.	A PC running Windows 95, 98 or NT.

Description

ClassAct is a network based management system that works on LANs, intranets or the Internet. It is aimed at the education and training markets.

ClassAct has the following functions:

- Class Manager enables administrators and tutors to create, view and amend student records and course details. It allows creation of learning profiles and learning targets for individuals or groups.

- Profile Manager allows tutors to create course profiles for individuals or groups which will automatically deliver the required content.

- Schedule Manager allows courses to be scheduled for individuals or groups of students either for a single session or on a recurring basis.

- Module Manager allows the tutor to edit modules. Tutors can create modules or tests and assign pass marks.

- Grade/Score Manager allows tutors to view and grade students' work including tutor-marked elements.

- Network Manager allows monitoring of the students in real time. Tutors can access other ClassAct facilities, access automatic warnings of students having problems and send them additional information or study material. Class and individual reports can be viewed and printed.

- Report Manager can create custom reports. Student progress and test reports are created automatically.

- Remote Manager provides the facilities for remote management of competency based distance learning via modem links. The idea of remote management is that it can meet the needs of students who are unable to attend normal class sessions.

Information from other sources can be imported so that third party software and non-computer based training can be used.

ClassCampus is a totally integrated expansion to ClassAct that provides a comprehensive Internet-based learning system with the following additional features:

- Email between tutor and student
- Content Creation Editor
- ClassCampus Central which provides module brokerage and on-line staff training modules.
- Repository for learning material.
- Chat
- Bulletin Boards
- Databases of learning materials
- HTML learning material editors
- Interactive, tracked web-based learning material
- Video conferencing
- Student registration via web pages
- Platform independent client

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Colloquia

Runs on

Server	Client
Colloquia has been developed in Java, and so will run on any Java enabled platform – Windows, Macintosh and Unix/Linux.	Any PC linked to the World Wide Web and using Microsoft Internet Explorer 3.0 **or** Netscape Navigator 3.0 or later.

Description

Colloquia is an unusual learning management system for the Internet in that it is not server based. It has been developed at Bangor University and focuses on the organisational and pedagogical issues facing tutors and students. It provides the tools for these in a client system. Instead of the construction of courses, their content and their membership happening on a dedicated central server, tutors organise this on their own machines and then replicate this structure on students' systems via an email connection. This means that only occasional connection to the Internet is necessary to receive and transmit course information. Most work takes place offline, thus making the system particularly useful in a context where a permanent link to the Internet is problematic.

All a user needs to use Colloquia are an email account and a copy of Colloquia.

Once a course has been structured, populated with resources, and has a list of members, Colloquia provides an environment for group and individual discussions. These happen within the context of a course or module; there is no need to use a separate tool for conferencing, or to use a separate email Inbox. Messages are sent and received within the course folder, and separate conversation threads grow between course members.

Courses (or activities) typically contain learning resources, learners, assignments and sub-courses (or sub-activities), which in turn contain learning resources, learners, assignments, and sub-courses (or sub-activities) and so on. Only the tutor can add, delete or edit course content or structure. However, students are able to set up their own activities that they can control, e.g. as a private study group.

Assignments can be set by the tutor, completed and returned by the learner, commented on and finally marked by the tutor.

Colloquia incorporates a web browser to view learning resources and allows whole web pages (including graphics and other media) to be saved and accessed offline. It also allows other web browsers to be used.

Colloquia is freely available to educational and non-profit organisations. The current release can be downloaded and used freely by commercial organisations. Future releases and extensions are likely to be available to commercial organisations for a fee.

It is easy to create different language versions of Colloquia. Welsh and Dutch versions are currently in use with German, Italian and Spanish versions planned.

Standards

Colloquia has been developed with interoperability in mind, and its data formats are ready to be made IMS conformant as soon as standards are finalised. The IMS Enterprise specification is being implemented allowing interoperability with Management Information Systems; and the Content Packaging and Metadata specifications have also been implemented. These will be released as extensions to the basic Colloquia system.

Colloquia, coMentor and COSE are partners in the CO3 project (http://celt.bangor.ac.uk/co3/index.html) which aims to investigate (by implementation) the use of IMS (http://www.imsproject.org/)specifications/standards in facilitating interoperability between virtual learning environments (VLEs) and between VLEs in one institution and student recording systems in another.

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Web site http://www.colloquia.net

coMentor

Runs on

Server	Client
A computer running Unix **or** Linux and a Web server.	Any PC linked to the Web and using Microsoft Internet Explorer 3.0 **or** Netscape Navigator 3.0 or greater.

Description

coMentor is not a typical learning management system. It has been designed to provide a collaborative learning environment. In particular, it is designed for courses in the arts, humanities and social science areas where debate, collaborative work and text-based resources are central to learning. It is, however, suitable for use in any context where group-based, discursive activities are needed.

coMentor allows teaching staff to build a learning environment that users can access using a browser. It is primarily focussed on facilitating discussions and collaborative work on-line for groups of students. Students can participate in real-time and hold asynchronous discussions. There are also learning tools to support work on projects, essays and presentations. Examples of activities supported include:

- Submission of written work that selected users may read and comment on.

- Hold asynchronous discussions on chosen topics in groups.

- Chat synchronously about material available on the system. It mimics the ability to talk to others in the same room and to page those not present.

- Access to web resources by all users in a resource area.

- Access to web resources specific to an individual's or a group's activities and made available only to them.

- Leave notices for users.

- Send emails from within the system.

CoMentor contains four main areas that support the facilities outlined above. These are:

- The **Entrance Hall** which allows students to "pin up" general messages, announcements and administrative queries on a notice board. Staff read the queries from time to time and respond as necessary.

- The **Resource Area** – This contains course-specific information provided by course tutors. Links can be provided to articles, presentations, other web sites, etc.

- The **Groupwork Area** supports Assessed Groups and Interest Groups.

  - **Assessed Groups** are established by the administrator and only available to registered members and assigned tutors. Within an Assessed Group there is a Discussion Board and also a facility for Concept Mapping which provides a useful tool in the form of a drawing board on which group members can draw concept maps. This is a valuable facility for those who like to present their thoughts pictorially.

  - **Interest Groups** can be set up by any user to elicit discussion on any topic. Membership of a specific Interest Group can be restricted, for example, to a few friends, a seminar group or everyone in the year. Tutors may be included by the person setting up the group as they wish.

- The **Individual Work Area** contains a list of work left by students with their name and a list of those authorised to access it. Work can be added to and commented on by those with access rights. coMentor does not attempt to provide complete on-line courses but rather to enhance existing courses.

The administrator functions cover:

- Managing users – there are student users, staff users and one administrator. Guests can also connect to the Huddersfield coMentor. They have limited facilities.

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CoMentor *(cont)*

- Managing areas – the areas described above come as standard but others can be added. This requires some technical skill as the coMentor interface has to be changed to show the added area(s).

- Logging user activity – user activity within coMentor can be logged. If the user follows links to outside web pages the activity will not be logged, although discussion by a group studying those pages through coMentor will be.

- Managing role-play – coMentor users can assume the personae of historical or other characters for particular exercises.

Standards

coMentor, Colloquia and COSE are partners in the CO3 project (http://celt.bangor.ac.uk/co3/index.HTML) which aims to investigate (by implementation) the use of IMS (http://www.imsproject.org/) specifications/standards in facilitating interoperability between virtual learning environments (VLEs) and between VLEs in one institution and student recording systems in another.

COSE 2

Runs on

Server	Client
A computer running Apache 1.3 and PERL 5.004 **or** Microsoft IIS 4.0 and PERL 5.004 or higher versions. COSE has been tested on NT4, Linux 2.0 and DEC Unix.	COSE uses the Sun Java 1.3.0 or later plug-in. The minimum recommended system requirements for this are any PC running Windows 95, 98, NT, 2000 **or** XP with Internet Explorer 4.0 or higher **or** Netscape Navigator 3.0 or higher. For access from a Macintosh you need a Power PC, G3 or G4 Mac running Mac OS 8.1+ with Apple MRJ 2.2 or later installed. It will also run on SUN Solaris 2.5, 2.6, Sun SPARC or Intel x86 microprocessor.

Description

COSE (Creation of Study Environments) is a system that provides a virtual learning environment designed to provide active and collaborative learning for students. It is designed to provide a learning environment based on sound learning practice and to put the learner at the centre of the activity.

Course developers build courses out of **Learning Opportunities**. These are constructed as Pagesets. Each page in a Pageset is a standard HTML page. Each page can have resources linked to it. For example, media objects are separately viewable resources that can be any web-compatible media or files that can be launched using a local application such as Word or PowerPoint. Theory pages contain subject-specific information. Pages can also contain procedural guidance and hints and tips. There is also an Index that provides links to other relevant resources that are available. Multiple choice tests or self-tests can be built and included. When the learner views a COSE Pageset the window is split into two so that the information that is currently being viewed is seen in the context of the structure of the learning opportunity; the structure is displayed in the left-hand pane. This is an important facility to avoid learners getting lost and to help them to view the learning in context.

Learners create Pagesets to hold their work, which could be anything from a simple attached Word document to a sophisticated set of HTML documents with media imbedded.

Material is imported into COSE using a sophisticated import mechanism based on signed Java Applets.

All users can create private "margin notes" on any page to which they have access. They can selectively share these annotations with any user or group (to which they belong). Tutors can use this same mechanism to provide feedback on student work being reviewed or assessed.

There are COSE tools for tutors and for learners. A common set of tools is called **Management Tools**. There are also **Search** Tools.

The **Management Tools** are described next:

- **Vista** allows users to create folder structures to organise their work. They can view Pagesets in folders in various sequences and at different levels of detail. COSE makes extensive use of icons and there are icons to show whether items are being shared with others.

- The **Group Management** tool provides tutors with a tool to set up and manage Learner groups (Courses) and Tutor groups. This is very flexible and allows the manager to add and remove members, create any number and level of sub-groups, email the group, post notices, chat to group members etc. This facility is available to learners to create and manage peer groups.

- Tutors and Learners are provided with a **Group Membership** tool that displays all Groups and Sub-groups of which they are a member. It is also possible for the learner to see all the Groups and Sub-groups available on the COSE server with those, of which they are a member, highlighted. This tools provides access to a notice board, assignments, email and chat for each group.

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COSE 2 *(cont)*

- The **Group Reports** tool allows tutors to track Pageset usage and Learner Submissions. It can report on how many times a Pageset has been assessed, when and by whom. It gives details of accesses to formal assignments, work shared by tutors with learners, submissions of essays and tests, and which learners have taken self-tests. It reports by Group with details for individual members of the Group also displayed.

- There is a **Published List** option that shows all Pagesets published on the COSE system.

- **Learner Submissions** allows the tutor to organise assignment Pagesets submitted by learners. They can be organised into Groups and Sub-groups. A Certificate of Submission is automatically sent to the tutor and back to the learner when work is submitted. This facility covers both assignments (essays, etc.) and returns from multiple choice tests.

- **Learner Profiles** – This facility allows learners to maintain and annotate a record of their activities in COSE. It records every access of assigned, tutor-shared or published content and all submissions and self-tests.

- Lastly, there is the **Publisher** that can only be used by Supertutors. It is used for quality assurance of Pagesets created by other tutors and, when a Pageset is regarded as satisfactory, to publish it.

The **Search Tools** allow the user to search their own work-in-progress and all published material held within COSE using flexible search criteria. Searches operate from Pageset level down to individual media object. The tools also provide facilities for searching for individual users and group managers and members (but only for those belonging to a particular group).

Selected items of content found using the Search Tools can be put into a Basket and saved for future reference. Only the links to the items are saved. The resources themselves are not duplicated.

In addition to all the features outlined above, COSE 2 also supports:

- **Content Packaging and Interchange –** The COSE Project is committed to conformance with international IMS specifications, and COSE 2.05 features an upgraded Content Packaging and Interchange Facility which uses the IMS metadata specification v1.2.2 and content packaging specification v1.1.3.

- **Publish to CD-ROM –** COSE content can be published onto a CD-ROM. A COSE user can, if working on-line, ask the system to look for content first on the CD-ROM and then on the server. This can dramatically improve access to "heavy" content by dial-in users. The same facility allows off-line browsing of COSE content on a CD-ROM.

The system comes with an Administrator/Helpdesk interface and a comprehensive set of systems management tools.

COSE 2 is a commercial product that is being published on behalf of Staffordshire University by Cambridge Software Publishing (formerly Longman Software Publishing). A reduced feature set version, COSE Lite, will replace, and offer more functionality than, the earlier version – COSE 1.2. It will be available to UK HE and FE at nominal cost.

Standards

The COSE project is committed to conformance with the IMS specifications. As well as the work described above on content packaging, the COSE development team is actively working on conformance with the IMS Enterprise and Learner Information Packaging specifications, including work required for the FE sector requirements.

COSE, Colloquia and coMentor are partners in the CO3 project (http://celt.bangor.ac.uk/co3/index.html) which aims to investigate (by implementation) the use of IMS (Instructional Management Systems (http://www.imsproject.org/) specifications/standards in facilitating interoperability between virtual learning environments (VLEs) and between VLEs in one institution and student recording systems in another.

Docent Enterprise 6

Runs on

Server	Client
Pentium PC with 256MB RAM running Windows NT Server with Service Pack 6a or later, Windows 2000 with Service Pack 2 or Sun Solaris 8 or later. Web servers supported are Microsoft IIS 4.0 with Service Pack 6a on Windows NT, IIS 5.0 on Windows 2000, Apache 1.3.22, iPlanet 4.1, iPlanet 6.0 or other CGI-enabled web servers. Supported databases are Oracle 8.1.7, 9i, Microsoft SQL Server 7.0 with Service Pack 3 or Microsoft SQL Server 2000 with Service Pack 2.	Any hardware platform that supports HTML and compatible web browsers such as Netscape Navigator **or** Internet Explorer. No plug-ins or Java support are needed.

Description

Docent Enterprise supports all types of learning. It comprises a suite of five products that work together as an integrated whole but can be ordered and successfully used separately. These are **Docent Learning Management Server (LMS)**, **Docent Learning Content Management System (LCMS)**, **Docent Live!**, **Docent Exchange** and **Docent Peak Performance**. Docent is designed for easy installation by technical support. Each product is described separately below.

■ **The Docent Learning Management Server (LMS)** supports students, managers and administrators over the Internet or an intranet. Students can view tailored course catalogues, check pre-requisites and enrol on courses that can be web-based, synchronous, instructor led and CBT.

Docent LMS also provides facilities for competence and 360° feedback assessments. Gaps can be identified between a student's competency level and the requirements of their job profile. Personalised learning plans can then be generated by the system to fill the identified gaps. Employees' skills profiles can also be matched to job vacancies.

Managers can review the progress and results of their staff and book them onto courses.

Administrators can register students either individually or as groups, email students with booking details, etc. Management of training resources can be automated including scheduling of instructors, facilities and equipment for classroom courses. Resources can be monitored by usage, cost and location. There is a range of standard reports; customised reports can readily be added.

Docent domains provide organisations with the capability to create an unlimited number of partitions on the Learning Management Server so that users can be grouped into independent domains according to various criteria. This is of particular relevance to large organisations or Application Service Providers where a number of businesses may be supported on the same system but managed as unique customer accounts.

Docent LMS can create, administer, enrol learners in and deliver blended learning programmes that can include:

- live synchronous events (virtual classrooms)
- AICC compatible and SCORM compliant web-based training from a variety of sources
- instructor led courses
- CBT
- external applications using JAVA Beans, native JAVA support and a structured JAVA and C++ API
- collection of the results from all types of training.

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Docent Enterprise 6 *(cont)*

■ **Docent Learning Content Management Server (LCMS)** provides an integrated system for developing, managing and delivering e-learning over the Internet or an intranet.

Docent LCMS provides an easy to use open authoring environment for instructional designers and subject matter experts to develop learning content. Web authoring tools such as Macromedia Dreamweaver MX are supported as are Microsoft Front Page, PowerPoint and Word. AICC and SCORM compliant content can be imported and combined with other training modules to make up courses. The modules that comprise a specific course can be tailored to match the profile of the learner.

The open authoring environment provides tools for creating powerful HTML based assessments and supports a range of question types including true/false, multiple choice, fill-in-the-blanks, image map and unjudged essays. Question pools can be created, questions can be randomised, responses can be timed, etc.

Collaborative team development of courseware is supported.

The results from e-learning courses and assessments can be exported to any AICC and SCORM compliant learning management system, not just Docent LMS.

Docent LCMS can deliver the learning to any browser enabled client that can include PDAs and smart phones. Learners can also be supported who only have limited access to the Internet or the company's intranet. It allows registered users to download courses onto their PC or to receive the courses on a CD-ROM and then study them using their web browser. Student tracking takes place on the student's PC. When the students go on-line to Docent LMS all the recorded data can be uploaded.

Docent LCMS supports the creation and delivery of adaptive courseware that responds "on the fly" to the needs of individual learners. For example, if the system observes that the student is struggling with the quiz questions, the course may branch to more remedial content; conversely, if the system observes that the student is responding correctly and quickly to assessments, the course may branch to more challenging material.

AICC compatible and SCORM compliant courseware can be delivered. This means that a lot of off-the-shelf courseware can be delivered from suppliers such as SkillSoft and NetG.

■ **Docent Live!** is the component that provides a virtual classroom to support live communications over the web. It provides a flexible system so that the user can choose the best model for a specific set of circumstances. Features include:

– virtual classrooms for highly interactive instructor led training

– one-to-one mentoring

– small group meetings

– online seminars that can be delivered live or as recorded sessions and delivered to hundreds of participants

– recorded sessions, for example, from a virtual classroom session so that those who missed a class can catch up.

Docent LMS manages and tracks live and recorded events run using Docent Live and manages tracking of enrolments, instructors, etc. so that Docent Live events can be included as part of a blended learning solution under Docent Enterprise.

■ **Docent Exchange** provides a rapid development environment for subject matter experts to produce training for staff. It makes it easy to include existing materials developed using packages such as Microsoft PowerPoint and Word and Macromedia Dreamweaver MX. Live meetings, speeches, etc. can be captured and included in the learning modules. It provides some of the facilities included in the open authoring environment in Docent LCMS but is more focussed on delivering content than providing interactive learning. Additionally, the value of learning content can be tracked and shared through dynamic ratings, assessments and direct feedback to content creators. Docent Exchange is commonly deployed to accelerate new product launches, improve sales force effectiveness, increase channel revenues, and enhance customer satisfaction. It is designed to aid informal knowledge exchange that fosters the collaborative sharing of just in time information. In executing business strategies, time sensitive information that is initially shared through Docent Exchange often becomes re-purposed into structured courseware that is incorporated into more formal training.

Docent Enterprise 6 *(cont)*

■ **Docent Peak Performance** is a module that helps management to communicate corporate and departmental goals and cascade these down the management structure into group and individual objectives. Templates assist users to set objectives and to track performance. Existing job and industry specific competencies can be used as the basis for measuring the gaps of individuals and departments; suitable training and other methods of performance improvement can then be selected to meet the needs. This module can thus provide a flexible tool for monitoring departmental skills requirements, gap analysis and remedial action to bring the performance and skills up to the required levels.

Docent Enterprise 6 is fully internationalised enabling immediate localisation of the Docent interface in languages of choice including Asian languages. The architecture also provides the framework to address many international issues including multiple currency and tax.

The system provides a platform for interoperation with the broader IT infrastructure including interfaces to other enterprise applications and extended web resources.

In addition to supplying Docent Enterprise to run on client's systems, there is a hosting service.

Scalability and Performance
The architecture of Docent Enterprise is designed to support hundreds of thousands of users through Docent's web-based "n-tier" architecture with distributed web-servers, applications-servers and database-servers. These servers communicate via Docent's distributed architecture and work together as one logical system.

Docent scales beyond the limits of any physical hardware environment enabling the server to support unlimited users.

Standards

Docent fully supports the main e-learning standards.

If is compatible with SCORM 1.0, 1.1 and 1.2.

It supports the development of AICC compliant training and Docent LMS and LCMS can both launch any AICC compliant content and return course results.

Docent supports unlimited meta-tagging in conformance with IMS/IEEE standards.

EASE

Runs on

Web Server	Application Server
EASE web server will run on a wide variety of software platforms. Under Windows it runs on Microsoft IIS, Microsoft PWS or O'Reilly Web site.	Under Windows or Linux it runs on Cold Fusion Professional 4.5.1 or later.
Under Windows, Sun Solaris or HP-UX it runs on Netscape Enterprise Server.	Under Windows, Linux, Sun Solaris or HP-UX it runs on Cold Fusion Enterprise 4.5.1 or later.
Under Windows, Sun Solaris, HP-UX or Linux it runs on Apache Web Server.	ODBC complaint databases are supported including Microsoft Access, Microsoft SQL Server and Oracle.
The hardware requirements vary widely depending on the combinations being considered.	

Client
A PC with at least 800 x 600 screen resolution running Windows 95, 98, NT, 2000 or XP and Microsoft Internet Explorer 5 or later. An alternative is the Macintosh with at least 800 x 600 screen resolution and Microsoft Internet Explorer 5 or later.

Description

EASE is a learning management system that can be used to support e-learning, other forms of distance learning, classroom courses, on-the-job training, etc. It is used by training providers, academic institutions and to support corporate training. It comes as a series of modules. **EASE Campus** provides a platform for the supported delivery of e-learning over the Internet and intranets. **EASE Centre** supports the management of training courses, seminars, etc. and off-line training resources. There is also **EASE Competence** that provides skills gap analysis. Each of these modules can be purchased separately. **EASE Enterprise** combines these three modules and adds some features to make a total learning management system that can be integrated with other enterprise systems.

Each of the modules includes the EASE Report Generator that provides different sets of standard reports for each module. Standard reporting packages can readily be used to produce bespoke reports. Other common facilities include online help and security. There are different levels of security for learners, tutors, administrators, etc.

The individual modules are described next.

- **EASE Campus** is used to deliver e-learning using the Internet or an intranet. The interface that is used by learners and others can be tailored to meet corporate requirements, include company logos, etc. Learners can be grouped together and managed as a cohort. Programme mapping features and a diary system allow blended learning programmes to be set-up. Email support includes email lists, attachments and external email. There can be multiple bulletin boards and users can hold synchronous chats.

  Courses can be delivered online and be sourced widely provided that they are SCORM v1.1 compliant. Tutors can monitor the progress of learners, receive and mark assignments and provide feedback. A question generator is available to design online questions and tests.

  There is also a software package called EasyAuthor that allows content authors to convert course materials written using Microsoft Word to run on the web. Templates are provided that can be used to ensure that corporate standards are adhered to and that the delivery of the training over the web is consistent, automatically incorporating discussion forums, assignments, multimedia clips and testing understanding.

■ EASE *(cont)*

- ■ **EASE Centre** supports classroom and other forms of offline learning. It provides learners with an online course catalogue and learners can register themselves onto courses online. Block bookings and individual bookings can also be made by an administrator. EASE Centre monitors enrolments so that courses do not become overbooked and warns if the numbers are low. If courses are fully booked people can be waitlisted and then assigned a place should there be a cancellation. It can also schedule and manage resources such as tutors, rooms and projectors.

  EASE Centre also enables learners to book off-line resources in a learning centre, e.g. CD-ROMs, workbooks etc.

  The progress of learners can be tracked and attendance and any accreditation is recorded on their learner record.

- ■ **EASE Competence** is a module that provides skills gap analysis so that development plans can be constructed for individuals to help them to meet their career or job goals. Competence profiles can be created for individuals and to match job titles and roles. As a result of an individual completing a competence test they will receive a personal development plan directing them to the appropriate training events for them. The delivery of the training can be supported by EASE Campus and EASE Centre modules if they have also been installed. Evidence of completion, and how well the learner has done, can be recorded and used for certification where appropriate.

- ■ **EASE Enterprise** includes all of the features described above but adds an encompassing framework to make the system a coherent whole for organisational development. It provides links for data import and export so that organisations can link EASE into other enterprise systems. It also supports e-commerce and the ability to charge departments for the costs of any learning that has been delivered to their staff.

Standards

EASE complies with SCORM v1.1.

FirstClass – Version 6

Runs on

Server

Windows	Macintosh
Windows NT Server, Workstation 4.0 (Service Pack 6a recommended) or Windows 2000 Server 12 MB free disk space, plus additional storage for mail and user data (10 – 20 GB recommended) Additional physical hard drive for local software mirroring recommended.	iMac minimum Macintosh system 9.0.4 minimum PowerMac only, 64M-128M RAM, more for busy systems 12 MB free disk space, plus additional storage for mail and user data (10 – 20 GB recommended) Additional hard drive for local software mirroring recommended.

Client

Windows	Macintosh
Windows NT Workstation or Windows 95/98/2000/XP	Macintosh System 7.1 (or later)

FirstClass Server Capacities

Windows NT, Windows 2000 (Hard Drive speed & size primary limiting factors):	Mac OS (Hard Drive speed & size primary limiting factors):
Up to 100,000 users per server, depending on traffic Up to 5,000 concurrent connections (SCSI RAID Hard Drive) 50,000 conferences, mail lists or Internet newsgroups per server	Up to 50,000 users per server, depending on traffic Up to 250 concurrent connections (Mac OS 9, stock Hard Drive) 25,000 conferences, mail lists or Internet newsgroups per server

Description

FirstClass software provides a customisable suite of online communication and collaborative learning tools including conferencing, calendaring and data management for schools, colleges and business use. FirstClass supports and fosters communication and collaboration in a secure online environment designed particularly with learning needs in mind. It integrates communication, collaboration, document authoring, web publishing, content delivery and calendaring tools in one solution enabling educational institutions to set up a thriving on-line learning community for educators, students and parents.

FirstClass is used to streamline communications within and outside of the classroom or organisation. Designed to be easy to install and set up, FirstClass will run on relatively low specification computers whilst ensuring security via a robust message store and access control system through a fully encrypted connection.

Users can either use the FirstClass Client or a web browser to access and edit their mailbox, calendars, address books, forms, electronic files, teaching resources and the collaborative work areas that form part of their online community. This means that individuals do not have to have their own computer as all electronic files and documents can be stored on the central server.

FirstClass 6 has extensive features and comes with an interface and functions that can be customised in a large variety of ways to suit the needs of individual organisations. It is designed for situations where simple email systems are inadequate but the requirements of Microsoft Exchange or Lotus Notes are too complex to manage.

It provides the following functionality for users:

- Sophisticated email including advanced formatting whereby users can incorporate pictures, sounds and video into the body of messages

- Secure, permissions-based asynchronous discussion forums (conferencing) with threaded messaging so users can track discussions easily at a time convenient to them. Users can also communicate with defined groups, e.g. all staff or all Year 11 students, saving paper and staff time on information dissemination

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FirstClass – Version 6 *(cont)*

- Synchronous discussion forums (real-time chat with multiple users)

- Message history tracking where users can see whether their mails or conference contributions have been read

- Access to any educational or training resources that are made available. These can be documents, presentations and interactive learning assignments, tests (the majority of common file formats are supported, e.g. .DOC, .PPT, .WAV, JPG, MPG, etc).

- Email-integrated calendars that feature customisable access as well as reminders of scheduled appointments. In addition to a personal calendar, users can access calendars for shared resources, e.g. Sports Hall Timetable

- Address completion tool makes finding mail addresses within large organisations, or from personal address books, quick and easy

- Professional quality intranet/ Internet publishing on-the-fly. Users can publish online by dragging-and-dropping documents into conferences, without any need for knowledge of HTML

- Automatic notification of messages and calendar events via a pager or mobile

- Compatibility with Palm (and compatible OS) organisers so that users can connect to FirstClass and synchronise their personal data (calendar, address book, to-do list, memo pad) using HotSynch technology

- Customisable online forms that can readily be tailored to meet specific requirements, e.g. lesson plans, target setting and action plans

- Distributed administration, simple permissions setting and post office mirroring for secure round-the-clock back ups

FirstClass RAD (Rapid Application Development) enables administrators to develop database interfaces, integrate existing databases and deliver access to all ODBC-compliant databases. RAD ships with a series of sample applications: FCSurvey for conducting online surveys; Address Import Tool for importing addresses from systems such as Outlook; Quotalarm for alerting administrators when users are near their disk limits; Buddy List for tracking when specific users are online and eTest, a fully-featured test creation and delivery system.

FirstClass IP Notifier means that users can be alerted to new messages without being logged in to the FirstClass Server. FirstClass IP Notifier sends a message and automatically launches the FirstClass Client whenever a new mail arrives.

Standards

Centrinity is targeting IMS specifications.

HP Virtual Classroom

Runs on

HP Virtual Classroom is hosted by HP. Presenters and participants can run HP Virtual Classroom using Microsoft Windows or HP-UX.

Client – Presentation and Participants

200MHz or greater PCs for presenters (166MHz for participants) with 128 MB RAM, high resolution colour, 1024x768 screen resolution and Internet Explorer 5.0 or higher are recommended for presenters and participants. HP Virtual Classroom will run under Windows 2000, XP, Windows NT 4.0 with Service Pack 5 or greater and Windows 98. Windows 95 can be used for participants but the performance will suffer. A 56K modem is the minimum Internet connection that is recommended. Audio via the web is supported with Sound Blaster 16 or greater.

Description

HP Virtual Classroom services provide a hosted online web-conferencing service to support real-time delivery of instructor-led online training and meetings, and collaboration.

Participants sitting at their PCs can "attend" classes and meetings from anywhere in the world via a standard Internet connection. Virtual Classroom can be used continuously or for a one time event or rented monthly. There are obviously different rates for the desired time period with preferential rates given for continuous access. HP Virtual Classroom's functionality means that:

- Participants can work as a group and collaborate on ideas, communicating with both presenters and each other via voice, text, or private one-on-one chat.

- Participants can also ask questions, make comments and use a shared "whiteboard" to illustrate a point to the group.

- Presenters can use anonymous survey tools to check training effectiveness.

Features of the system are:

- HP Virtual Classroom is hosted by HP so the user does not have the problems of providing and supporting the infrastructure.

- Participants have an easy to use interface.

- Presenters have a different view that is clear and straightforward to use for presenting training. Both self-paced and instructor-led training are available for presenters.

- The system is secure with the purchaser having control of their environment through a separate presenter and participant "room keys". SSL-encryption is available as an optional feature.

- Materials and training objects can be re-used for repeated courses.

- Multiple formats are supported for delivering the learning including animated presentations, snapshots, live demonstrations and application sharing.

- Learners can "raise their hands" to ask the presenter questions and have private chats.

- Students can take and print individual course notes.

- There can be shared web links.

- Course materials can be organised and maintained in file folders.

- Up to 500 concurrent users can be supported.

- HP Virtual Classroom can work through firewalls.

- Shareable, multi-colour whiteboard tools are available for presentations and collaboration.

- Real-time polling tools check for understanding or conduct fun and interesting class polls.

Contact UK

Hewlett-Packard Limited, Nine Mile Ride, Wokingham, Berkshire, RG40 3LL
Telephone 01344 763311
Fax 01344 763151
Email hpe_sales@hp.com
http://www.hp.com/uk/education

Contact USA

Hewlett – Packard Company, 3000 Hanover Street, Palo Alto, CA 94304, USA.
Telephone (+1) 650.857.1501
Fax (+1) 650 857-5518
Web site http://www.hpe-learning.com/store/classroom.asp

HP Virtual Classroom *(cont)*

In addition, HP Virtual Classroom offers a wide range of services to help the customer make the most of the system. Services include:

One Time Event Services – Book a room for a special event

One Time Event Services provide the full power of the HP Virtual Classroom hosting facilities to host special training events. As part of the service, the customer is provided with an easy way to book a room, free access to practice within the environment and professional technical support during the event. If the customer needs additional help with preparing an event, assistance during an event, or a recording of an event, one or more of the value added services outlined below can be purchased to further enhance and customise the One Time Event.

There is also **Monthly Rental –** You can book a room by the month for unlimited usage

A **Continuously-Hosted room** provides unlimited usage of the HP Virtual Classroom during the months of the rental. It is possible to hold real-time training, meetings, and collaboration events without travel and with minimal planning. As with a one-time-event, the customer can easily book the room and has free technical support available. Value-added services can be purchased to further enhance and customise the events that are held in the HP VIrtual Classroom.

Value-Added Hosting Services

Value-Added Hosting Services provide a series of advanced options such as event consultation to assist in preparing an event, customised in-room technical support, event facilitation to help deliver an event, setting up phone lines and the option to audio record an event.

Examples are:

- **Event Preparation Services**

- **Train-The-Trainer (TTT)**
  A 4 hour class given by an experienced online training presenter to help a presenter to learn how to deliver online training classes effectively.

- **Event Consultation**
  Experienced online presenters will advise on course development and improve the delivery skills of presenters.

- **Phone Line or Voice-over-IP**
  Provision of an audio conferencing service via either telephone or VoIP (audio through the PC)

- **In Room Technical Support**
  A technical expert can be used to sit with a presenter in the room to help with any technical issues.

- **Online Facilitation**
  An experienced presenter sits with a presenter in the room to help with the delivery of the event. This person can annotate slides, execute advanced virtual classroom features, filter participant questions, and answer questions about the technology and capability. This service is ideal for inexperienced presenters or large group delivery.

HP can also provide services to support the whole development and delivery process for training events. These include:

- Content design, development, and delivery

- Needs analysis

- Integrated/online curriculum mapping/design

- 3rd party integration

- Organisational skills gap analysis.

HP education consultants can help design an education strategy for a project. They will also manage a project from beginning to end, from skills gap analysis and design through to delivery and evaluation.

inClass

Runs on

inClass can run stand alone or networked and will run on PCs under Microsoft Windows and on the Apple Macintosh.

Description

InClass has been developed to support the managers of large training organisations in controlling their training operations. It provides:

- course scheduling

- resource allocation

- bookings

Courses can be scheduled at internal training centres, at customers' sites and at associated company training centres. inClass manages room allocation, books instructors and registers delegates ensuring that there is room on the course when the booking is made. The person taking the booking can check course details, pre-requisites, etc. while taking the booking.

inClass also handles all the administration for courses such as correspondence to delegates and instructors and invoicing.

- **instructor information** – There is a database holding details of all registered instructors including their availability and other courses they are scheduled to run. Information includes the qualifications of instructors, how often they have been used and for which courses, and their agreed rates of pay.

- **sales staff control** – This part of inClass manages the sales activities of staff. Incoming calls can be logged, minuted and follow up calls automatically scheduled. They can also be logged against the customer so that there is a history to be viewed and analysed. All sales activities are recorded so that the performance of each member of the sales staff can be assessed.

- **project roll outs** – If the training company provides a planned range of courses for clients to support the implementation of new projects, inClass can help to plan the training, and schedule staff onto the courses to which they are assigned in the order specified, and ensure that no-one is double booked.

- **product availability** – inClass has a stock control element that can be used to control the issue of products that might be course materials or instructor information, but can also include products that are for sale such as courseware and other training materials.

- **search capabilities** – There are powerful search facilities to allow staff to display information about delegates, companies and instructors.

- **reports** – There are hundreds of standard reports available but custom reports can also be created and saved for future use.

Items Technology produce a range of computer products each of which can integrate with the others. The range includes packages for project management and time recording, human resources management and contact management.

Contact UK

ITD3 Ltd, 4 Bonneys Yard, The Street, Eversley, Hook, Hampshire RG27 0PJ
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Web site http://www.items.co.uk/

Interwise Enterprise Communication Platform (ECP)

Runs on

Server
Interwise's Expressway technology is available 3 ways, according to a customer's preference: 1) 100% hosted 2) 100% installed on a customer site 3) a blended solution combining the benefits of both the hosted and the installed models. System configurations differ by type and size of installation. For installation on site the specifications include at least 2 PCs with the following recommended specification: Windows 2000 Server (Service Pack 2) English only, Microsoft Internet Explorer 5.0, MS SQL Server 2000 (Service Pack 2), 1 GHz dual processor, 512 MB RAM, several GB Disk (depends on precise use), TCP/IP Network access with 3 static IP addresses

Client
For the **Interwise ECP Moderator and ECP Participant**: – Microsoft Windows NT 4 or 2000 with 233 MHz processor or faster and Internet Explorer Netscape browser, version 4 or higher. MS PowerPoint 2000/XP (recommended) and TCP/IP intranet access or modem Internet access

Description

Interwise ECP is a fully integrated web-based learning environment for live and asynchronous learning.

From the user's perspective there are two interfaces. These interfaces change in functionality depending on the scale and interaction of each mode. The **Moderator** interface enables a presenter to deliver and control an event. It is also the tool for creating asynchronous (pre-recorded) content. The **Participant** application is a more simple application that is intended only for those being invited to attend the event as the "audience". They are basically the receiving party and have to concentrate on the content being delivered rather than on the more sophisticated interface required for incorporating the functions necessary for delivering an event.

Due to the nature of the product, i.e. involving live interactions, it is recommended that the servers are of the high capabilities mentioned.

The key feature of ECP is building knowledge repositories quickly. This can be done by recording events and then editing, protecting and reusing them for multiple purposes at any time without the need for multiple software applications.

The Interwise 5-in-1 platform is fully hosted on the Interwise Expressway (described in the Runs on section), a distributed server infrastructure that ensures event quality and reliability for any size audience.

It is called a 5-in-1 platform because there are five methods of handling exchanges of information in ECP. Each have their own specialised mode of operation that is essential for attaining optimal results.

The five modes are

- **iMentoring**
- **iMeeting**
- **iClass**
- **iSeminar**
- **iCast**

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Fax (01784) 473868)

Contact USA

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Telephone (617) 475 2200
Fax (617) 621 3922
Web site http://www.interwise.com

Interwise Enterprise Communication Platform *(cont)*

iMentoring – tutoring and consulting

- **One-on-One Tutoring and Consulting**
  iMentoring is live, one-to-one or small group online tutoring and counselling. This mode is ideal for situations where a high degree of interaction, problem solving or skills transfer is involved, such as high-tech or customer support scenarios and training preparations or follow-up.

- **Sharing documents**
  You can share documents, applications, and look "over-the-shoulder" as if you were together in one room

- **Reusable and Scalable**
  As with all Interwise ECP events, iMentoring provides real-time experiences that are offered live or on-demand through the ability to record, edit, protect and reuse content.

iMeeting – small group meetings and videoconferences

- **Small Group Collaboration**
  iMeetings are cost-effective forums to facilitate collaboration and knowledge exchange among small workgroups over the Web – scheduled in advance or set-up on the fly. They are ideal for conducting meetings with geographically dispersed business associates, delivering custom demos, or timely team collaboration.

- **MS Outlook**
  It is possible to initiate and access iMeetings directly from MS Outlook, create high-impact content on the fly, and use five-way video conferencing to facilitate collaboration.

iClass – conceptual or skills-building classes

These are the most interactive e-learning sessions for ECP.

The iClass is leader-led e-learning – live, interactive sessions for up to 25 participants (a practical, not technical limitation) that facilitate skills and knowledge transfer for immediate application.

Features include.

- Interaction with moderators and one another in real-time

- Form smaller study groups in breakout rooms

iClass includes integrated video and audio quality, application sharing, surveys/tests, Q&A with experts, the use of live or recorded content. iClasses are designed to simulate a live classroom as much as is possible to help skill transfer that is too costly or physically impossible in a traditional classroom. This enables consistent communications, information sharing and interactive learning with dispersed groups.

iSeminar online seminars to hundreds

- **Online Seminars for hundreds of participants**
  iSeminars are live or recorded seminar-style events delivered via the Web for hundreds of geographically distributed participants. They are ideal for high-level learning, new product orientations, marketing announcements, lead generation programs, product or service seminars, competitive and press/analyst briefings.

- **Reusable and Scalable**
  iSeminars provide real-time experiences that are offered live or on-demand through the ability to record, edit, protect and reuse. iSeminars are fully hosted on the Interwise Expressway.

iCast live or on-demand broadcasts to thousands

This last section is used for online broadcasts.

iCasts are live or recorded events broadcast via the Web to thousands of geographically distributed participants. They are ideal venues for product launches and "town hall" type events.

Standards

Interwise supports the AICC and SCORM standards through a robust API layer to leading learning management systems.

Kallidus 6

Runs on

Server
A dedicated server running Microsoft Windows 2000 and IIS 5.

Client
For Kallidus 6 Learning Management System, a user requires a PC with a screen resolution of 800 x 600 running Microsoft Internet Explorer 4 or later or Netscape Navigator 4 or later. An e-mail client is optional. To create content, the Kallidus 6 Authoring System can operate on a PC with Microsoft Internet Explorer 4 +, Java Virtual Machine and which is able to run Java Applets. A screen size of 1024x768 and a colour setting of High(16 bit) or above is recommended for authoring.

Description

Kallidus 6 LMS is a completely scalable system, which enables organisations to deploy, manage and report on learning via an intranet or the Internet. The main interface for all users is a web browser. Kallidus 6 LMS can either be installed on a customer's own servers or provided by e2train as an Internet hosted service.

Student support – Using a browser and an intuitive interface, students can view their personal course planner, launch online lessons and access their training record. They can also view and search a course catalogue and enrol on courses via automated e-mail request. Kallidus 6 has optional student collaboration facilities including; chat rooms, e-mail tutor and bulletin board for threaded discussion.

Course administration – Administrators and managers access Kallidus 6 through their web browser. They can readily add lessons to courses and register students. Groups of employees can be easily created to represent the organisations' structure, departments, job roles or locations. Search facilities speed the creation of groups and course curricula. Administrators can quickly import standards compliant courseware as well as lessons created using Kallidus 6 Authoring System.

Kallidus 6 LMS can provide a thorough analysis of time spent, questions answered and all other relevant statistics. Student performance data is automatically tracked and captured in a database. Offline course performance details can also be entered and reported.

Kallidus 6 Authoring System allows the users to produce interactive learning content for web-based distribution. It is simple to use and enables an organisation's own staff to create e-Learning lessons quickly and efficiently, without the need for programming skills. The system has been developed to standards, that include AICC. Licences for the Kallidus 6 Authoring System are supplied with Kallidus 6 LMS, however, standalone licences are available to produce CD ROMs or to be used with other AICC compliant LMSs.

Course creation – Through a WYSIWYG interface, trainers can create interactive content quickly and easily:

- Text can be placed anywhere on the screen.
- Graphics images can be inserted and sized.
- Questions can be included. Examples of question types supported are multiple choice, open ended and true/false.
- Animations and buttons can be included.
- Macromedia Flash objects can be included
- Sound and video are supported. Data streaming is used to optimise download speeds.
- Page templates can be created and saved in a catalogue

Content can be published in Kallidus, AICC, LAN and CD ROM formats.

Reporting – Standard reports include; course performance, training record, incomplete lessons and session history. Reporting by individual question or page is available when used with the Kallidus 6 Authoring System. Crystal reports is also supported.

Standards

Kallidus 6 LMS has been fully certified by the AICC and is SCORM compliant. It can therefore launch and track any AICC or SCORM compliant courses.

Contact UK

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Email sales@e2train.com
Web site http://www.e2train.com/

LEAP 2.6.5

Runs on

Server
A dual Processor Server with an Intel processor and 512MB RAM, Windows NT 4.0 with Service Pack 5 and NT Option Pack (IIS 4.0, Active Server Pages, MS Transaction Server, Microsoft DAC 2.1). Supported databases are: Oracle 7.3.4, Oracle 8.0.5 or later and Microsoft SQL Server 7.0.

Client
MS Windows 95 or later **or** Windows NT 4.0 running Internet Explorer 4.0 or later **or** Netscape Navigator 4.06 or later. Developers using LEAP Learning Development System (LDS) – a Pentium 100 PC with 32MB RAM running Windows 95 or later, Internet Explorer 4.01 with Service Pack 1 or later and Word 95 or later. LEAP can also be delivered using an ASP model.

Description

LEAP is supplied by Intellinex, which is a fully owned subsidiary of Ernst & Young LLP. It is designed to support the complete learning environment for an organisation of whatever size. It supports the development and delivery of web-based training. It also supports the administration and progress recording of other forms of distance learning and of classroom and other forms of instructor-led training. It can support the e-commerce side of learning delivery where charging mechanisms are necessary. LEAP uses an open design architecture and can integrate with other packages including HR systems from suppliers that include Oracle, PeopleSoft and SAP.

LEAP comprises three major components. These are:

■ The **LEAP Learning Development System (LDS)** which has the ability to help develop and deliver content. The LDS is a Web-browser based authoring environment that has automatic version control; robust formatting options; customisable models for course, lessons, and topics, and pages; question models; question-level tracking; and spell checking. Assistance is available through integrated instructional design help. Courses can also be printed or downloaded for offline viewing.

Developers are provided with an efficient means of indexing information so that the risk of duplication is minimised and, as they create new content, this is added to the resource bank. LDS provides question wizards, models and other tools that encourage consistent presentation so that courses can be developed by teams. The models that are provided include those for course structure including lessons, topics and pages. The question wizards support a variety of question types. Tracking of answers to questions and the results of tests is also supported. All sorts of multimedia can be inserted into courses.

LDS can also be used to produce instructor-led training.

■ The **LEAP Learning Zone (LZ)** provides organisations with self-directed learning capability to all targeted audiences via a corporate intranet or the Internet. Customers and other targeted audiences can use this self-directed learning capability for items such as product and services education, while employees can focus on skill building and career development.

The LEAP Learning Zone is divided into two major components:

– Learning Zone Online enables learner self service and administrative savings by automatic updates to learning records, certifications, skill inventories, registrations and other scheduling information through web-based application. Learners can also, of course, launch web-based learning. LEAP supports skill gap analysis and the Learning Zone helps learners to assess the skills necessary for particular tasks or job roles. Learning maps are also used to provide graphical representations of the learning activities that support specific development paths. Learners can create their own learning maps to plan their own career development.

At any time learners can view the status of all the learning events that are of interest to them and print the information as a comprehensive report.

Contact UK

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Telephone 0207 951 9848
Fax 0207 951 8835
Email maria.dall@uk.ey.com

Contact USA

Intellinex inc., Huntington Building,
925 Euclid Avenue
Cleveland, OH 44115-1476
Telephone (216) 685 6000
Fax 216.685.6116
Web site http://www.intellinex.com/

Leap *(cont)*

– Learning Zone Client/Server Tools enable customisation of the Learning Zone without changing the base software and provide tools for the management of LEAP.

Administrators use the LZ Tools to:

– Make web-based training available. Since LEAP is AICC compliant there is a huge resource of courseware available commercially that can be made available to an organisation's staff.
– Maintain the calendars and other details, including resources, for off-line courses and other events.
– Set up the skills profiles for the different job roles and associate the appropriate courses and other learning events with the relevant skills.
– Handle the registration of learners and their profiles so that their personalised home page knows the skills profile of each learner and displays the relevant learning opportunities.
– Manage certification and compliance monitoring.
– Automate the sending of emails with details of registration, certification, etc.

Managers use the LZ Tools to:

– Monitor and report on the progress of their staff in meeting their learning and performance goals.
– View skills, skill requirements, and skill gaps for people in their work group.
– Assign individuals to courses and remedial work.
– Approve employees' learning requests.
– Create learning maps specific to workgroups.
– Provide reports on use and results.

■ The **LEAP Ecommerce Module** allows Clients to:

– Set prices that vary according to specific user levels.
– Split purchase revenues in a variety of ways with third party content vendors.
– Implement traditional credit card interfaces, pre-paid vouchers, and controlled purchase order options.
– Use cybercash, direct bank options or other alternatives.

Standards

LEAP LMS is AICC compliant and fully meets the requirements of AICC AGR-010. In addition to launching any course that is AICC compliant, the LMS can import and export course catalogue data to and from any AICC-compliant CBT system.

Learning Environment (le)

Runs on

Application Server	Database Server
Microsoft Windows 2000.	Microsoft SQL Server 2000 or Oracle 8i on all platforms supported by these databases.

Client
Any web enabled PC with Microsoft Internet Explorer 5.0 and above, or Netscape 4 or later.

Description

The FD Learning Environment (*le*) is a flexible and scalable Virtual Learning Environment (VLE) designed in collaboration with academic partners for the UK education market. It is mainly used in Further and Higher Education but there are also versions in the wider public sector and training markets. It is supported by a range of services delivered by education and training professionals.

le provides an online learning 'hub' where learning providers can manage and track all teaching and learning activities, bringing together resources, activities, interactions, assessments and administration – both online and offline. It supports learning via the intranet or over the Internet. Main features are:

- **Individualised learning programmes**
  Each learner has their own online working area where they can see their personal learning programme including curriculum, learning resources, activities and events. Tutors can monitor the progress of individual learners and tailor self-study learning materials, assessments and assignments to meet their individual learning requirements. Learners can view their progress and achievements and discuss them with their tutor online.

- **Professional Development Manager**
  le provides online support for skills analysis and training assessment through a competency framework. The system enables mapping of the existing skills of teaching staff against the job and role profiles of the organisation, as well as nationally recognised skills and qualifications frameworks. It is easy to identify areas in need of further development, including common training needs across a number of staff. In addition, staff can undertake online assessments to identify their own requirements. The system flags up suggested training and development programmes or activities.

- **Calendar and Events management**
  Learning events can be scheduled online and individuals or groups enrolled. An integrated online calendar gives a complete view of tutor group and course bulletin boards, private and public events. Tutors have their own specialised calendar for their tutor group and learners can see their own calendar of learning events in their personal workspace.

- **Learning Log**
  Learners, tutors and managers can work together and record goals, achievements and action plans, each with their own level of access. The Learning Log is configurable and supports shared and personal planning and reflection.

- **Collaboration and Communication**
  Online communication and collaboration facilities – email, discussion groups, chat, video conferencing, white boards and application sharing – can draw together communities of learners wherever they are individually located. *le* supports choice of collaboration and communication tools. For off-the-shelf solutions, the system already integrates Microsoft NetMeeting and the conferencing software WebBoard, allowing automatic creation of course and group conferences.

- **Assessment**
  Assessments can be mapped onto each stage of learning activity and results tracked against achievement of learning outcomes. Diagnostic, formative and summative assessments are available online. Assessments and grading schemes are user configurable. Self-assessment is provided through Question Mark Perception which is available fully integrated with the system.

Contact UK

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Telephone (0114) 2816020
Fax (0114) 2816021
Email info@fdlearning.com
Web site http://www.fdlearning.com/

Learning Environment (le) *(cont)*

- **Tracking**
  le provides extensive information to support management of learning. Tutors can review progress of learners online and in detail, at both individual and group level, drilling down to individual learner tasks and assessments. Tracking and reporting is automatic and configurable. The pattern of learning activity and amount of time 'on task' is automatically recorded. Evidence for learning outcomes and units can be shared online.

- **Content Choice**
  le supports the learning technology standards which make it possible to integrate a range of commercial, sector provided, and locally developed courseware into a VLE.
  le supports:

  – IMS Content Packaging to help load content packages into the VLE system easily
  – ADL SCORM run-time for content interworking to provide automated interaction between content and the VLE system for progress tracking, feedback of learner results and bookmarking

- **Content Delivery**
  le supports a range of Web-based learning content including materials from commercial publishers, content produced in-house in formats such as HTML, Flash, Shockwave and Java, and also existing assets in formats such as Word, PowerPoint and PDF. These are delivered securely to learners, based on enrolment options. Additional materials can be added by tutors for individuals or groups of learners to tailor the learning programme. Materials and tasks can also be released to learners gradually as the course progresses.

- **Course and Content Management**
  le allows tutors to assemble courses using a mix of materials. All materials and units can be reused, subject to controls. Learning resources can be uploaded directly to the content server, including individual and zipped files. More complex content packages can be uploaded using the IMS Content Packaging standard. *le* provides a facility for learners to upload their work as files, such as Word documents, which tutors can then access and mark within the *le* managed framework.

Standards

le uses the following specifications/standards:

IMS Content Packaging

Microsoft's LRN 2.0 and 3.0 implementations of the IMS standard

IMS Content Metadata and IEEE LOM

IMS Enterprise specification for integration with administration systems

ADL SCORM for content interworking

LearnLinc 6

Runs on

Server
LearnLinc runs under Windows NT 4.0 with Service Pack 3 **or** Windows 2000. The requirements that follow refer to the Windows 2000 Server set up for up to 25 concurrent users. Intel Pentium II 300 processor with 128MB RAM, 150MB hard disk space, Microsoft IIS Version 5.0. The requirements for Windows NT are slightly lower. If PowerPoint files are to be uploaded to the server PowerPoint 97 or higher is needed (PowerPoint 2000 is recommended).

Client
LearnLinc client PCs can run under Windows 95, 98, 2000 or Windows NT with Service Pack 3. The highest specification is for Windows 2000 and that is the one given here. Intel Pentium II 300 with 96MB RAM, sound card (full duplex recommended) microphone and headphones, 800 x 600 screen resolution and 16 bit colour. Microsoft Internet Explorer 4.01 or later **or** Netscape Navigator 4.05 or later.

Description

LearnLinc provides a virtual classroom system and a virtual campus but it can also integrate with other learning management systems described in this report. Details are given below. It supports audio conferencing, streaming video and IP multicasting.

Interactive learning components – There are several facilities available either to the learner or to the instructor, or to both, to make the learning as effective as possible. These include:

- **Handraising** – If a learner wishes to attract the instructor's attention they click on the hand raise icon. The instructor can see from a student list on their screen who has raised their hand and give control of the classroom including course content and audio-conferencing to that person.

- **Floor Control –** This provides instructor control and classroom co-ordination. There are two available policies. These are instructor-led and open discussion. Instructor-led simulates a traditional classroom where the instructor is in control of the course delivery and controls the interruptions (hand raising) from learners. In open discussion the floor control is similar to a roundtable discussion.

- **Assistant Instructor** – because numbers in a class can be large LearnLinc provides an Assistant Instructor who can support the instructor in, for example, monitoring hand raising so that the instructor is not continuously being interrupted unnecessarily.

- **Breakout Groups** can be set up to facilitate discussions, role-play and brainstorming either as specific groups or randomly. The sessions last for a given time before the class automatically reconvenes.

- **TestLinc** – This is a separate product that allows tests to be created, delivered, graded and reported on in a web browser. It is a significant product in its own right and provides comprehensive web-based testing and assessment.

- **Feedback** – Instructors can continuously monitor the feelings of the class regarding pace, progress with an assignment, agreement with content, etc.

- **Glimpse** – instructors can capture the screen of any student to monitor how they are getting on.

- **Session recording** and playback – sessions can be recorded and then edited and indexed by the tutor to make them as useful to those who have to study the session off line.

- **Two way video –** MPEG4 technology is used to support this facility even with quite low bandwidths.

- **Powerboard –** provides a sophisticated method of delivering PowerPoint presentations to all learners with annotation and highlighting features.

Other facilities are a shared pointer, text chat and the inclusion of photographs of learners and instructors.

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Web site http://www.mentergy.com/

LearnLinc 6 *(cont)*

Flexible Course Content allows the instructor to run courses using a variety of techniques. These include:

- Application Sharing where the instructor can share one or more applications or the entire desktop with learners. This is very flexible and designed particularly for software skills training. LearnLinc allows the information displayed on screens to be split into upper and lower sections. The shared application can sit in one area with the student's content in the other.

- Synchronised Multimedia Courses and Web Browser- LearnLinc supports courses written in the Authorware, Director and ToolBook authoring software. It also provides an automated link to Quest allowing for limited on-line development by the user/instructor.

  The delivery of these courses can be synchronised so that all learners work at the same speed and follow the same path. The same can be done when using a web browser.

- A Shared Whiteboard and Streaming Video are also supported. A Class Agenda can be set up to launch the components of a class automatically.

The LearnLinc **Virtual Campus** is the web-based instruction management system supporting LearnLinc courses. It can provide information about available courses, allow learners to register, handle assignments and provide access to recorded classes. It also provides security and background support for the network.

Because LearnLinc does not attempt to provide a complete learning management system it uses Microsoft SQL Server to provide connectivity with other LMSs including Docent and Pathware. Other connections are being developed with SABA among others. However, the LMS link that is strongest is with the companion product, Manager's Edge.

LearnWise

Runs on

Server
MS SQL 2000 or Oracle 8i on Microsoft Windows 2000, Solaris or Mac OS X

Client
Any web enabled PC **or** Apple Macintosh with Microsoft Internet Explorer 5.0 and above. For LearnWise Publisher, a powerful PC with Windows 95 or above and IE5.5 or above is required.

Description

LearnWise is a comprehensive Virtual Learning Environment developed by Granada Learning in conjunction with the University of Wolverhampton. It is purpose built for use in Further and Higher Education and there are also school and Corporate University versions. The system is designed for use over the Internet or via Intranets. The main features of the **LearnWise Server** are:

- **Content Delivery** – Web-based courseware is delivered securely to the student. Courseware can be custom built using LearnWise publisher or bought in from commercial publishers.

- **Student Portal** – Each student has a customisable portal that aggregates institution wide information such as notices, diaries and students unions together with a summary of registered courses and progress.

- **Collaboration tools** – The system supports a wide range of collaboration tools including email, FAQs, chat rooms, threaded forums and shared filestore. The knowledge base of Content, Forums, FAQs and People is searchable. Netmeeting or CuSeeMe IP Audio and Video conferencing are available as options.

- **Tracking and reporting** – The system tracks data including pages accessed, test scores and time on task.

- **Content Management** – The Server platform provides tools to load and amend content as well as the ability to create various types of tests and assessments.

LearnWise Publisher is a graphical content/course development tool. The main HTML editor allows the creation of course content without knowledge of HTML. Wizards create various test and assessment types and the tool can come with a subscription to Granada's content banks (10Gb+ of content – images, clips, text, audio) that can be used to kick start the development process. Content is then output in the LRN 2.0 format for use in LearnWise or other compatible Learning Environments.

LearnWise Publishing Portal is a web site that carries catalogues of courses that can be previewed, bought and downloaded. The site has a developer section that allows people to collaborate on the production of e-learning content. Granada will then manage the e-commerce and marketing of this content and pay royalties as appropriate to the authors.

TestWise is a "High Stakes" Assessment engine that enables LearnWise users to create run and analyse complex assessments. The system supports a wide range of question types and can import and export questions banks in the IMS Question & Test Interoperability format (1.2).

Interoperability – The IMS Administration interface (see Standards below) has been used to create custom interfaces for Microcompass and Capita Administration/Student Record systems.

There are various new features for 2002, which are designed to extend the service. There is now curriculum mapping for students to courses and students to work groups and/or classes. Standard content formats are supported, e.g. MS Office, PDF, TXT, RTF, flash, windows media, QuickTime, HTML. Content can now be uploaded from 3rd party products. There is tutor support including offline and/or remote access, offline and online assessments. For the assessments there is progress reporting, activity scoring and tutor feedback.

Standards

Import and Export facilities are available for the IMS Packaged format 1.0 and 1.1, with support for IMS Metadata 1.2. LearnWise is SCORM 1.2 compliant.

LearnWise comes with an XML implementation of the IMS Enterprise Specification for integration with Administration systems to form a Managed Learning Environment (MLE).

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Lotus LearningSpace 5.0 and Virtual Classroom

Runs on

Servers

LearningSpace Core and Collaboration servers:
Pentium (III) 500MHz PC with 512MB RAM (512MB recommended), Windows NT 4.0 with Service Pack 4 or higher, Windows 2000 with Service Pack 2 (recommended).

Database Server	
Microsoft	Microsoft SQL Server 7 on Windows NT 4.0 server Microsoft SQL Server 2000 for Windows 2000
Oracle	Advanced Server, Oracle 8.1.7 for Windows NT 4.0 Server, Windows 2000 Advanced Server, AIX 4.3.3, **or** Sun Solaris
IBM	IBM DB2 Universal Database 7.2 for Windows NT 4.0 Server, Windows 2000 Advanced Server, AIX 4.3.3, **or** Sun Solaris 8

Client
Pentium II 233MHz, Microsoft Windows 95, Windows 98, Windows NT 4.0 workstation, and Windows 2000 Professional. Supported browsers are Microsoft Internet Explorer 5.0.1 or 5.5 (international users must use 5.0.1), **or** Netscape Navigator 4.51 (for international users) or 4.7. Full-duplex sound card to enable speaking during Collaborative sessions, half-duplex card for just listening to Collaborative sessions, 28.8 Kbps connection speed (56 for A/V)

Description

LearningSpace 5 will be described first.

There are two product modules.

- **LearningSpace Core** module supports delivery, tracking and management of self-directed courses. These courses can easily incorporate content from any Web-based source or CD-ROM. LearningSpace Core can deliver and track any AICC-compatible off the shelf courseware.

- **LearningSpace Collaboration** module combines all the administrative and self-directed learning features of the Core module with the collaborative learning experiences of live virtual classrooms and access to shared materials. The collaboration functionality provides support for discussions and project teams, with access to class materials, exercises, and assessments. It is useful for problem-solving exercises, a forum for questions and discussions initiated by learners and for reinforcing learning done through self-directed study and real-time classes.

LearningSpace 5.0 can be deployed across one or more servers in configurations that allow for easy scaling. LearningSpace works across the Internet and intranets. Course content may be served from any server on the intranet or Internet that the student can access.

LearningSpace Collaboration creates a rich virtual classroom environment for sessions with audio and video, shared whiteboards, shared applications, electronic hand-raising, a participant list, private messages and chat functionality. LearningSpace Collaboration allows organisations to enhance self-directed and asynchronous courses by creating opportunities for communication between students and teachers. A discussion can be created to augment any course. The collaborative capabilities allow learners to work with each other to learn from their colleagues and instructors.

LearningSpace 5.0 can deliver a scalable e-learning management system. Organisations can deploy large-scale learning applications on an enterprise-wide basis. LearningSpace is built on a modular design that gives users customised access to the system based on assigned profiles. The structure can be customised to suit a variety of organisations and job roles. The modules are designed with four types of users in mind: learners, instructors, administrators, and course designers.

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Telephone (617) 577 8500
Web sites http://www.lotus.com/learningspace
& http://www.ibm.com/mindspan

Lotus LearningSpace 5.0 and Virtual Classroom *(cont)*

LearningSpace 5.0 provides the functionality to make the management of learning easier. Functions include:

- **Profiles and permissions** – The profile assigned to a learner or group of learners determines what they can access. If they do not have permission to use a particular module they will not see it when they log on.

- **Activity tracking** – LearningSpace 5.0 tracks and reports on each activity within a course, including the number of times the student launched the activity, the amount of time spent, status, score, and the learner's current location in the activity. Students can easily chat with and send e-mail to classmates and instructors.

- **Reporting** – The monitoring system provides built-in reports, including course and user information, usage statistics, and student progress data. Crystal Reports Professional can be used to extend the built-in reporting capabilities.

- **Off the shelf courseware** – LearningSpace 5.0 supports the AICC standard which allows the use of training from many companies such as IBM, NETg, and Skillsoft.

- **Content creation** – LearningSpace 5.0 supports content created from a wide variety of authoring tools including Authorware, Director and ToolBook 2. Content can also be created from Microsoft Office and Lotus SmartSuite files.

- **Assessment** – LearningSpace 5.0 includes browser based authoring for creating questions and assessments including activity pre-tests and post-tests and final exams.

The management functions of LearningSpace 5.0 allow learning program administrators to:

- publish an online catalogue of all available courses

- automate registration for courses such as new-employee orientations

- manage courses and student data for courses across the organisation

- track and report on individual and group performance

Version 5.0 allows for the recording and playback of live sessions so students never have to miss a live session. There is the option for break-out sessions during live virtual classes. Version 5.0 allows students to share documents and use e-mail launched within LearningSpace to contact classmates and instructors. Administrators can set up automatic e-mail notifications for such events as enrolment or server maintenance.

Version 5.0 can integrate with existing Lotus Domino Infrastructures. Version 5.0 is tightly integrated with Lotus Domino directories, and enables seamless coexistence of Lotus LearningSpace and Lotus Domino environments for easily managing student profiles and directory information.

There are various third party content and authoring tools that are supported in LearningSpace 5.0.

These include:

Authorware 5.2	This requires the latest WebPlayer
Flash 5	
Dreamweaver MX with CourseBuilder	
NETg	DX Web Player required to run NETg content within LearningSpace
Skillsoft	

There is a similar product to LearningSpace 5.0 called LearningSpace Forum. This version only has the asynchronous feature i.e. learning takes place online, but on the learner's own schedule. Collaboration with others takes place via online discussions without the barriers of time and place. Students access Learning Space Forum through one of several learning centres:

- Schedule – This provides students with a structured approach to assignments. Through the schedule, students can link to everything required to complete their courses.

- Media Centre – Allows immediate and searchable access to all materials for the course as they are made available by the instructor.

- CourseRoom – Hosts collaborative interchanges between student groups

LearningSpace 5.0 is available in many different languages. It is supported world-wide by the IBM Mindspan Solutions group.

Lotus LearningSpace 5.0 and Virtual Classroom *(cont)*

Virtual Classroom is an addition to LearningSpace to provide a stand alone virtual classroom system. It is designed to be easy to install and to run. Virtual Classroom can be used to:

- register participants online

- deliver a presentation with audio and video if appropriate – learning content can be developed using a range of common presentation software including Lotus Freelance Graphics and Microsoft PowerPoint

- demonstrate software packages and share the application with the students on their desktops

- send additional content to students before and after a virtual classroom session

- catalogue learning materials

- track attendance and learner profiles

During a virtual classroom session instructors can:

- receive prompts at strategic points in a class to ensure that they are running on time

- initiate breakout sessions to divide students into virtual groups and monitor their progress

- share relevant topics with all users and speaker notes with other instructors

- be questioned by the students

- be notified when the pace is too fast or too slow.

Standards

AICC and SCORM standard for tracking and compatibility between content and the learning platform.

■ Manager's Edge

Runs on

Server
Intel Pentium processors with 128MB RAM (256MB Recommended) running Unix Solaris 2.5 **or** Microsoft NT4.0 with Service Pack 3 or higher. It is designed to work with any ODBC compliant database. Fully tested databases are Microsoft SQL Server 6.5 and 7 and Oracle 7 and 8.

Client
The Administration Module will run on a workstation running Microsoft Windows 95, 98 **or** NT4.0 or higher. The LAN-based Student Module will run on similar workstations. The Browser-based Student Module is cross platform and will run on any workstation running a browser supporting Java 1.1 or higher. With Windows 95, 98 **or** NT4.0 and higher this is Internet Explorer 4.0 or higher **or** Netscape Navigator 4.04 or higher.

Description

Manager's Edge is designed to be a tool that allows an organisation to centralise its training management for both online and traditional training. The user interface can be customised to tailor it to the organisation's specific requirements.

Manager's Edge has three main components

1)   an administrative module

2)   a LAN-based student module

3)   a net based module requiring only a browser by students

The **Administrative Module** is installed on any client with connectivity to a LAN, intranet and/or web server where training managers can get access to student performance information such as names of enrolled students, scores and durations. In the administrative module, training managers can:

- design a curriculum of courses – there is a user-friendly interface that allows the administrator to build curricula that include both on-line and off-line learning activities. On-line modules can have been created in a variety of authoring systems including Quest (also from Mentergy), Authorware and ToolBook.

- Manager's Edge supports the AICC Standards so any compliant training materials can provide student performance data without changes.

- register and enrol students – administrators have a visual method that allows them to select students from a complete list and drag them to appropriate courses to register them. A variable amount of personal information can be stored. The performance of students within a course can be reviewed by selecting the course and the Performance tab.

- organise students into groups and/or classes – Courses can be set up to permit self-registration so that the administrator does not have to pre-register all eligible students. Students can be allowed to self-register into different groups. This allows them to study a curriculum that matches their job description or the qualification that they are working towards.

    Students can be grouped into classes to make it easier to manage large groups. Groups can then be dragged to a course instead of having to register individual students.

- analyse, view and print student performance data. An important aspect of Manager's Edge is its ability to report critical student performance data. The AICC standard provides a framework for collecting all types of performance data. Once the data has been captured, the next step is to print out the data for review. Comparative performance can be printed out in charts. Manager's Edge uses a Microsoft Access database to store student performance data. This means that Crystal Reports can be used to design custom reports. Crystal Reports is a widely used reporting package that can be purchased separately.

    Administrators can input and adjust performance data for learning activities that are not on-line.

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◼ Manager's Edge *(cont)*

From the administrative module data can be exported in a variety of formats such as Lotus, Excel, Access, etc. This data can be downloaded periodically and sent to a central location via email.

- ◼ assess training effectiveness – there is a wide range of standard reports for measuring the effectiveness of the training. Others can be written using Crystal Reports. These can then be included in the list with the standard reports.

The **LAN-based Module** provides access to on-line learning from a LAN environment. User module software resides on each client work station and the interface can be customised to look like a company's own training and not Manager's Edge.

The **Student Module** – Once a curriculum is established and students have been enrolled, they can take the assigned curriculum. Students can log on through the LAN-based module or remotely using only a browser. When a student logs onto the system by name and password they will see a list of activities specifically designed for them to meet their learning needs These activities can include a wide range of delivery formats such as computer-based modules, electronic workbooks, video, lectures, etc. An activity may have prerequisites, meaning that the students must complete the prerequisite activities before moving on to that activity. Prerequisites are set by the person who builds the curriculum in the administrative module.

Each time a student completes an activity, his or her status is updated to show one of six completion statuses (Not Attempted, Partially Completed, Browsed, Completed, Passed or Failed). Because Manager's Edge has an extensive system of individual and activity record keeping, previous completion data is remembered and shown to the student on subsequent entries into the student module.

Standards

Manager's Edge includes a DLL that can be used when writing courses in Authorware and ToolBook. Courses written in Quest that write data are automatically AICC compliant.

Manager's Edge covers the AICC standard for student data collection from intranet and/or web servers.

Pathlore Learning Management System 5 and Classroom Edition

Runs on

Application Server	Database Server
Windows NT Server 4.0 or Windows 2000 Server with IIS 4.0 or later **or** Netscape Web Server 3.6.3 or 4.0 **or** Sun-Netscape Alliance iPlanet 4.1	Microsoft SQL Server 7.0 or later **or** Oracle 8.0.5 or later on any Oracle supported platform. MAPI-compliant email system, e.g. Microsoft Exchange, Lotus Notes.

Learner Workstation	Administrator Workstation
Any PC running Internet Explorer 4 or later **or** Netscape Navigator 4 or later. This includes PCs running Microsoft Windows, Macintosh PCs and PCs running Unix and Linux.	Web administrator: Internet Explorer 5.5 or later **or** Netscape Navigator 6.0 or later. Windows administrator: Windows 98, 2000, XP or NT 4.00

Description

Pathlore LMS provides all of the features and facilities to support web-based training. In addition, it provides full support for virtual classrooms and traditional classroom training.

Using just a web browser, learners can:

- Access all enterprise learning resources from a single customisable web interface
- Manage their learning with transcripts, personal development plans and training calendar
- Discuss course material with peers in chat rooms
- Browse and search course and curriculum catalogues
- Correspond with their training administrators
- Evaluate classes

Instructors can:

- Give learners the ability to search for classes
- Allow learners to register, wait-list, or cancel a class booking including tracking through to completion
- Register and track individuals or groups through enrolment, cancellations and class completion
- Restrict enrolment based on capacity, eligibility and prerequisites

Managers can:

- Perform routine administrative functions easily, using just a web browser
- Centralise all their training administration, including fast registration processing, automatic correspondence, cost monitoring and customised reporting
- Manage complete learner profiles including administration records, scores, completions, mastery, attempts, time requirements and more
- Track, manage, analyse and report on any kind of enterprise training
- Set up blended curriculums and organise learners into groups based on training needs
- Manage compliance and certification programs
- Implement multiple levels of secured administrative access
- Correspond with students via any standard e-mail system

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Pathlore Learning Management System 5 and CE *(cont)*

There is an optional phone Interface, particularly for users of mobile phones which can be used to extend accessibility to the LMS. Learners can use the phone to review upcoming classes including class details and descriptions. They can review current registrations and register or cancel classes. Users can enter/update selected personal/registration data at the time of enrolment. Learners can request additional information such as transcripts.

Virtual Classrooms – To provide the virtual classroom functions Pathlore has formed partnerships with Centra and Interwise to make their products available as fully integrated components of Pathlore LMS. Both are described elsewhere in Part II of this report.

The virtual classroom facilities that are provided include the following:

- A collaborative working environment for learners and instructors.

- The ability for learners and instructors to participate over the Internet. This means that they can be at home, at work or anywhere provided they can get access to the Internet.

- A single point of entry to the learning environment whether it is for online training, accessing the virtual classroom or to organise classroom training.

- Virtual classroom courses can be can be included in the course catalogue along with online and classroom courses.

Traditional Classroom training – Pathlore LMS aims to support all the administrative aspects of booking learners onto classroom courses so:

- the availability of courses is shown in the online catalogue.

- classroom training is integrated, where appropriate, with other training in a learner's profile.

- bookings can be made and the whole process of wait-listing, cancellations, alternative dates for courses, etc. is handled.

- joining instructions and other communications with registered learners can be automatically sent by email.

- the progress of individuals on all types of training and development programmes can be tracked

Classroom training under Pathlore is comprehensive with features such as giving learners the ability to search for classes, allowing learners to register, waitlist, or cancel from classes. There is tracking through to completion. Users are registered and tracked through enrolment, cancellations and class completion. The system restricts enrolment based on capacity, eligibility and prerequisites.

LMS also supports **Competence Manager**. This is an optional package that can be purchased to allow the assessment of individual and organisational skills, and competencies, 360 degree assessment and Personal Development Planning (PDP).

The LMS Content Bridge

This is a new capability that was developed during the LMS 5.0 development cycle. This uses a patent technology to allow the LMS to launch and track online content that is not located on the LMS server. This function allows an LMS customer to launch and track online content from any server, assuming the customer has permission to access the content. This means that online content now does not need to be installed on the LMS Server for Pathlore LMS to be able to function with the content. The Content Bridge will only allow access to content that was accessible before, it is not a magical method of accessing content that there is not permission to access. The content bridge is a software module that works with the local LMS web server. Once there, it acts on behalf of the browser to stream any remote content through the local web server to the client browser, thus making both the LMS scripting code and the content appear to be from the same web domain, side-stepping the entire browser security restriction.

LMS Classroom Edition (CE)

LMS Classroom Edition manages and tracks classroom learning throughout an organisation. LMS Classroom Edition was previously known as Classroom Learning System (CLS) or Web Self Service (WSS).

LMS CE gives learners control and access to a flexible learning system that administrators can control and customise. Using any web browser, from any place in the world, learners can:

- Browse course catalogues and register for classes

- Review requirements, training history and progress

- Access training plans or calendar

- Evaluate completed courses

Pathlore Learning Management System 5 and CE *(cont)*

Working behind the scenes, the entire process can be managed using powerful features that allow administrators to:

- Control training costs
- Automate training processes
- Integrate seamlessly with enterprise systems
- Track and report classroom training

User Functions

In-Depth Training Information
Users can view a Personal Training Calendar that includes confirmed course registrations. They can review and print class rosters. They can read training bulletins and news

Centralised Classroom Administration
Routine administrative tasks can be performed from anywhere, any time, using a web browser. There is an Administration Centre to manage daily tasks, e.g. creating and managing registration, managing courses, classes and curriculums and budgeting. A Design Centre configures student access.

Web site customisation
The look and feel can be customised to the company's existing web design. Without knowing HTML or JavaScript Administrators can compose text for all site screens, including on-line help

The LMS provides a user interface in different languages (Spanish, French, etc.)

Training Registration
Individuals or groups can be registered and tracked through enrolment, cancellations and class completion. Structured curriculums can be set up and assigned to individuals or groups of learners. Wait lists are managed. You can receive notification if the class is full or the student has schedule conflicts. Student records can be updated automatically. Other functionality includes:

- Set up new classes using existing course templates
- Create a course catalogue on paper or on-line
- Record and track evaluations of courses and instructors
- Record final registration data for students who were, or were not, registered for a course

Automated Correspondence
- Correspond by e-mail, fax or directly to printer
- Send automatic confirmations, certificates, pre-course material, etc
- Distribute correspondence 24 hours a day
- Track correspondence by recipient and date received

Training Gap Analysis
- Track, ensure compliance and provide reports
- Plan, track and evaluate training for any individual or groups of learners
- Track certification and regulatory requirements
- Identify training gaps for required training and forecast demand for training programs
- Store curriculums for specific jobs, departments, etc.
- Document compliance with regulatory agencies such as such as ISO 9000, and COSHH, FDA, FSA and MCA

External Applications Integration
- Import and export records to other systems
- Automatically import records even while other applications are running, (XML and background importing).
- Interface automatically and in real time with other database applications using Java Background Import Manager, which employs industry-standard XML scripts.

Pathlore Learning Management System 5 and CE *(cont)*

Reporting

- Generate custom reports with Crystal Reports Decisions or other RDBMS reporting tools such as Cognos or Business Objects

- Use profile specific 'report views' for report users

Standards

LMS meets the AICC specifications for web and file-based Computer Managed Instruction, and is certified to AGR 006 and 010 standards, SCORM 1-2, IMS compliant.

Saba Learning Enterprise

Runs on

Server	Client
Internet/intranet Server.	Any web enabled PC.

Description

Saba Learning Enterprise is an Internet-based learning management system that automates the learning process for learners and learning providers. Saba Learning Enterprise includes the user features and facilities described next:

- Learning management – Saba Learning Enterprise supports all types of learning in addition to web-based learning. It supports classroom courses, seminars, on-the-job training and self-study using workbooks, CD-ROMs, books and other media.

- For classroom courses, seminars, etc. Saba Learning Enterprise can manage prerequisites and waiting lists.

- Competency and certification management – The level of knowledge of an employee or a team can be assessed to identify gaps. Self assessment can be used together with manager and multiple assessments, and through tests.

- Learning planning. Individual learning plans can be created and learners can then be registered for courses either using the web or by calling an administrator.

- Saba Learning Enterprise can import, launch, communicate with, and track results from, AICC compliant courses. This means that a wealth of existing courseware from major suppliers and others can be made available.

- Simple web-based access.

- Access to Saba Learning Exchange – Saba Learning Exchange is a business-to-business service that connects team leaders and individuals in global businesses to learning offerings from training providers, and opportunities to network with their peers around the world.

Saba Learning Enterprise is designed to support corporate universities, both industry and professional associations and independent training providers. It is a highly scalable system so that organisations can start small and expand or start with their system hosted by Saba and then move on to running it themselves. Functionality that supports these administrative and enterprise aspects of Saba Learning Enterprise include:

- The ability to build a wide variety of catalogues covering all the forms of training. These can vary from one covering all the training that is available, to catalogues constructed to meet specific certification or skill requirements.

- A highly scaleable architecture. This is using a domain structure linked to security lists and business rules, which allows customers to configure the application for each user and type of user, including all users within the extended enterprise – clients, customers, suppliers and partners.

- Personalised catalogues that support marketing of training to identified groups based on skills, certification, etc.

- Support for users throughout the world by allowing for different languages and time zones.

- Support for secure access by defining approval processes and, if necessary, electronic signatures

- Security can be managed according to a wide variety of criteria which can, for example, be geographic or by business unit.

- Reporting can be implemented so that reports are printed, distributed in emails or exported.

- The ability to interface with the organisation's existing systems for Finance and Human Resources.

- Link to other systems summarised in this report that are particularly strong in their support for live e-learning such as CentraOne, Interwise ECP, LearnLinc and TopClass. These are all described elsewhere in Part II of this report.

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Saba Learning Enterprise *(cont)*

Saba Learning Enterprise can be purchased to run on an organisation's own servers or hosted by Saba.

There are other compatible Saba products which can be purchased as additional modules.

Saba Collaboration

Saba Collaboration supports informal collaboration and knowledge sharing between communities through chat rooms, threaded discussions, document and URL sharing via a searchable knowledge repository. Users can also find and collaborate with subject matter experts via Saba Collaboration. Communities are organised by job type, certification, role, and competencies.

Saba Collaboration is designed to create the informal learning processes for capturing, sharing, and retaining knowledge. Saba Collaboration allows organisations to use the Internet to manage and share knowledge across the enterprise to increase reuse and access.

Saba Collaboration is an Internet-based self-service collaboration product that allows sharing between individuals and subject matter experts from any location, to ensure that valuable knowledge is distributed.

Examples of online collaboration include:

- **Best practices knowledge**: e.g. call centre teams can collaborate online about the best practices and approaches that they have learned to address customer inquiries.

- **Competitive knowledge**: e.g. sales and marketing teams can collaborate online to share research on what they know about the competitive landscape and sales techniques, then apply that knowledge to increase sales.

Saba Dialog

This is another utility for capturing and sharing knowledge. Features include secure instant messaging. This functionality ensures that users can identify when experts are online and can instantly communicate with them. Subject based filters can be implemented so users can just view other users that they are interested in. Another feature of Saba Dialog is setting up content directories based on appropriate organisational structures such as department. Questions and answers, as well as documents and links to relevant external resources, including web sites, can be connected into the knowledge repository by subject matter experts who have appropriate permissions. Expert filters can be implemented so users can view content placed in the repository by subject matter experts whose content they find particularly useful. Saba monitors the frequency with which each content item is retrieved and calculates the popularity of such content. Users can give a rating of the content as well.

Saba Publisher

Saba Publisher allows users, such as instructional designers to easily assemble all types of digital media into a single course and then publish it into HTML in a matter of seconds. Users simply drag-and-drop existing text, media and graphics files including slides, photographs, animations, videos, IPIX, text, charts, audio files, and JPEGs, into an online course. When the course is published, the user can publish the course in a single-click to either AICC or SCORM1 standards. With Saba Publisher, users take control of their content and create standards-based online courses, lessons and supplemental materials including tests and quizzes, all without the help of programmers.

Saba Content

Saba Content, is the Saba learning content management system (LCMS) which can be used with the Saba Learning Enterprise. There is a learning object repository and support for all learning content formats.

Saba Content adheres to AICC, ADL SCORM, IMS and IEEE standards. There are import wizards for Dreamweaver MX, SkillSoft, NETg content and Saba Publisher.

Standards

Saba Learning Enterprise is Level 1 AICC compliant and can import, launch, communicate with and track results from AICC compliant courses. It is also compliant to ADL SCORM, IMS and IEEE standards to improve interoperability with other learning components.

Solstra 2000

Runs on

Server	Client
Database: MS SQL 7.0 Microsoft Windows NT 4.0 **or** Microsoft Windows 2000 with Microsoft IIS.	Any web enabled PC with either Microsoft Internet Explorer version 4.0 and above **or** Netscape Navigator 4.0 and above.

Description

Solstra 2000 is a learning management system, co-developed by Futuremedia and BT, that enables organisations to deliver, track and manage multiple forms of training from a central system. Individuals get a personalised view of training and knowledge resources available to them to help them to fulfil their role or function.

Solstra 2000 can be used to deliver enterprise wide training over any type of network. It is made up of a number of separate but linked systems:

- **Solstra Administrator** manages all the learning resources. It can be used to manage off-line distance learning and on-line learning. It can also deliver on-line learning. It will monitor and track the progress of students through courses and can generate automatic emails to prompt students to start and complete courses. Administrator allows generation of reports for groups and individuals. It can assign particular courses or modules to individuals or groups based on the requirements of their particular role in the company.

  Solstra can work with a company's Human Resources software, other authoring tools and run suitable bought-in courseware.

  All available courseware is referenced in a portfolio set up for the organisation. Personal portfolios can then be built from the organisation's portfolio to make specific materials available to individuals or groups.

  Administrator also has a Promotion feature that allows students to browse through the course materials to identify their suitability. For materials that are not available on-line it can indicate where they can be obtained; with on-line products a demonstration clip can be viewed.

- **Solstra Portfolio** is a collection of courseware from a number of the leading suppliers in the UK and the USA.

Solstra provides a range of services including Solstra Production Services, Solstra Managed Services and System Integration services.

Standards

Solstra is AICC compliant.

Contact UK

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Studyserve

Runs On

Server	Client
Intranet version requires Windows 2000 Server and Microsoft SQL Server. A hosted service is offered.	Clients can access via most standard web browsers including Netscape Navigator 4.0 or above and Internet Explorer 4 or above.

Description

Studyserve is a scalable Learning Management System that will deliver, track and manage learning over the Internet or a company's intranet. Studyserve supports the delivery of third party content, and allows the exchange of data information from other sources, e.g. HR systems.

Studyserve presents two standard interfaces; the administrator interface and the student interface. Studyserve is readily configurable. Functionality can be adapted and the interface design is developed to client specifications.

Studyserve offers a secure online payment system, which enables clients to offer e-learning programmes to customers and partners.

Studyserve includes the following features:

Registration and Learner Management

- Create/edit users and groups
- Bulk import of user data
- Allocate users to group(s), courses and learning paths
- Assign other role based privileges, e.g. group communication rights
- Schedule courses and tests
- Advanced search facility
- Group e-mail
- Moderate and post to discussion forums

Content Delivery

- Add/edit courses
- Course search facility
- Vary lesson and course availability status
- Bookmarking features and status bar indicators
- Third party content may be delivered via the Studyserve platform

Testing / Assessment

- Pre- and post-tests for skills gap analysis and to check understanding
- Administrators may create customised tests for specific learner groups
- Administrators can set test conditions, e.g. time limits, number of attempts

Reporting

- Automatically generates a number of standard reports on, e.g. individual users, business units generating data on test results, pass rates, knowledge gap

Contact UK

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Web site http://www.pdol.co.uk/

Sun Enterprise Learning Platform

Runs on

Sun Enterprise Learning Platform Hosted		Sun Enterprise Learning Platform Licensed	
Client	As this is a hosted solution, clients just need Internet access and a browser. Windows 2000, NT **or** Solaris 7 or 8.	Client	Windows 2000, NT **or** Solaris 7 or 8.

Server
Windows 2000 server **or** Windows NT server. Sun Fire range of servers.
Sun's LMS can interface with existing ERP (Enterprise Resource Planning) systems and should feature a JDBC Compliant Database (Oracle, Sybase or Microsoft SQL). These allow for easy integration into any existing IT structure.

Description

Sun Enterprise Learning Platform is a learning management system which can come in two choices either hosted or licensed for installation at a company. The difference between the two will be explained later. What follows are features common to both.

Features

Student Functions
Students access Sun Enterprise Learning Platform through a browser. Sun can customise the student interface. Students can create personal learning profiles, enrol in online and classroom courses, take self-paced and live interactive courses and pay for courses – all online. Students can look through a course catalogue which includes synchronous, asynchronous, classroom, video, CD-ROM, books and exams to meet the needs of individual learning styles. To increase efficiency, students can search the catalogue before logging on to the system. There is also the feature of content searches for performance support purposes. This means that learners can refine searches for courses which will bring their skills up to date. Students also have the ability to access third party content libraries.

Assessment functionality
Sun Enterprise tests for skill gaps and provides recommendations to close gaps. The system integrates with Question Mark's Perception assessment engine. Question Mark allows the creation of short tests and exams, enabling rapid assessment creation. There are pre-defined templates for testing and evaluation for reducing instructional design time. However for the licensed version, a company must pay for a separate licence for Question Mark Perception.

Skills development functionality
Students can use the skills development functionality which comes with Sun Enterprise Learning Platform. This functionality helps define and develop skills based on assessment of job role and organisational needs. The skills development functionality closely integrates with the assessment part of the system. This means that if an assessment has gone poorly this information can be added for skills development so a user can target courses which will help improve knowledge in the relevant area. This is one part of the skills gap analysis function which offers learning paths to overcome skills gaps. Sun Enterprise can set up skill, role and task profiles to align learner needs to the organisation's goals.

Administrator Functions
The software enables administrators to manage courses, catalogues and curricula and to track and report student usage. Administering student usage involves administering testing and assessment. Administrators will also be able to manage the material presented to students and their curriculums.

Contact UK

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Web site http://www.sun.com/

Sun Enterprise Learning Platform *(cont)*

Sun Enterprise provides useful collaboration functionality for the administrator. There is interoperability with virtual classroom products. These virtual classroom products must be bought separately. Discussion groups can be created to allow peer to peer knowledge and information sharing. There is also broadcast messaging which involves instant messaging across the enterprise.

Delivery Functions

Sun Enterprise Learning Platform Management Systems provide the capability to manage training across a multitude of platforms. Sun's LMS can also deliver courses directly to students on multiple platforms. Students can choose how to approach course material to optimise their learning styles through the asynchronous delivery function or follow along with a more structured, synchronous virtual classroom course.

Multiple languages are supported.

As mentioned before Sun Enterprise Learning Platform comes in two versions which will now be explained.

Sun Enterprise Learning Platform Hosted

This is an ASP model that provides worldwide availability and one stop software.

Sun's hosted e-learning infrastructure solution is designed to reduce the complexity and time obstacles organisations can encounter when building and managing complex training operations. Sun's ASP eliminates the obligation to purchase hardware, build and maintain systems and software infrastructure and locate and retain supplemental technical expertise. Instead, the learning environment is fully hosted by Sun, with all hardware, software, 24 x 7 network and support services. New technology upgrades are also guaranteed and infrastructure consulting and support services are available through Sun Education Consulting Services making the entire process as easy as possible and efficient. A pay-per-use pricing model with minimal up-front charges and no maintenance fees reduces expenses significantly. The cost of running a training business becomes predictable and proportional to growth as payments are based only on the number of course transactions performed. Students are able to browse course catalogues, create personalised profiles, and have courses tracked and reported on a pay-per-use basis. Time-to-market is also reduced, offering learning portals to employees, business partners and customers with enhanced service levels and faster implementation. Sun deploys its hosted LMS solution through its service global centres. This instant worldwide availability is ideal for multinational enterprises.

Sun LearnTone LMS Licensed

This solution installs Sun's LMS inside a company's own firewall, enabling access through the company's intranet. The licensed version must be installed on the company's own server and it runs from that server. Sun ELP can run on Windows and Sun servers. Database software is required, e.g. Oracle.

The licensed version and hosted version of Sun Enterprise Learning Platform have the same core features. Where the two models differ is that the hosted model includes hosting (ASP) services. With the ASP version you automatically get 24 x 7 support whereas with the licensed version this is not the case.

The server for Sun Enterprise Learning Platform is separated into 3 tiers, a layer which formats and presents information to the user, a layer that stores business processing and data retrieval rules and a layer which stores user and system data. The server separation enables large scalability. The 3-tier architecture allows the LMS to scale from a single-server departmental solution to an ASP-hosted system supporting millions of users.

Standards

Confirms with SCORM 1.1/AICC standards for launching and tracking learning content.

THINQ

Runs on

Server		
THINQ Learning Manager		ASP hosted
THINQ TrainingServer LMS	Presentation tier	Windows 2000 server
	Business and Database tiers	Application server – Windows 2000 server, Net 8 Database server – SQL 2000, Windows 2000 server, Oracle 8i

Client	
Presentation tier	Internet Explorer version 5 or greater, Netscape Navigator version 4.7 or greater
Business and Database tiers	Web Clients – Internet Explorer version 5 or greater, Netscape Navigator version 4.7 or greater Windows Clients – Windows 2000 or NT

Description

THINQ has been split into two products. There is **THINQ TrainingServer LMS** and **THINQ Learning Manager**. However, the ASP solution (THINQ Learning Manager) was not, at the time of writing, marketed in the UK so will not be included in this report.

THINQ TrainingServer LMS

There are two modules in THINQ TrainingServer LMS – Web Administrator and THINQ Learner.

Web administrator
Through the THINQ TrainingServer LMS Web Administrator module, administrators can create, schedule and manage activities surrounding learning events. They can add new courses, register students and assign resources.

Features of Web administrator include:

Precision skilling
This is a technology that matches skills with courses of all modalities, using unique keyword matching algorithms. This can considerably reduce the time required to match skills to courses. TrainingServer LMS can use any proprietary or commercially available skills library to implement Precision Skilling.

Once Precision Skilling is implemented, all employees can view their current skill sets and identify learning opportunities to improve their skills and readiness for roles within the organisation. For example, Account Executives who aspire to be Sales Managers can determine the courses needed to meet their career objectives.

Profiling
Profiling identifies courses that are required for specific jobs, organisations or individuals within your enterprise. Profiling helps you determine which learners are qualified for specific jobs, organisations, or positions. Requalification is also an element of this feature.

Job Profiling, for example, allows learners to see which training, skills, or classes are recommended by their managers either to fulfil requirements of their current role or to prepare for their next role.

Reporting
THINQ TrainingServer LMS comes with over 35 standard reports. You can also write custom reports with Crystal Reports and integrate them into your system, giving a limitless opportunity for creating reports and utilising the information in your database. Performance data can be exported into an .rtf file in just a few seconds, for easy import into Word, Excel or other applications. Custom reports are registered as administrative documents within the TrainingServer LMS. They can be associated with a particular region, such as a student, course, or event. Once created, new reports will appear under the Tools menu in the Web Administrator module the next time you log in. Reports can track not only training administrative elements such as courses, students and resources, but also the utilisation and effectiveness of learning content. In this way, a decision-support engine is created, empowering both managers and learners with the information they need to be accountable for performance management.

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THINQ *(cont)*

THINQ Learner

This is self-service access for the learners. THINQ Learner is there to motivate employees to take control of their careers through web-based access to course registration, collaboration, personalised learning plans and certification management.

Learners can take control of career development paths by managing personal learning plans. They can assess skill gaps and develop learning paths to close them. THINQ Leaner will match skills with courses automatically to help close knowledge gaps with relevant learning content. Learners can register for classes, view personal transcripts and evaluate completed courses. They can access customised curricula created by their organisation or by third parties. Learners can earn and maintain job-critical certifications. Learners can stay connected with learning initiatives, even when remote.

The features of THINQ are configurable. You can create multiple learner sites, tailored to each workgroup, region, or department within an organisation that incorporate each group's language, currency, and time zone. Unique terminology and branding can also be done. Timesaving tools, such as the Configurator module, help the THINQ Professional Services team set up an organisation's LMS with their own terminology and settings.

With Configurator, administrators can effectively define items such as default settings, default data, custom processes, change management, coding schemes, and other configuration-related information. This module also allows administrators to create various security levels – student, manager and administrator – ensuring that an organisation's information security needs are met.

Standards

THINQ works with SCORM and is involved in SCORM's Working Group and Plugfest sessions.
THINQ TrainingServer LMS is SCORM compliant.

THINQ TrainingServer LMS is AICC certified. THINQ TrainingServer LMS product suite has been certified under AICC's AGR-010 (Web-based CMI Guidelines).

THINQ TrainingServer LMS is able to import IMS learning object meta-data into the course table.

TopClass e-Learning Suite 6.1

Runs on

Application Server	Database Server
Windows NT Server 4.0 with Service Pack 6a running IIS 4.0 **or** Windows 2000 Server with Service Pack 1 running IIS 5.0	Oracle 8i (8.1.7) **or** Microsoft SQL Server 2000 Standard Edition

Client
To ensure TopClass functions correctly, WBT recommends Internet Explorer 4.0, 5.0, 5.5 **or** Netscape Navigator 6.2. Windows 95 and above.

Description

e-Learning Suite is the latest version of TopClass. It is an integrated Learning Management System and Learning Content Management System. The LMS provides a partitioning facility so that a number of completely independent sets of audiences and learning materials can be set up and run from one TopClass server. This means that a number of different organisations can be provided with their own fully functioning LMS tailored for their own requirements from one server. This is likely to be of interest to ASPs and organisations that wish to run training for a number of more or less autonomous parts of a group on a standard system.

TopClass e-Learning Suite supports distance learning over a corporation's intranet or using the Internet. Through its Learning Object Architecture, TopClass will manage content recycling and also provides advanced e-learning capabilities, such as collaboration and course content that is continuously personalised based on the individual learner's knowledge and learning preferences. TopClass can link to HR, ERP and virtual classroom systems such as Centra and Interwise. (These systems are described elsewhere in Part II).

TopClass also allows training to be transferred to a PC and run off-line (See TopClass Mobile below). It provides a consistent interface for the learner and can be customised to match the look and feel of corporate intranets. It comprises the following modules:

- **TopClass Publisher** is a Windows based tool that allows subject matter experts and content developers to create and assemble web-based courses on their own PCs without any connection to the web. It requires either Windows 95, 98, NT **or** 2000.

  TopClass Publisher provides a drag-and-drop interface so that new and existing web-compatible content can be assembled into courses. People with no knowledge of HTML can do this.

  Microsoft Word and PowerPoint content can be converted to web format via drag and drop. This allows subject matter experts in the field to author their own content with tools they already use without any further training being required. This facilitates rapid knowledge capture and turnaround.

  Courseware developed using TopClass Publisher can be delivered online by TopClass or offline using TopClass Mobile.

- **TopClass Server** is the core of the system performing a number of administration and management functions.

  - It supports any web-compatible applications and can deliver streaming media, animations and video-conferencing.

  - Course content can automatically be tailored for individual learners to reflect their existing level of knowledge

  - Course materials can be shared between different groups at different levels from the whole course down to individual pages. Any updating of content can be automatically made available to all users.

  - It provides a multi-lingual interface.

TopClass e-Learning Suite 6.1 *(cont)*

– It provides comprehensive testing. It can, for example, present randomised tests from a pool of questions. Tests can include assignments, essays, etc. that will be marked by a tutor. Additional course material can be added should the results of a test indicate that the learner has specific weaknesses.

– Registration of learners and their assignment to courses is part of TopClass Server. Information from the student records can be exported to Human Resources packages (PeopleSoft, SAP, etc).

– Discussion groups can be set up for information sharing between classes, topics, etc.

TopClass Mobile allows courseware to be downloaded from a server or distributed on CD-ROM and studied off-line using a browser. Tutors control the material studied by packaging together specific content that may be downloaded by the students. Self-tests and questions can also be included in the course material. TopClass Mobile functions as a mini web server and provides an exact mirror of the online experience thereby minimising the need for additional training, etc. Mobile can also synchronise results with the server once a connection to the network is re-established. It requires either Windows 95, 98, 2000 or NT.

TopClass LMS provides full Catalogue and Registration functionality and Instructor Led training (ILT) management. The catalogue can contain all different learning types including those held external to the system (such as classroom courses, books or videos) and provides the ability to blend offerings so that the most appropriate method of learning may be provided to the student depending on the requirements of the material. The fact that all types of learning can be registered in the catalogue allows TopClass to be the single point of contact for all corporate or organisational learning.

TopClass XML Toolkit provides everything needed to use the power of XML to link TopClass with other in-house systems for information exchange, e.g. integration with HR systems.

Standards

Although TopClass provides its own tracking, logging and test scoring capability it also provides these in a standards-based manner via the AICC CMI API. TopClass has been certified by the AICC. In addition TopClass supports the SCORM standard, with support for both versions 1.1 and 1.2. WBT strives to ensure that TopClass complies with all key e-Learning industry standards, including AICC, SCORM, and IMS as well as key IT standards such as XML. This is to increase value to customers by, for example, protecting their e-Learning content investment (allowing export of content in standards-based format) and to increase customer choice (provide the ability to plug-and-play off-the-shelf content from a wide variety of content development organisations.)

Trainersoft Manager 2.09

Runs on

Server	Client
An SQL Server with ASP link to users. Trainersoft also provides an ASP hosted service.	Learners and administrators must be able to run Internet Explorer 5.0 or later on their PCs. Windows 95, 98, 2000 and XP.

Description

Trainersoft Manager supports learning over the Internet or an intranet. It provides an interface that can be tailored to meet the requirements of the purchasing organisation to support learners throughout the world. Trainersoft Manager is designed to provide a scalable easy-to-use solution to the training needs of an organisation starting with a system that supports a few hundred employees.

There are five security levels for users of Trainersoft Manager. They are administrator, supervisor, co-ordinator, mentor and learner. These can be tailored to meet the requirements of the organisation. Administrators can be defined at any level such as group, department, region and division.

Functions that are supported include:

- Learner registration by importing their details in bulk or by entering the information individually.

- Learners can be grouped according to section, job title, etc. New groups can be created easily.

- Course requirements for certification can be set up.

- Courses can be assigned to individuals, all employees and groups, or to any defined set of learners.

- Specific courses can be set up with prerequisites and unit charges.

- Courses can vary from a Microsoft Word document or PowerPoint presentation to sophisticated multimedia training. Attributes can be set for each course to provide:

  - an introductory summary
  - expiry date
  - price
  - testing functions
  - duration of the course.

- Customised course catalogues can be set up so that different learners only see courses that they are authorised to study.

- Budgeting and billing management.

- Reporting – there are 25 standard reports and others can be developed using Crystal Reports. Sample reports are also provided that can be tailored to meet the precise needs of users.

- Emails can be automatically generated and distributed using push technology.

- A mentor can be assigned to a learner for a specific course. They can then communicate with the learner using email.

- Learners can log into Trainersoft Manager to study courses and to monitor their progress.

- Any courses that are IMS compatible can be delivered using Trainersoft Manager. This means that there is a rich resource of commercial and other courseware available.

Trainersoft provide an authoring system called Trainersoft 7. This is compatible with Trainersoft Manager. See the entry in Part I.

Standards

Trainersoft Manager supports IMS, SCORM and AICC specifications.

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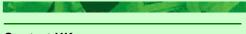
Virtual Campus 3 and eLearning Enterprise

Runs on

Server	Client
Microsoft NT Server 4.0 **or** Microsoft Windows 2000 Advanced Server and utilises IIS 4 and SQL Server 7 (SQL Server 2000). TekniCAL also offers a hosted service that makes it easy for a customer to get started. They can then move on to host Virtual Campus on their own servers if they wish.	Any PC linked to the Internet or an intranet and using Microsoft Internet Explorer 4.0 or above **or** Netscape Navigator 4.0 or above.

Description

Virtual Campus and eLearning Enterprise are systems intended for use over the Internet or intranet. Virtual Campus is aimed at education and eLearning Enterprise is designed for business. The Virtual Campus concept is based on the facilities provided by a physical college campus. eLearning Enterprise has many of the features of Virtual Campus but operates using terminology more suitable to the corporate training market. It is not described separately.

The main features of Virtual Campus are:

- Administration facilities allow registration of students and courses and assignment of courses to students. Progress of individuals and details of their activities can be recorded and monitored. Students are allowed to study only those courses that are assigned to them. Tutors can create user groups of students. The administration databases are all in standard SQL format.

- Virtual Campus can be linked to College Management Information Systems (MIS) allowing single entry of user details and storage of data.

- Personal management facilities allow individuals to record or review their activities in a personal diary. Some information such as test scores or the list of studied modules is stored automatically but the students can record information in their own diary. The diary logs all activity by the student on the campus.

- There is a large on-line courseware library available from TekniCAL that is continually expanding. Course content can also be created by specialists in organisations using the Virtual Campus authoring tools.

- Virtual Campus can launch multimedia training written in a variety of authoring systems and record progress. The course tutors can then use the Virtual Campus authoring capabilities (see below) to develop tests so that progress can also be recorded. Courses can be delivered and tracked if they are HTML based or AICC compliant.

- Virtual Campus features a Content Management tool that allows courses to be built from a series of learning objects.

- Virtual Campus can support laboratory practical work using Discovery II software. This means that compatible hardware can be controlled within the Virtual Campus.

- Facilities such as email, conferencing and notice boards allow two-way communication between the students and tutors.

- Audio conference servers can be added to the system allowing conferencing via relatively low bandwidth connections.

- The user interface can be customised to meet the requirements of the purchasing organisation.

- There is an optional authoring system module that permits developers of learning materials to produce courses. This module provides the authoring capability as a series of extensions to Microsoft Word. The Word document that comprises a module can contain, or link to, text, images, audio and video clips, Adobe Acrobat documents, Microsoft PowerPoint slide shows and Macromedia Flash or Director movies.

- A version of the authoring tool, also based upon Microsoft Word, called elearning objects, produces compliant content in learning object format for storage and retrieval from a learning object repository. The objects can be recomposed to form a basis for new e-learning content.

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Virtual Campus 3 and eLearning Enterprise *(cont)*

Virtual Campus uses a three-tier approach. The administration is carried out at the top level; this is either on TekniCAL's own server or on a server within the organisation. The College Campus server is at the second level. It holds and delivers the course content. Students are at the third level and can access the course content from the campus using the Internet or the organisation's intranet. Alternatively they can study on a local or wide area network or on a stand alone PC where the training is stored on a CD-ROM or hard disk. They may only need to connect to the College Campus server when they need to register for a new course or transfer information, such as test scores.

Standards

Virtual Campus supports the following IMS standards:

- The *IMS Question and Test standard* which describes the data structures used to provide interoperability between question and test systems.

- The *IMS Meta-Data standard* which defines a scheme for describing learning content which can then be used in a uniform manner across Virtual Learning Environments to facilitate the reuse of learning materials.

JISC/FERL standards. Based on their definitions, Virtual Campus is a Virtual Learning Environment which is a core component of a Managed Learning Environment. The abbreviations above mean Joint Information Standards Committee / Further Education Resources for Learning (web sites are www.jisc.ac.uk and http://ferl.becta.org.uk/).

Virtual Campus can also deliver and track learning materials that comply with the AICC specifications.

WBT Manager 1.6

Runs on

Database Server	Web Server
WBT Manager has been successfully run with Microsoft Access, Microsoft SQL Server and Oracle databases. It requires an ANSI SQL compliant database with ODBC Level 2 drivers and support for MFC Dynasets and ASP Record sets.	A PC running Windows NT 4 with Service Pack 6 or Windows 2000, Microsoft IIS4 with ADO support and appropriate ODBC drivers if using a database engine other than Microsoft Access.

Training Administrator Module
A PC running Microsoft Windows 95, 98, NT with Service Pack 6, ME **or** 2000 and ODBC compatible network connection to the database and appropriate ODBC drivers if using a database engine other than Microsoft Access.

Client
A microcomputer running Netscape Navigator 3.0 or later **or** Microsoft Internet Explorer 3.0 or later and with the browser plug-ins necessary to support lesson content. Versions 4.0 or later are recommended.

Purchasers can be provided with a hosted service if they do not wish to install WBT Manager on their own servers.

Description

WBT Manager is designed to organise, deploy and track web-based training courseware. It is designed to be scalable from small numbers of learners up to many thousands. It ships with a Microsoft Access database which is suitable for small numbers. For larger numbers of learners, organisations can install Microsoft SQL Server or Oracle.

The appearance of the user interface and the menus can be tailored to meet the corporate needs of the purchasing organisation.

WBT Manager consists of two modules. These are:

- The **Web Server Module** that provides browser-based interfaces for both learners and local administrators. This resides on the Web Server.

- The **Training Administrator Module** that is installed on a network workstation and provides the system administrator interface.

  The Training Administrator controls and manages WBT Manager. Some of these functions can be made available to the Web-based Administrators as is discussed later. Functions available include:

- Import and export of any AICC-compliant courses.

- Add/edit learners, tutors, departments, organisations and Web-based Administrators.

- Add/edit courses, lessons and certification information and create course catalogues.

- Import bulk student data from other enterprise databases.

- Make block enrolments using drag and drop.

- Force a lesson to be taken in a prescribed sequence where appropriate

- Track course and student status according to a variety of criteria.

- Instructor-led training is supported. Classes can be scheduled, resources assigned and bookings made.

- Scheduled self-paced training is provided using the same mechanisms as for Instructor-led training. This allows learners to be scheduled on resources with, limited availability such as labs or virtual classroom sessions.

- Set up facilities to track classroom and other non web-based activities. These will then appear on the learners' course lists together with the web-based courses.

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WBT Manager 1.6 *(cont)*

- Track progress on certification and monitor expiry dates.

- Reporting using a wide choice of pre-defined reports and easily produced custom reports.

- Set up automatic emailing to learners and Web-based Administrators to notify them of specific events.

- Set time limits for courses.

- Set up billing options for courses.

- Use a maintenance utility to purge old records.

Once the Training Administrator has carried out the basic set up, Web-based Administrators can then manage the learners and courses that have been assigned to them. Each Web-based Administrator can be given different rights so that the level of control that they have can vary. Examples of the functions that a Web-based Administrator may be authorised to carry out include, adding and editing learner details, enrolling learners, tracking of progress, entering results for classroom and other non-AICC compliant courses and reporting.

There is feature called **Department course assignment**. Training Administrators can designate specific courses to be associated with specific departments. This designation offers several convenient options, including:

- Automatically assigning the course to all new students entering the department.

- Restricting which courses are available to be assigned by local administrators.

Learners log on through their web browsers and see their personal menu of courses available to them. They can self-enrol, if appropriate, on courses and track their progress using a variety of built-in reports.

WBT Manager has its own authoring tool called WBT Author that is an easy-to-use tool for developing web-based training. More sophisticated authoring systems such as Authorware and ToolBook can also be used to develop training for delivery using WBT Manager.

WBT Manager is available in English, French, German, Italian and Spanish.

Standards

WBT Manager has AICC Web certification. This means that it is compliant with the AICC specifications for web-based training and is therefore compatible with, and can directly import, any AICC-compliant web-based courses.

WBT Manager supports Version 1.0 of SCORM and intends to support new versions as they are released.

WBT Manager 1.51 now supports the changes from the AICC CMI001 specification version 3.02.

WBT Manager can support the LMS API for SCORM version 1.0 (AICC version 3.02) (SCORM version 1.1 available shortly).

WBT Manager supports the collection of AICC "interactions" data. This data is typically used to identify the student's actual responses to individual questions.

WBT Manager 1.51 can keep track of the student's "highest score" and "best status" for a lesson.

WebCT Campus Edition

Runs on

Server	Client
Server platforms supported by WebCT Campus Edition v. 3.7 include: Microsoft Windows 2000, Red Hat Linux 6.2 and 7.2, and Sun SPARC Solaris 7 and 8.	Client operating systems supported by WebCT Campus Edition v. 3.7 include: Windows 98/ME/2000/XP, Mac OS 9.x and OS 10.1.

Browsers
Browsers supported by WebCT Campus Edition include: Microsoft Internet Explorer 5 and 6, Netscape 4.7.6 and 6.2.1, and AOL 7.0.

Description

WebCT Campus Edition is aimed primarily at the education sector. Its purpose is to provide a software platform that allows colleges and universities to deliver courses over the Web. WebCT, a course management system, offers a broad range of licensing options for institutions in various stages of e-learning adoption. One licensing option is designed for institutions that wish to deliver courses and support users over the Web but do not need extensive features for scaling or integration with campus systems.

WebCT does not require any specialised software. Everyone uses a common browser as the interface.

WebCT was developed at the University of British Colombia and is used in various parts of the world, particularly in universities.

There are four classes of user:

- The **Administrator** signs onto the WebCT administration page and uses it to create blank courses for the designer, to delete courses and for other administration functions. There is only one Administrator account. The administrator does not do any course configuration or add content. This is done by the designer. Administrators have access to the central WebCT database that controls all user access to courses or groups of courses. Administrators can create Helpdesk accounts, which may be allocated a range of administrative functions, for example, the ability to change students' passwords.

- **Course designers** create the content for the course including all media and tests. These are the people responsible for the courses and they control content, create quizzes, set grades, monitor student progress, define student groups and so on.

- **Teaching Assistants** are assigned to the course by the designer. They have the same privileges as students but can also mark and grade student tests.

- **Students** are registered and assigned courses by the Administrator and/or the course designer.

With the exception of the Administrator, all users access WebCT via a standard myWebCT (see below) login page, which automatically releases the appropriate courses at the appropriate level of user access.

Students have a number of facilities for communicating with each other as well as with markers and course designers. These include a threaded searchable bulletin board, email, chat and whiteboard. There are other facilities for students to view their own course goals, monitor progress, take tests, bookmark course content and find out about external reference material.

WebCT can interface with Question Mark Perception online quizzes. This means that instructors will be able to integrate Question Mark Perception quizzes in their WebCT course. When using this interface, the students' Question Mark Perception quiz results will automatically be added to the students' WebCT records.

myWebCT is a central location where students can see a list of courses they are registered on and instructors can see a list of courses they are teaching, if these courses are on one WebCT server.

Contact UK

Connected Learning Ltd, 27 Cappel Lane, Stanstead Abbotts, Ware,Herts SG12 8BU
Telephone (01920) 870 723 or (01453) 887 298
Fax (0207) 691 7409
Email info@connectedlearning.co.uk
Web site http://www.connectedlearning.couk/

Contact USA

WebCT Inc., Six Kimball Lane, Suite 310, Lynnfield, Massachusetts 01940
Telephone (781) 309-1000
Fax (781) 309-1001
Web site http://www.webct.com/

WebCT Campus Edition *(cont)*

The myWebCT area enables students and designers to access all of their courses from one page, using a global identifier and password. In addition, myWebCT features an announcements section, links to new bulletin board postings, mail messages, quizzes, and assignments in all of the user's courses. It also provides links to university-wide resources, such as libraries and campus services. myWebCT links to the WebCT Learning Hub, which contains additional resources for both students and instructors. Students and designers can change their password in myWebCT. Finally, when a grading record changes, myWebCT displays a link and a message.

WebCT has course management features for the course designer such as management of student records and monitoring of their progress.

The design of WebCT encourages designers to construct courses that are easy for students to navigate and study. The student data that is accumulated is also readily accessed by the tutor to monitor progress and provide feedback.

The institutional license for the full WebCT Campus Edition has a number of enhanced features. These include:

- **External User Authentication using Industry Authentication Standards**
  Institutions are able to validate user names and passwords from a centralised database using the LDAP protocol. This allows one authoritative system for authentication of users. It also allows integration of WebCT with other secure student information systems.

- **Automatic logout**
  Clients can customise the setting for automatic timeout from WebCT providing improved security and system management capabilities.

- **Automatic sign-on**
  This allows users to move from an application, such as their campus portal, to WebCT without re-entering usernames and passwords.

- **Integration with SCT Banner and Campus Pipeline**
  SCT Banner is an administration system for educational institutions and Campus Pipeline can be purchased to provide a web portal for a complete institution. If institutions wish to use WebCT with SCT Banner and/or Campus Pipeline, this feature means that students and course designers can link directly to their courses from the Campus Pipeline Portal without logging on again. It also means that courses, students and course designers are automatically available to WebCT once they have been added to SCT Banner and that data can be passed from one system to the other.

A significant recent addition to WebCT Campus Edition is the equation editor, a tool for creating and editing mathematical equations in Web pages. Based on MathML, the powerful language for Web-based maths, the equation editor allows WebCT users – faculty, course designers and students – to type, manipulate and edit mathematical equations in their online courses. Now, teachers and students in a broad range of disciplines, including mathematics, the sciences and social sciences can communicate in mathematical terms in their WebCT courses. Having the equation editor built in improves the quality of the interactions in maths and science-based courses. The ability to quickly and easily create equations for quizzes, content, and in discussions allows tutors and students to express concepts and manipulate the equations in a more dynamic way than has been possible before.

WebCT also offers WebCT Vista, an Academic Enterprise System. WebCT Vista is designed for institutions that centrally support a single e-learning platform, that have made a serious commitment to the role of e-learning on their campuses, and that have the technical expertise to administer an enterprise-class e-learning system.

Standards

WebCT Campus Edition is compliant with the IMS Enterprise Specification for managing student and course data. The IMS Enterprise specification is focused on interoperability between systems residing within the same organisation. WebCT Campus Edition's IMS-compliant Student Data API is designed to enhance the ability of WebCT to interface efficiently with student information systems. WebCT's student record interface also complies with the IMS open standards in this critical area. The interface conforms to the XML format described in the IMS Enterprise Specification, which means that WebCT Campus Edition can be integrated with any system that can read and write the IMS Enterprise specification and open standard.

WebCT Campus Edition uses XML and the IMS Enterprise specification for passing data between WebCT and third-party systems.

WebCT Campus Edition will add the ability to work with content delivered in the IMS Content Packaging specification.

Some useful web sites

Web sites and email addresses are given throughout this report so that readers can get more information about specific products, standards and specifications and so on. There are, however, two specific sites that are particularly relevant in the general context of authoring systems and learning management systems. They are both based in North America and concentrate on that market. They cover most of the systems described in this report but in a different way.

The web sites are:

http://www.brandon-hall.com/

Brandon Hall is a consultancy, based in California, that concentrates on the uses of technology in learning. They produce a number of reports including one that covers learning management systems that are available in the USA. It covers many of the systems included in this report and many others in addition.

http://www.ctt.bc.ca/landonline/index.html

This is a site that is specifically aimed at helping those in education who are reviewing possible systems for online delivery of learning.

Glossary

This Glossary aims to cover terms that appear in this report and may be unfamiliar to readers who are not IT specialists. It is assumed that such readers will not be interested in the specifics of the hardware and software needed to run the packages described in this report. Terms and abbreviations that are included in the "Runs on" part of each entry will not therefore generally be included in this Glossary. The Webopedia (http://www.webopedia.com/) and FOLDOC (Free On-Line Directory Of Computing – http://foldoc.doc.ic.ac.uk/) are useful glossaries for computer related terms. Several of the descriptions below have benefited from the descriptions in these sources

ActiveX	A set of *object-oriented* programming technologies and tools developed by Microsoft. One application of ActiveX is the development of ActiveX controls, which can be written in a variety of programming languages and can be executed from within an application, e.g. a web browser, in a similar fashion to Java *applets*.
ADLNet	(Advanced Distributed Learning Network – http://www.adlnet.org/) was set up by the US Government mainly to support distributed learning for the military and other government agencies. It has produced the SCORM (Shareable Courseware Object Reference Model) specification. See the reference in the introduction to Part II.
AICC	(Aviation Industry CBT Committee – http://www.aicc.org/) The AICC has been in existence for many years. It has designed CBT standards for the aviation industry to allow interactive training to be delivered across different hardware and software platforms. Their work includes a model for Computer Managed instruction (CMI) which is currently being extended to cover web delivery of training. See the reference in the introduction to Part II.
API	(Application Program Interface) a set of routines, protocols, and tools for building software applications. A good API makes it easier to develop a program by providing all the building blocks. A programmer puts the blocks together. Most operating environments, such as MS-Windows, provide an API so that programmers can write applications consistent with the operating environment. Although APIs are designed for programmers, they are ultimately good for users because they guarantee that all programs using a common API will have similar interfaces. This makes it easier for users to learn new programs.
Applet	A small Java program that can only be executed from within an application. Applets are widely used on the web because they can be made secure.
ASP	(Application Service Provider) a third party provider of Internet services. ASPs allow an organisation to outsource the provision of, say, an *LMS*.
Authentication	The process of identifying an individual. This is usually based on a username and password but can use other means such as smart cards. Where the usage of the system by the individual is being charged or the learning may lead to certification, reliable authentication and other aspects of security are obviously critical.
AVI	(Audio Video Interleave) the video file format used by Microsoft Video for Windows.
Blended Learning	Learning delivered using a mixture of different methods that may include, for example, classroom courses, workshops, seminars, tutor support and appropriate forms of distance learning such as print based modules and computer based training in the form of e-learning, virtual classrooms, computer based training on CD ROM and so on.
CEN/ISSS LT	(European Community Information Society Standardization System for Learning Technology – http://www.cenorm.be/isss/workshop) is a European working group that is examining emerging standards and assessing them to see how well they meet the multilingual and multicultural requirements of the European Community. Only where the group deems it essential will they create any new standards. See the reference in the introduction to Part II.
Crystal Reports	A widely used reporting package produced by Crystal Decisions http://www.crystaldecisions.com/
DDE	(Dynamic Data Exchange) A system that allows two applications to share the same data.
DHTML	(Dynamic HyperText Markup Language) An extension to HTML that gives greater control over layout and allows a web page to interact with the user without communicating with the server.
DLL	(Dynamic Link Library) A library of routines or data that can be used by a Windows application.

E-learning	E-learning is the integration of technology-based learning materials, support and services to provide flexible learning opportunities using a browser-based system. Note that this is our definition. See the discussion in the Introduction to Part II.
ERP	(Enterprise Resource Planning) a business management system that integrates all facets of the business, including planning, manufacturing, sales, and marketing. As the ERP methodology has become more popular, software applications have emerged to help business managers implement ERP.
Flash	A software package supplied by Macromedia that can be used to develop web-based vector graphic animations for delivery using a browser. It is increasingly being used for developing web delivered multimedia training.
GIF	(Graphic Interchange Format) A formatting language used to develop the basic layout of web pages. It allows hyperlinks, tables, graphics etc.
HR	Human Resources
HTML	(HyperText Markup Language) a programming language used to develop web pages. It allows hyperlinks, formatting, etc.
IEEE	(Institute of Electrical and Electronic Engineers – http://www.ieee.org/) The Learning Technology Standards Committee of the IEEE is the main educational body that can establish recognised standards for learning management in the USA. See the reference in the introduction to Part II.
IMS	(IMS Global Consortium – http://www.imsproject.org/) IMS works with educational institutions and software suppliers in the field to define specifications. It has produced specifications on learning objects (learning object metadata), content packaging, enterprise and question and test interoperability. Other specifications on content management, learner profiles, collaboration and messaging are at different stages of development. The IMS groups work closely with the relevant working groups of the IEEE. See the reference in the introduction to Part II.
IP	(Internet Protocol) IP defines the format of packets of data and addressing mechanisms for the Internet.
ISO	(International Standards Organisation) ISO has sub-committee SC36 working on standardisation in the area of learning technology. It liaises with the IEEE LTSC. See the reference in the introduction to Part II.
Java	An object-oriented programming language developed by Sun Microsystems. It is widely used for developing applications for the web. Applets can be downloaded and run by Java-enabled web browsers. Netscape Navigator and Microsoft Internet Explorer are both Java compatible.
JavaScript	A programming language developed by Netscape that is used by web developers to produce interactive web sites. It can interact with HTML and the two are often used together.
JDBC	(Java Database Connectivity) Similar to *ODBC* but *Java* specific.
JISC	(Joint Information Standards Committee – http://www.jisc.ac.uk/). A strategic advisory committee working on behalf of the funding bodies for higher and further education in England, Scotland, Wales and Northern Ireland.
Learner Profiling	A method of analysing individual learners that identifies a range of characteristics such as educational level, cultural background, learning style and preferred learning environment.
LMS	(Learning Management System) Part II of this report covers LMSs in their widest sense. See the Introduction to Part II for a discussion.
LOGO	An easy to learn programming language that can be successfully used by young children.
LRN	(Learning Resource Interchange) An application of the IMS Content Packaging Specification Version 1.0. Developed by Microsoft, there is a LRN Toolkit available on the Microsoft web site (at www.microsoft.com/elearn/support.asp) that can be downloaded. See the reference in the introduction to Part II.
MCI	(Management Charter Initiative) Nationally recognised management standards in the UK. They define standards for different levels of management from supervisory to senior management.
n-tier	A client-server architecture that separates the different functions into independent modules. This means that updates of different modules can be carried out independently of others. The user interface is an example of a tier.

Object Oriented Design	A design technique that solves design problems in terms of objects, their interactions and the functions that act upon those objects. This should lead to reusable code and easier updating. *Java* is an example of a programming language for developing object-oriented applications.
ODBC	(Open Database Connectivity) A standard database access method developed by Microsoft. A lot of software provides ODBC drivers to ensure compatibility between databases and applications.
OLE	(Object Linking and Embedding) – A standard defined by Microsoft that enables objects created with one application to be embedded in another. So, an Excel spreadsheet can be embedded in a Word document. The link to Excel will be maintained.
Question Mark Perception	(http://www.questionmark.com/) A widely used software package for the development, delivery and marking of tests and surveys. There are versions for the web and for Windows. The suppliers are Question Mark Computing Ltd.
SCORM	(Shareable Courseware Object Reference Model) See under ADLNET.
SMTP	(Simple Mail Transfer Protocol) The protocol that specifies the rules for sending electronic mail over networks. It is the main protocol for sending messages between servers on the Internet.
URL	(Uniform Resource Locator) the global address of a resource on the Internet. The address of a web page is an example but URLs can point to other information.
VoIP	(Voice over Internet Protocol) The use of the Internet to transmit telephone calls.
WYSIWYG	(What You See Is What You Get) A term which refers to the ability of a content development environment. For example, a word processor or a web page editor, to allow the user to see how the final product, e.g. a printed page or a web page, will appear to a high degree of accuracy.
XML	(eXtensible Markup Language) a markup language that adds functionality to HTML.

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Suppliers

UK and Ireland

BYG Systems Ltd
1-2 William Lee Building,
Nottingham Science and Technology Park,
University Boulevard, Nottingham NG7 2RQ.
Telephone: (0115) 9252221. Fax: (0115) 9223496.
TX-Authoring

Cambridge Software
Graham McIntosh, Chief Operating Officer, 124 Cambridge Science Park,
Milton Road, Cambridge CB4 0ZS
Telephone: 01223 425558. Email: gmcintosh@logo.com
COSE 2

Centra Software EMEA,
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Telephone: 01628 509023. Email: Europe@centra.com
CentraOne

Centrinity UK Ltd,
Regus House, Highbridge, Oxford Road, Uxbridge UB8 1HR
Telephone: 01895 876 130 Email: uk-info@centrinity.com
FirstClass Version 6

Chest
Queen Anne House, 11 Charlotte Street , Bath. BA1 2NE
Telephone: 01225 474303 Email helpdesk@chest.ac.uk
Blackboard e-Education Suite

click2learn.com
225 Marsh Wall, Docklands, London, E14 9FW.
Telephone: 020 7517 4200. Fax: (020) 7517 4201. Email: sales.europe@click2learn.com
ToolBook II Assistant 8 and Instructor 8.5
Aspen 2

Computers Unlimited
The Technology Park, Colindeep Lane, London NW9 6BX.
Telephone: +44 (0) 208 200 8282. Fax: +44 (0) 208 200 3788.
Director MX
Dreamweaver MX with CourseBuilder

Connected Learning Ltd
27 Cappel Lane, Stanstead Abbotts, Ware, Hertfordshire SG12 8BU
Telephone: (01920) 870 723. or (01453) 887 298. Fax: (0207) 691 7409. Email: info@connectedlearning.co.uk
WebCT Campus Edition

Digital Workshop
42-44 North Bar, Banbury, Oxon OX16 0TH.
Telephone: 01295 258335. Fax: 01295 254590. Email: enquiries@digitalworkshop.com
Illuminatus Opus

Docent (UK) Ltd
8 Minster Court, Tuscam Way,
Camberley, Surrey GU15 3YY
Telephone: 01276 60 1000. Fax: 01276 60 1123. Email: europe_info@docent.com
Docent Enterprise 6

e2train Ltd
3 Longwood Court, Love Lane, Cirencester,
Gloucestershire GL7 1YG
Telephone: 01285 883900. Fax: 01285 883901. Email: sales@e2train.com
Kallidus 6

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CW12 4SY
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WBT Manager 1.51

FLEXeLEARN Ltd
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Learning Environment (le)

Futuremedia Plc
Media House, Arundel Road, Walberton, Arundel,
West Sussex BN18 0QP
Telephone 01243 555000. Fax 01243 555020. Email: solstra@solstra.com
Solstra 2000

Granada Learning
Quay Street, Manchester M60 9EA
Telephone: 0161 827 2927. Fax: 0161 827 2966. Email: info@granada-learning.com
LearnWise

Hewlett–Packard Ltd
Nine Mile Ride, Wokingham, Berkshire, RG40 3LL
Telephone 01344 763311. Fax: 01344 763151. Email: hpe_sales@hp.com
HP Virtual Classroom

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coMentor, Ramsden Building Queensgate, Huddersfield HD1 3DH
Telephone: 01484 473674. Fax: 01484 473670. Email: comentor@hud.ac.uk.
coMentor

Information Transfer Limited
Burleigh House, 15 Newmarket Road, Cambridge CB5 8EG
Telephone: 01223 312 227. Fax: 01223 310200. Email: mail@seminar.co.uk
Seminar4Web

Intela Media Ltd
Claire House, Bridge Street, Leatherhead, Surrey KT22 8BZ.
Telephone: 01372 363717. Fax: 01372 363766.
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DazzlerMax and DazzlerMax Deluxe

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London W1J 8AJ
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LEAP

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Interwise ECP

ITD3 Ltd
4 Bonneys Yard, The Street, Eversley, Hook, Hampshire RG27 0PJ
Telephone: 07000 483483. Fax: 07000 329483. Email: info@items.co.uk
inClass

John Matchett Limited
Linden House, 55 South Bar, Banbury, Oxfordshire OX16 9AB.
Telephone: (01295) 256161. Fax (01295) 272108. Email: sales@jmlnet.com
Pathlore Learning Management System 5 and Classroom Edition

LJ Technical Systems Ltd.
5/6 Francis Way, Bowthorpe , Norwich, NR1 1UA
Telephone: (01603) 748001. Fax: (01603) 746340. Email: sales@ljgroup.com
ClassAct

Lotus Development UK,
Lotus Park, The Causeway, Staines, Middlesex TW18 3AG
Telephone: 01784 445 692.
Lotus LearningSpace 5.0

Macromedia
Century Court, Millenium Way, Bracknell, RG12 2XN
Telephone: 0344 458 600. Fax: 0344 458 666
Authorware 6.5
Director MX
Dreamweaver MX with CourseBuilder

Mentergy
277 Cranbrook Road, Ilford, Essex, IGI 4TG
Telephone: 020 8554 9100. Fax 020 8554 9435. Email: info@mentergy.eu.com
Designer's Edge 4.0 Enterprise
LearnLinc
Manager's Edge
Quest 7.0

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16 Narborough Wood Business Park, Desford Road, Enderby, Leicestershire LE9 5XT
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Designer's Edge 4.0 Enterprise
LearnLinc
Manager's Edge
Quest 7.0

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Pathlore Learning Management System 5 and Classroom Edition

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Studyserve

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Saba Learning Enterprise

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COSE 2

Sun Microsystems
Farnborough Aerospace Centre 2,
Woodside Road, Farnborough,
Hampshire GU14 6XR
Telephone 01252 399 570); Email uk-response@uk.sun.com
Sun Enterprise Communication Platform (ECP)

TAG Learning Ltd,
25 Pelham Road, Gravesend,
Kent DA11 0HU
Telephone 01474 537886 Email info@taglearning.com
HyperStudio 4.2

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Hessle, East Yorkshire
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Virtual Campus 3 and eLearning Enterprise

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THINQ LMS 5

The Thompson Partnership
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NeoBook for Windows Version 4

Trainersoft EUROPE
Mowbray House, 58-70 Edgware Way, Edgware, Middlesex, HA8 8DJ.
Telephone: 0800 0283948 or 020-8958-8959. Email: info@trainersoft.co.uk
Trainersoft 7
Trainersoft Manager 2.09

University of Wales
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TopClass 6

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Blackboard e-Education Suite

Centra Software Inc,
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CentraOne

Centrinity Inc.,
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FirstClass 6

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Blackboard e-Education Suite

click2learn.com Inc.
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Telephone: (425) 462-0501. Fax: (425) 637 1504. Email: sales@click2learn.com
ToolBook II Assistant 8 and Instructor 8.5
Aspen 2

Docent, Inc
2444 Charleston Road, Mountain View, CA 94043
Telephone: (650) 934 9500. Toll Free: 1 888 9411. Fax: (650) 963 9411. Email: info@docent.com
Docent Enterprise 5

Feedback Inc
437 Dimmocks Mill Road, P.O. Box 400, Hillsborough, North Carolina 27278.
Telephone: (919) 644 6466. Fax: (919) 644 6470
Virtual Campus 3 and eLearning Enterprise

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HP Virtual Classroom

Integrity eLearning
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WBT Manager 1.51

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LEAP 2.6.5

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Everest 2.2

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HyperStudio 4.2

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ClassAct

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IBM Software Group, One Rogers Street, Cambridge Parkway, MA02412.
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Lotus LearningSpace 5.0

Macromedia Inc.
600 Townsend Street, San Francisco, Cal 94103.
Telephone: (415) 252 2000. Fax: (415) 626 0554.
Authorware 6.5
Director MX
Dreamweaver MX with CourseBuilder

MaxIT Corporation,
2771-29 Monument Road, MS-355,
Jacksonville, FL32225
Telephone: (904) 998 9520 or Toll Free 800 868 8039. Fax: (904) 998 0221. Email: webmaster@maxit.com
DazzlerMax and DazzlerMax Deluxe

Mentergy
5 Triad Center 5th Floor, Salt Lake City, UT 84180,
Telephone: (801) 537 7800. Fax: (801) 537 7805. Email: info@mentergy.com
Designer's Edge 4.0 Enterprise
LearnLinc 5.2
Manager's Edge
Quest 7.0

NeoSoft Corp.
PO Box 5667, Bend, Oregon 97708-5667.
Telephone: (541) 389 5489. Fax: (541) 388 8221. Email: sales@neosoftware.com
NeoBook for Windows Version 4

Pathlore Software
Corporation Headquarters, 7965 North High Street, Suite 300, Columbus, Ohio, 43235.
Telephone: (614) 781 0036. Fax: (614) 781 7200.
Pathlore Learning Management System 5 and Classroom Edition

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Saba Learning Enterprise

Sun Microsystems
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Sun Enterprise Learning Platform

Telematica (US) Ltd
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EASE

THINQ Learning Solutions Inc.,
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Billerica, MA 01821
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THINQ

Trainersoft Corporation
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Trainersoft Manager 2.09

WBT Systems
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TopClass 6

WebCT Inc.
Six Kimball Lane, Suite 310, Lynnfield, Massachusetts 01940
Telephone: (781) 309-1000 Fax: (781) 309-1001
WebCT Campus Edition