



A FutureU™ Industry Review

**COMPARATIVE FEATURES ANALYSIS OF  
LEADING COLLABORATION SOFTWARE**



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## Executive Summary

Several hundred players are currently struggling to grab market share in the dynamic, rapidly evolving world of virtual collaboration software (VCS). For years, our company, FutureU, has been helping organizations not only control costs but actually improve communication and training by adding a virtual component to their interactions. However, the choices of software for this purpose are so unproven, so varied in their design and pricing structure, and so frequently updated that even experienced technology decision makers hesitate to move forward. We help them clarify what they really need, navigate the many choices, minimize resistance and instill best practices among the people who will be using the software. In short, we help them make the most of what is often a major investment.

During 2002, FutureU completed a research study of virtual collaboration software products. Our goals were threefold: 1) to help software buyers make *informed* decisions when they purchase this kind of software, 2) to provide collaborative software developers with insight into both their competition and their customer base, so they can make informed decisions around product enhancement and market positioning, and 3) to improve communications between vendors and users.

In this study, we started by identifying the type of applications most often named by our clients and industry pundits as the those they most sought:

1. real-time web-based meetings.
2. data and file sharing.
3. knowledge management.
4. online collaborative workspaces.

We surveyed more than 150 current virtual collaborators to find out what features they valued and desired. Combining these results with expert knowledge from our associate pool, we developed a list of the generic features that might best serve virtual communications and collaboration efforts.

After completing this features list, we searched the market place for all truly viable collaborative software products that supported the robust set of desirable features we had developed. To qualify for further inquiry in our study, a product had to meet two essential criteria. Every contender had to excel in all four application areas. And, it had to allow the user to integrate two or more applications; for example, participants in a Web-based meeting had to be able to share files on their screens. After carefully eliminating any product that did not meet these standards, we compared the handful that did make the cut.

We identified several software packages that allow the user to integrate all four applications into a single environment. Upon close examination, however, we discovered that none of these packages provided as strong an environment for real-time meetings as the two real-time meeting packages which did not offer the other three features (data/file sharing, knowledge management, or collaborative work space). This led us to create two comparison sets of features: real-time meeting software, on the one hand, and collaboration/knowledge management (including data/file sharing)

software on the other. Our research identified a total of 52 important features for real-time meeting software and 51 features for collaboration/knowledge management software.

Perhaps the most vital selection criterion was cross-platform compatibility; for a product to make it into our final comparison group it had to support Windows, Macintosh, and either Unix or Linux. Such compatibility is especially important to any loosely integrated organization where members bring their own computer equipment to the table or where technology capabilities have grown piecemeal, but even the most uniform group is likely to have visitors—customers, for example—who ought not to be excluded out of hand. Therefore, any package that did not support all three platforms was automatically dropped from consideration. A product was also disqualified if it required the latest versions of these operating systems and did not support recent legacy versions, such as Windows 95/98 or Macintosh System 8/9.

Among the real-time meeting packages, we ultimately narrowed the field to the three we found to be best of breed and compared them for the size of their user base, the robustness of their environment, and their ease of use. At the same time, we determined that leaders ought not to shoulder out a lesser-known product that may offer a promising set of new features that might help establish future standards in the real-time meeting arena.

Similarly, our comparison of knowledge management/collaborative work space packages revealed three leaders, based on size of user base, the power of their engine (how much tailoring has to be done "out of the box," how well organized is the tool set, etc.), and the degree of flexibility in adoption. In addition, we looked for packages that could be tailored to match *their competitors* feature for feature, regardless of whether they exhibited certain features out-of-the-box.

For both kinds of software (real-time meetings and knowledge management/collaborative work space), a consideration of particular interest was pricing. Here the research uncovered a great disparity among vendors in terms of :

- The model used for pricing (ASP versus server license; quantity discounts; high degree of variability in pricing through negotiation)
- The potential hidden cost of customization or the need to purchase additional modules to obtain all the desired features
- Installation and maintenance costs
- A vendor's willingness, or lack thereof, to lower prices to close a deal.(Some educated haggling can bring huge discounts from some vendors while others budge very little.)

Among buyers there is also a great variability when it comes to cost. The most attractive pricing structure for one buyer might be totally unsuitable for another. In making a choice, we determined that the buyer must weigh these factors:

- Size of the overall user group (a pointer, possibly to ease of use and ease of support. Also, user groups can be a valuable source of knowledge about making the most of any software product).
- Anticipated frequency of use.
- Availability of up-front funds for an initial investment vs. a smaller outlay across time.
- Complexity of needs.

- User preferences.
- Likelihood of user resistance (Technological and attitudinal readiness).
- Diversity of user group (e.g., mostly technology power users, mostly novices, or an even mix?)
- The average size of a group expected to attend any one real-time meeting.

## **Introduction**

### ***Background***

Recent world events are causing business leaders to look more seriously at ways to connect people without using airplanes, bridges, or the mail. Higher education too has seen a growing demand for technology-mediated interaction. The shrinking cost and growing functionality of the necessary software is allowing more and more decision makers to justify the investment. One of the fastest growing areas in the technology-mediated communication arena is the use of the Internet by businesses to supplement face-to-face meetings with online components and to execute some initiatives completely online.

Until recently, keeping the cost of technology mediation to a minimum was the top priority for most business leaders. Now, attitudes are evolving. People are starting to acknowledge that a significant investment in virtual collaboration tools can yield valuable long-term benefits that are well worth the initial cost. As a result, support and funding for virtual communications and collaboration software are on the rise.

Also until recently, most vendors have promoted their products as a way to lower costs. In practice, however, this has not proven to be the case. Initial investment requirements can be especially high when retraining, deployment, and support are included in the calculation. The payoff from technology mediation comes not in cost savings but in enhanced communications and efficiency for existing projects and team-based events. Virtual communication allows an organization to better support its current staff and customer base while improving overall performance.

### ***Virtual Collaboration Software (VCS)***

Key to a successful virtual collaboration is robust software that is easy to learn; easy to use; flexible; and rich in features. The product must be no more difficult than any other routine computer activity.

Not all collaboration software vendors were created equal, however. Some have only limited uses, such as real-time meetings or asynchronous discussion forums. Others specialize in data and file sharing tools or full-blown knowledge management engines. Still others offer a limited set of tools to facilitate virtual teaming, perhaps combining real-time meeting software with email, asynchronous forums and file sharing. A handful of vendors claim to have created a full set of collaboration tools.

Such a wide variety of offerings naturally begs the question of whether an "all-in-one" package is a better investment than several separate applications combined to create a custom system.

Unfortunately, the all-in-one systems too often combine several mediocre applications with one or two robust applications to create a solution that "works" but with glaring weaknesses.

Conversely, any attempt to integrate a set of separate best-of-breed applications may lead to a frustrating jumble of problems with user-interface, application integration and compatibility.

Although some interoperability standards do exist, they are not universally applied. This is probably why some companies try to offer an all-in-one system. In theory, the buyer who identifies a set of best-of-breed applications that all use the same standard, will have the best overall solution.

## **Methodology**

For reviews and comparisons of virtual collaboration software, FutureU searched popular periodicals such as *InfoWorld*, *PC Magazine*, and *PC Week*, as well as several books and Web sites. This search revealed more than two hundred different virtual collaboration software products. (See Appendix 2: Articles, Books and Web Sites Searched in This Study and Appendix 3: The Universe of Collaborative Software.)

## **Products Reviewed**

A decision was made to focus on products that met certain essential criteria, including cross-platform compatibility, ease of use, and flexibility in tailoring to meet specific needs. In order for a software product to make the final list for detailed evaluation, it had to support at least Windows 98, Macintosh OS 9, and Unix and/or Linux.

It is FutureU's contention that the tendency of many vendors to ignore significant market segments, such as Macintosh or Unix users, is not only a disservice to those segments but a long-term strategic mistake. Failing to serve millions of customers only promotes market domination by Windows, thus constraining innovation. Moreover, in our subjective experience, Mac and Unix users tend to take more of an interest in collaboration and innovation than the average Windows user. For this reason, and because our own client organizations have preferred cross-platform capability, we chose not to review products that were available only for Windows.

From the original list of more than 200 products (See Appendix 3: The Universe of Collaborative Software), this requirement alone eliminated all but 90 from consideration. These 90 products were then examined for the extent to which they provided the two sets of desirable features we had developed for real-time meeting software and knowledge management/collaboration software. To determine the minimum set of features we should use for product selection, we interviewed dozens of decision makers and team leaders and surveyed more than 150 virtual communicators who might benefit from collaborative software tools..

For data/file sharing, knowledge management, and collaborative work spaces, these three products made it into the final list for comparison:

- *eRoom*
- *LiveLink*

- *Intraspect*

For real-time, web-based meetings, only two products qualified for closer examination:

- *HorizonLive*
- *WebEx*

A third vendor, *Virtual Design Net*, is a relatively new entrant into the real-time meeting software arena and is included as a point of reference for what is technologically feasible today and in the near future. *Virtual Design Net* did not meet our compatibility requirements, primarily because access to a full set of features requires the Windows XP or MacOS 10 operating systems.

In future studies, FutureU will evaluate groupware, comprehensive consulting solutions, and third-party providers of collaborative software services in greater detail.

### **Assumptions**

At FutureU, we take the position that satisfaction with any single software product is highly subjective and that attempts at quantitative analysis are therefore of little practical use—with the possible exception of cost. For example, we interviewed several decision makers who, after extensive product comparisons, had adopted one of the products covered in this report. They always managed to justify their choice. A decision maker from Company A would choose Product 1 and a decision maker from Company B would choose Product 2, for the espoused same reasons. Each buyer was enthusiastic about the product they had finally chosen. When talking to the decision maker in Company A, they would often cite exactly the same list of weaknesses for Product 1 that the person from Company B cited for Product 2. Moreover, each decision maker always seemed to have figured out a "work around" to overcome any perceived product shortcomings.

To reiterate, we have not attempted to evaluate these products quantitatively. Instead, we offer a check list of desired features and indicate whether each product does or does not have each feature.

Similarly, we have made no attempt to evaluate the effectiveness of specific features, because we believe that idiosyncratic learning styles and application features can profoundly influence an individual's assessment of effectiveness. The single quantitative measure we do provide is a score of the number of features in a given product as a function of the total number of features evaluated in this study.

FutureU produced a similar list of desirable features for e-learning software in 2000. It has been used as a guide by thousands of higher education decision makers and is still in demand. We feel confident that buyers of collaborative software will find the features-based approach of this report equally valuable.



## Features

To be included on the list of important features, a feature had to be:

- Considered essential for virtual teaming or virtual collaboration by FutureU technical staff
- Frequently requested by FutureU clients
- Frequently mentioned in third-party reviews
- Specifically requested by the current virtual collaborators we surveyed

From these criteria FutureU concluded that the ideal collaboration environment would routinely support communication, data and file sharing (document collaboration), knowledge management tools and work flow organization and that it would offer an easy-to-use interface, robust "back-office" administrative features, and solid training and support services.

Features that support communications were divided into synchronous real-time meetings and asynchronous forums/bulletin boards.

The list of 52 features deemed desirable for real-time meeting software was organized into five sub-categories: collaboration, delivery/user interface, management and administration, training and support, and sales model. Collaboration itself was taken to another level of detail, creating the four sub-sub-categories of communications, sharing, presenting, and event management.

The list of 51 features for collaboration and knowledge management software was organized into the same five sub-categories of collaboration, delivery/user interface, management and administration, training and support, and sales model. In this list, collaboration was further broken down into communications, document/file sharing, and work organization.

For a complete list of the features considered in this study, you may review the data tables in Appendix 1.

### **Real-Time Meeting Software (Synchronous) – 52 Features**

- Collaboration (29 Features)
  - Communications (12 Features)
  - Sharing (5 Features)
  - Presentation (10 Features)
  - Event Management (2 features)
- Delivery/User Interface (7 Features)
- Management and Administration (4 Features)
- Training and Support (9 Features)
- Sales Model (3 Features)

### **Data and File Sharing, Knowledge Management, Collaboration Software (Asynchronous) – 51 Features**

- Collaboration (24 Features)
  - Communications (5 Features)
  - Document/File Sharing (6 Features)
  - Work Organization (13 Features)
- Delivery/User Interface (11 Features)
- Management and Administration (4 Features)
- Training and Support (9 Features)
- Sales Model (3 Features)

## ***Feature Descriptions***

### **Real-Time, Online Meeting Software (Synchronous)**

Real-time meeting software allows individuals to carry on a meeting at a mutually acceptable time, regardless of where they are located geographically. This category of collaborative software provides a set of tools similar to what is available in a face-to-face meeting, including virtual equivalents of the white board, slide projector, the raising of hands to ask a question or make a comment, voting, and creation of a record of what transpired in the meeting. Because attendees in a real-time online meeting are all connected to the Internet, they can show one another any resource that can be accessed through a browser, just as if they were projecting the image on a screen in a face-to-face meeting. Discussion takes place through teleconferencing or typed chat. An image of the presenter usually appears on the screen, as if he or she were standing at the head of the room.

Most major online meeting software also allows participants to share images on their computer desktops, just as they might share whatever is on their computer if it were connected to a projector at the front of the room.

### **Collaboration Features**

Collaboration features enhance and support the efforts of two or more people to work together. They improve communication by automating certain steps in the process, such as scheduling an event or sending out invitations.

#### *Communications Features*

Communication features help individuals share information in a variety of ways, including verbally, by typing, or through images. In our analysis of real-time online meeting software we focused on the following communications features:

##### *Chat (Internal-Intranet and/or External-Internet)*

Here, messages are typed back and forth between presenter and participant or among participants. Most real-time online meeting software provides a simple chat window that allows participants to type in questions or comments that everyone can see or that can be seen only by selected recipients. With an "Internal-Intranet" feature, the chat software is accessible only by participants who already have access to the organization's internal network, whereas "External-Internet" means participants who do not normally have access to the organization's internal network may nonetheless access the real-time meeting software and use its chat function during the meeting.

##### *Audio (Interactive and/or One Way Only)*

When this feature is available, presenter and participants can hear recorded sound played over their computer speakers or through a headset. The ability to play audio recordings during an online meeting simulates the use of a playback device in a face-to-face meeting to share music, recorded lectures, and other audio resources. With "Interactive" audio, any presenter or participant may share recorded audio with all the other attendees. With "One Way Only," by contrast, only the presenter may share audio resources. Sometimes, if an online meeting software supports the sharing of audio

resources, it can also support teleconferencing by Internet-based IP Telephony. For more on this feature, see "Teleconferencing" below.

*Video (Interactive and/or One Way Only)*

As with audio, when this feature is available the presenter and all participants see a recorded video displayed on their computer monitors. This simulates the use of a video playback device to present a documentary film, advertisement, recorded lecture or other motion picture. With "Interactive" video, the show may originate from the desktop of the presenter or any participant. With "One Way Only," the presenter alone may initiate the sharing of video resources. Usually, if an online meeting software supports the sharing of video resources, it can also display live images of the presenter and/or participants. For more on this feature, see "Video Images" below.

*Teleconferencing (Phone and/or IP Telephony)*

This is among the most important features of any real-time online meeting software. Teleconferencing allows multiple participants to communicate verbally in real time. It replaces the quick-paced, spontaneous, improvised discussions that take place in a face-to-face meeting. There are two ways to deliver teleconferencing: over the standard phone system or by using IP Telephony over the Internet. Most IP Telephony offers only "half-duplex" quality, which requires users to speak one at a time or risk not hearing what others are saying. "Full-duplex" IP Telephony capability is expected to become widely available in the coming year or two, providing delays roughly equivalent to those from a cell phone.

*Video Images (Leader's and/or Participant's)*

This feature allows participants to see a live image of their presenter or, ideally, any other participant who "takes the floor."

*Online Polling*

Pre-designed or ad-hoc polls help a collaborative group to air opinions anonymously or make a decision together.

*Question/Comment (Raised Hand) Indicator*

With this function the presenter/leader knows when a participant has a question or comment.

*Sharing Features*

*Presenter Can Access a Computer Remotely*

For anyone presenting at an online meeting while away from their own desk, this feature is a real blessing in that it allows them to access files and information stored back at the office. All this requires is a little planning. If they put their office computer on a standby connection to the Internet before they leave, the software will allow them to access it from any other computer. Moreover, they can then share the remotely accessed computer's applications, desktop, or files with the online meeting participants.

*Web Browser Sharing*

Here the application being shared is a Web browser. This features allows a presenter to access the Internet with a browser and then share what they are seeing on that browser with online meeting

participants. Control of the browser can be passed around from one participant to another, but only one participant at a time may have control.

#### *Application Viewing and Sharing*

This feature is a must for collaborative situations. It allows the presenter to share the use of a Web browser, spreadsheet, word processing document, CAD, slide presentations, or other application. In other words, participants don't just *see* the application; the presenter can actually turn it over to any participant, who then operates it as if it were on his or her own desktop. Everyone in attendance sees the application from their own desktop, but, to avoid chaos, only one person at a time may control it.

#### *Desktop Viewing and Sharing*

With application sharing, participants see only one application at a time. With desktop sharing, the presenter's entire computer is on view to all participants. Just as with application sharing, participants view the desktop and any applications that are running, the presenter may hand over control of their entire desktop or any application on it, and all participants can simultaneously watch what is happening.

#### *Transfer Files between Presenter and Participants*

This handy function allows a presenter to open a download dialog window in which files are listed and from which files may be downloaded during an online meeting. Even though the performance of this feature is somewhat dependent on bandwidth, it does allow distribution of files more quickly than by email attachment. It also permits the sharing of files larger than many email servers can handle.

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#### *Presentation Features*

##### *Whiteboard*

Like a classroom blackboard, this simple annotation tool lets the presenter draw on a blank space on the screen while participants watch from their own desktops. The presenter may also project an image or document and then draw on it. The presenter controls access to the whiteboard function or hands over control to one or more participants, who draw on the shared whiteboard while everyone else watches.

##### *Annotations*

This is the actual tool set for making annotations on a document or image projected into the whiteboard. It usually includes the electronic equivalent of chalk or markers, plus special tools such as arrows, check marks, drawing tools, and alpha/numeric tools for entering labels or formulas.

##### *PPT Slides, Animations, Full Screen View*

This function allows the presenter to upload an existing PowerPoint or other presentation slides, or Flash or other animations, to the online meeting space and then play these files back during the meeting. Full screen view allows the presenter to eliminate distractions and make a greater impact by forcing the slides to take up the full size of every participant's monitor.

#### *Multiple Presentations*

This function allows the presenter to upload more than one slide show or animation in advance of the meeting and then display it at will as the meeting proceeds.

#### *Share View of Other Images (jpeg, gif, etc)*

This function allows the sharing of image files other than slides or animations. Usually, if a real-time online meeting software has a whiteboard function, the capability of sharing images in the whiteboard is included.

#### *Presenter-Guided Internet Tours*

Sometimes called an "Internet Safari," this feature allows a presenter to take participants on a virtual journey to a predetermined set of Web pages. Unlike Web-browser sharing or Web-content push, this feature simply displays the selected pages one at a time as the presenter goes through them. A special application, built into the meeting software, is used instead of a browser. Some vendors opt to use this proprietary approach while others accomplish the same thing with application sharing. A guided tour provides a list of links to the pages that will be visited, whereas browser sharing usually does not. However, one could always list the links on a manually constructed, stand-alone Web page.

#### *Web Content Push*

With this feature, Web resources such as streaming video, audio or other multimedia, Web-based surveys, and proprietary Web applications can be "pushed" to the participants' desktops. The significant difference between this function and browser sharing is that with browser sharing only one participant at a time can have control over the Web page being viewed. With Web content push all participants can simultaneously interact with the Web page that has been "pushed" to them.

For example, if a survey is located at <http://mysite.com/survey.html>, that URL may be pushed to all participants simultaneously. Each participant will have their own copy of the Web page at that location and can fill out and submit the survey at the same time.

#### *Presentation/Meeting Recording/Playback*

This is the ability to record and archive for later replay the entire contents of any online meeting. Most vendors accomplish this by providing a special box that plugs into one of the computers participating in the meeting that records everything that is displayed in the meeting space along with the telephone or IP telephony supplied audio.

#### *Record and Playback Editor*

With this feature you may edit the recordings made of online meetings. An hour-long meeting, for example, could be edited down to the 30 or 40 minutes of essential content, or shorter excerpts could be excerpted as media resources for other presentations or Web pages. Typically, the media production quality is rudimentary.

#### *Shared Presentation/Facilitation*

This is simply the ability to pass control of a meeting from the original presenter to any participant.

## *Event Management*

### *Automated Invitations*

This feature allows a meeting convener to automatically invite participants to a meeting by sending them an email invitation of the meeting time and URL. It allows the convener to enter participant emails from an address book or manually during the process of setting the meeting up and then the software automatically generates the invitation.

### *Who's Present Indicator*

This allows the presenter and other participants to quickly tell who is present in the online meeting space. It is usually just a list of login names displayed prominently on the opening page of the meeting.

## *Delivery/User Interface Features*

### *Desktop Access*

This features may be self-evident. It is meant to differentiate between online meeting software that runs on the participant's own computer from video or audio teleconferencing systems that require a separate room, as with, for example, the Polycom video conferencing system.

### *Open Source Code*

This allows software license holders to make their own modifications to the software and to share those modifications with other owners of the same software. The Linux operating system is a good example of an open source code software.

### *Open Standards*

Here the software vendor has utilized some widely accepted standard for how the software should operate. Open standard software tends to be easier to learn if the user is already familiar with other software that used the same standards. Open standards also tend to make it easier for organizations to create their own applications and integrate them with the purchased software. It is possible to have open standards and yet not support open source code. Most organizations desire both.

### *Bandwidth Independent*

With this feature, any user may participate fully in a meeting, regardless of the speed of their connection, with little or no difference between slow access and higher speeds. Some vendors provide this feature by accommodating legacy operating systems, while others include functionality that automatically detects connection speeds and compensates for slower connections. Most vendors claim to be bandwidth independent, but accomplish this by providing a reduced feature set to users on slower connections. For example, graphic images may not be displayed to users dialing in with slow modems.

### *Platform Independent*

For the purposes of this study, a platform-independent product supports at least Windows 98, MacOS 9, and the Linux and/or Unix operating systems. The preference, of course, is for products that support all legacy systems in the user group, going back to at least Windows 95 and MacOS 8. Some vendors claim to be platform independent, but are not; full functionality requires Windows

2000 or XP or MacOS 10. Or older operating system versions contain a reduced feature set of the software. At the time of this writing, absolute platform independence offering a full feature set has not been found in any application.

#### *Wireless Access*

With the rise of wireless networks and millions of Internet-capable PDAs and cell phones, more and more people expect to be able to use these devices to attend an online meeting. People with PDAs and cell phones want the freedom to attend literally from the beach. The ability to use certain meeting features, such as slide shows, Internet tours, or polling, during a face-to-face meeting is an additional benefit of a wireless network that deserves closer scrutiny. Such a capability has the potential to make regular meeting more productive.

### Management and Administration Features

#### *Reporting*

Understanding usage patterns is a great aid in making management decisions about resource allocation. The reporting function should at least allow managers to track how many people use the system, who they are, what they are using it for, and how much are they using it. This can be especially valuable data when the time comes to upgrade, expand, or decide to abandon a technology.

#### *Archiving*

This important function allows storage of completed meetings for future access. With real-time meeting software, this function is usually synonymous with "Presentation/Meeting Recording/Playback."

#### *Security*

Although most organizations require strong assurances about the protection of their proprietary information, the degree of concern will vary greatly. A government agency would likely require tighter security than a celebrity fan club, for example. Because it utilizes the Internet, online meeting software therefore needs to offer multiple levels of security such as SSL (Secure Socket Layer), VPN (Virtual Private Network), and password protected access.

#### *Scalable*

This function makes it easy to add users. It also eliminates obstacles to going from a few dozen to a few hundred to thousands or tens of thousands of users, without increasing the per-user costs. The ideal is this: the more new users, the less cost for each one. Scalability should also mean no unreasonable expenditures for additional hardware infrastructure.

### Training and Support

#### *Software Installation*

Here the vendor provides assistance with installation of the software. If the vendor offers an ASP model, then any required plug-ins should be easy to install. Highly responsive handholding should be provided for any after-installation issues that arise.

#### *Hardware Installation*

Here the vendor provides assistance with installation of the hardware. This is moot for an ASP model.

#### *Company-Wide Deployment*

This is simply an answer to the question of whether a vendor has had experience in rolling its product out to an entire organization, with all the complexity and issues that entails.

#### *Largest Current Deployment*

This item is included in the data tables, but it is not counted as a feature either for or against a vendor. It simply states the largest level of deployment that the vendor has succeeded with to date.

#### *Help Desk*

Good user support is among the most valuable features any software vendor can offer. Too many hide behind voice mail and email and are too slow to respond. Most customers want help immediately; they don't have time for delayed email exchanges and they don't want to be kept waiting on the phone. Even if a vendor offers 24/7/365 support, if they don't have enough staff to keep the waiting period down to a few minutes, they are falling down on the job. It is impossible to measure support response times without spending some time testing the software and calling for help. Because to actually measure support times would be prohibitively expensive and time consuming, in this report we only include the **vendor's promises** about availability.

#### *Phone/Work Days/Work Hours*

This feature means that the vendor at least has support staff available by phone during normal working hours.

#### *Email or Online*

This feature shows that the vendor at least provides an email link or feedback form to handle support online. Although better than no support at all, this represents the very lowest level of acceptable support.

#### *Phone 24/7*

Here telephone support is available 24 hours a day, 7 days a week. This is the ideal.

#### *Training (For leaders/facilitators)*

This feature means that the vendor provides training for anyone who will convene and lead online meetings. Some vendors charge for this training; others include it in the purchase price.

#### *Training (For participants)*

This feature means that the vendor provides training not just for presenters but for online meeting participants as well. Again, some vendors charge; others include this training in the purchase price. For some buyers, this feature might clinch the deal, if, say, meeting participants are known to be technologically sophisticated; however, at FutureU, our experience is that even a group of senior research scientists or university faculty members will get more out of the software if they have good training first.



### *Manual*

This simply means that the vendor provides an electronic or paper book that documents how to use the software. Never assume such a manual exists.

## Sales Model

### *Site License*

In this pricing model the vendor allows customers to license the software and run it on their own servers.

### *ASP Model*

ASP stands for **A**pplication **S**ervice **P**rovider. This feature means that the vendor offers access to the software by hosting it on vendor servers.

### *Free Trial*

Highly desirable, usually possible if the sale is big enough, but not always advertised by the vendor. Ask for hands-on access, not just a demonstration. If your potential purchase is significant enough in size, or if your organization offers name recognition that might boost other sales, most vendors will provide a short free trial to test the software.

## **Virtual Collaboration Software (Asynchronous)**

### **Collaboration Features**

Virtual collaboration software allows individuals to work together on projects from any location and at times convenient to the individual participants. This category of software provides a set of tools that facilitate file and data sharing; the collection, organization and dissemination of various kinds of information (also known as knowledge management); and features that support time-independent (asynchronous) communications, such as discussion forums, calendaring and scheduling, announcements, circulation tools, and file archives.

#### *Communication Features*

##### *Bulletin Board/Announcements*

This feature facilitates the distribution of non-interactive information. It is the equivalent of a real-world bulletin board, poster, or memorandum. The "bulletin board" feature allows users to post announcements, protocols, procedures and so forth. It is usually a "read only" non-interactive communication. Many vendors provide this feature for managers/leaders only; some make it available to anyone.

##### *Discussion Forums*

This kind of discussion takes place independent of time or place, thus eliminating the need for coordinating attendance. It is a prime feature of effective virtual collaboration, in which team leaders and members discuss in depth, multiple topics across time. This feature allows for "threaded" discussions, whereby participants may organize their interactions by topic and follow each topic separately, like separate "threads" of a conversation. In most software, the user may switch between seeing the messages in absolute chronological order, or in threaded order. It should also be possible to search a group of messages by author, date, subject, or message body text.

##### *E-Mail*

Some collaboration software products have a built in email capacity, while others rely on the user's own email client. Some vendors also allow users to post messages and files to the collaboration space using email, instead of requiring them to visit a Web site. This is often referred to as having all objects in the knowledge base "email addressable."

Users have been known to complain if they have to add a second email program or other separate communication space to their daily routine. So being able to interact with a collaboration space or knowledge base by email can be an important aid in speeding up wide-spread adoption. Moreover, important archives may be lost if a software product is used for a while and then later abandoned because users found it difficult or inconvenient to use.

##### *Group Tools*

This feature facilitates group projects or virtual teaming. It may include a wide variety of process tools but usually at least two: automatic circulation to a group of subscribers and special break out areas exclusive to each group. Examples of the best practices from previous users of the software or

early adopters within an organization can also serve as a “group tool” by showing the way to effective use.

## Document/File Sharing Features

### *Attachments (email or conference posting)*

Most users will want to be able to attach a document to an email message or to a discussion forum posting.

### *Upload/Download to File Sharing Site*

It is important that it be easy to upload and download files to and from a folder within the application space. Some systems manage this with FTP (File Transfer Protocol) and some with HTTP interfaces. Either is acceptable as long as the interface is easy to use and does not require any complicated command-line operations. The ideal is to "drag and drop" files from the user's desktop to the application space folder. Many vendors use Java applets to accomplish this and most have yet to extend this capability to both Macintosh and Windows, providing it for only one or the other operating system.

### *Document Version Tracking*

This automated fail-safe prevents overwriting of previous versions of a shared file. The ideal is when the application space automatically renames every new version or requires the user to do so. Some vendors provide a "check-out" system that won't allow more than one person at a time to download a file to work on it.

### *Document Format Conversion*

Sometimes referred to as a "document filter," this feature is for converting a document from one common format to another.

### *Document Indexing/TOC*

Here the user may create an index or table of contents for any shared document from within the application space. Very few vendors offer this feature, relying instead on the user's desktop applications, Microsoft Word for example, to do the job.

### *Shared Image Gallery*

This is an automated system for sharing images. It should allow the user to display thumbnail-sized versions of all the images in a shared folder for easy browsing and previewing. Simply clicking on any one thumbnail should bring up a full-size version of the image and provide a link for quick downloading.

## Work Organization Features

### *Knowledge Base or Information Repository (Automatic Database Storage and Indexing)*

This is a key feature of any knowledge management system. It allows all content shared in the application space to be stored and retrieved through a powerful search/index capability. Thus, the

user need only search for a keyword or phrase from any part of the document, whether meta information (author, date of creation, subject) or actual content.

*Subscriptions/Notification of changes to Knowledge Base*

This is the ability to subscribe to a keyword or phrase and be notified automatically when any changes are made to any document containing that keyword or phrase.

*Calendaring/Scheduling*

This is the capability of coordinating individual calendars through project calendars.

*Due Date Reminders*

Here users receive automatic notification of any due dates posted in the shared project calendar.

*Invitations to Events/Meetings*

Huge savings in time and postage are possible through automatic email invitations to events and meetings, whether scheduled for online or face to face.. Evidence suggests people are also more inclined to respond right away, giving planners an immediate attendance count.

*Facility Scheduling*

Seldom a deal breaker, this feature is nonetheless much appreciated, especially when more than one person does the booking on physical meeting rooms , audio-visual equipment, and other resources that are in great demand.

*Project Management Tools*

These tools aid in the management of projects, such as proposal and report templates or automated Gantt charts. Some vendors offer sophisticated templates to aid in project management.

*Team Workspace*

The core feature for teams, it allows any group to collect, manage, retrieve and share all the information, other digital resources, and communications related to one project or one group of people, such as a department, team or committee.

*Workflow Diagrams/Templates*

These templates assist in managing workflow. Once a process has been designed, it can be organized in a template that is part of the knowledge management system. This gives users a model to follow and allows them to track the progress of a project and determine milestones that must be approved along the way.

*Task Management*

This is any tool that helps track assignments, priorities, due dates, resource usage and so forth. Commonly it is some sort of to-do list with a prioritization key.

*Hyperlinked Org Chart*

A centrally updated organizational chart allows a user to click on any function/role box in the chart to obtain contact information for the person responsible.

#### *Hyperlinked Directory*

This is a database of all contact information within the organization. To see a profile and/or open a blank email, a user clicks on a name.

#### *My Page/My Summary/Dashboard View*

Sometimes referred to as the "My Yahoo" page, this capability gives the user a customizable entry page displaying only those parts of the system that the user needs or wants to see.

### **Delivery/User Interface Features**

#### *Open Source Code*

This allows software license holders to make their own modifications to the software and to share those modifications with other owners of the same software. The Linux operating system is a good example of an open source code software.

#### *Open Standards*

Here the software vendor has utilized some widely accepted standard for how the software should operate. Open standard software tends to be easier to learn if the user is already familiar with other software that used the same standards. Open standards also tend to make it easier for organizations to create their own applications and integrate them with the purchased software. It is possible to have open standards and yet not support open source code. Most organizations desire both.

#### *Bandwidth Independent*

With this feature, any user may participate fully in a meeting, regardless of the speed of their connection, with little or no difference between slow access and higher speeds. Some vendors provide this feature by accommodating legacy operating systems, while others include functionality that automatically detects connection speeds and compensates for slower connections. Most vendors claim to be bandwidth independent, but accomplish this by providing a reduced feature set to users on slower connections. For example, graphic images may not be displayed to users dialing in with slow modems.

#### *Platform Independent*

For the purposes of this study, a platform-independent product supports at least Windows 98, MacOS 9, and the Linux and/or Unix operating systems. The preference, of course, is for products that support all legacy systems in the user group, going back to at least Windows 95 and MacOS 8. Some vendors claim to be platform independent, but are not; full functionality requires Windows 2000 or XP or MacOS 10. Or older operating system versions contain a reduced feature set of the software. At the time of this writing, absolute platform independence offering a full feature set has not been found in any application.

#### *Wireless Access*

With the rise of wireless networks and millions of Internet-capable PDAs and cell phones, more and more people expect to be able to use these devices to attend an online meeting. People with PDAs and cell phones want the freedom to attend literally from the beach. The ability to use certain meeting features, such as slide shows, Internet tours, or polling, during a face-to-face

meeting is an additional benefit of a wireless network that deserves closer scrutiny. Such a capability has the potential to make regular meeting more productive.

#### *ODBC compliant*

**Open DataBase Connectivity (ODBC)** is an **Application Programming Interface (API)** that allows a program to be written that can access a database, pull data, and generate a program or report. If an organization is using several databases, for example, Access, Fox, and Oracle, to generate a single program or report from those databases would usually require writing a program in all three of those database languages. Challenging to say the least. With ODBC you only need to talk the ODBC language (a combination of ODBC API function calls and SQL—SQL or **Structured Query Language** is used to communicate with a database).

The ODBC Manager will figure out how to contend with the type of database you are targeting. Regardless of the database type you are using, all of your calls will be to the ODBC API. All that you need to do is have installed an ODBC driver that is specific to the type of database you will be using. ODBC only works with databases that are ODBC compliant. Many databases, such as Filemaker, for example, are not fully ODBC compliant.

#### *Reporting*

Understanding usage patterns is a great aid in making management decisions about resource allocation. The reporting function should at least allow managers to track how many people use the system, who they are, what they are using it for, and how much are they using it. This can be especially valuable data when the time comes to upgrade, expand, or decide to abandon a technology.

#### *Archiving*

This important function allows storage of completed meetings for future access. With real-time meeting software, this function is usually synonymous with "Presentation/Meeting Recording/Playback."

#### *Security*

Although most organizations require strong assurances about the protection of their proprietary information, the degree of concern will vary greatly. A government agency would likely require tighter security than a celebrity fan club, for example. Because it utilizes the Internet, online meeting software therefore needs to offer multiple levels of security such as SSL (**Secure Socket Layer**), VPN (**Virtual Private Network**), and password protected access.

#### *Scalable*

This function makes it easy to add users. It also eliminates obstacles to going from a few dozen to a few hundred to thousands or tens of thousands of users, without increasing the per-user costs. The ideal is this: the more new users, the less cost for each one. Scalability should also mean no unreasonable expenditures for additional hardware infrastructure.

## Training and Support

### *Software Installation*

Here the vendor provides assistance with installation of the software. If the vendor offers an ASP model, then any required plug-ins should be easy to install. Highly responsive handholding should be provided for any after-installation issues that arise.

### *Hardware Installation*

Here the vendor provides assistance with installation of the hardware. This is moot for an ASP model.

### *Company-Wide Deployment*

This is simply an answer to the question of whether a vendor has had experience in rolling its product out to an entire organization, with all the complexity and issues that entails.

### *Largest Current Deployment*

This item is included in the data tables, but it is not counted as a feature either for or against a vendor. It simply states the largest level of deployment that the vendor has succeeded with to date.

### *Help Desk*

Good user support is among the most valuable features any software vendor can offer. Too many hide behind voice mail and email and are too slow to respond. Most customers want help immediately; they don't have time for delayed email exchanges and they don't want to be kept waiting on the phone. Even if a vendor offers 24/7/365 support, if they don't have enough staff to keep the waiting period down to a few minutes, they are falling down on the job. It is impossible to measure support response times without spending some time testing the software and calling for help. Because to actually measure support times would be prohibitively expensive and time consuming, in this report we only include the **vendor's promises** about availability.

### *Phone/Work Days/Work Hours*

This feature means that the vendor at least has support staff available by phone during normal working hours.

### *Email or Online*

This feature shows that the vendor at least provides an email link or feedback form to handle support online. Although better than no support at all, this represents the very lowest level of acceptable support.

### *Phone 24/7*

Here telephone support is available 24 hours a day, 7 days a week. This is the ideal.

### *Training (For leaders/facilitators)*

This feature means that the vendor provides training for anyone who will convene and lead online meetings. Some vendors charge for this training; others include it in the purchase price.

### *Training (For participants)*

This feature means that the vendor provides training not just for presenters but for online meeting participants as well. Again, some vendors charge; others include this training in the purchase price. For some buyers, this feature might clinch the deal, if, say, meeting participants are known to be technologically sophisticated; however, at FutureU, our experience is that even a group of senior research scientists or university faculty members will get more out of the software if they have good training first.

#### *Manual*

This simply means that the vendor provides an electronic or paper book that documents how to use the software. Never assume such a manual exists.

### Sales Model

#### *Site License*

In this pricing model the vendor allows customers to license the software and run it on their own servers.

#### *ASP Model*

ASP stands for **A**pplication **S**ervice **P**rovider. This feature means that the vendor offers access to the software by hosting it on vendor servers.

#### *Free Trial*

Highly desirable, usually possible if the sale is big enough, but not always advertised by the vendor. Ask for hands-on access, not just a demonstration. If your potential purchase is significant enough in size, or if your organization offers name recognition that might boost other sales, most vendors will provide a short free trial to test the software.



## **Data**

### ***Data Sources***

Data for this study came directly from the vendors through interviews and demonstrations, benefits descriptions from vendor Web sites, collateral marketing materials, and hands-on testing of the software itself. These data sources were supplemented with information from current journal articles and Web sites that offer access to evaluation initiatives by other institutions or agencies.

An email message went out from FutureU to each of the companies whose products we hoped to evaluate. Attached to the email was an Excel spreadsheet containing our best guess as to whether the company's product did or did not have each of the desired features. We asked each company to confirm whether it offered each of the features and to explain, in writing, any disagreements with our assumptions. We then revisited each software vendor's demo site to confirm for ourselves that their answers were indeed true. We also scheduled face-to-face demonstrations of each product to further confirm the existence of the features and to uncover any additional features that may have been overlooked in our original research.

If a vendor chose to answer "Coming Soon" instead of "No" to a particular feature, we decided to convert all such answers to "No" and leave it up to the marketplace to keep tabs on future changes.

### ***Discussion of Findings***

#### **Real-Time Meeting Software**

A comparison of the top three contenders in the real-time meeting software category (synchronous) revealed the following:

*WebEx* for the Windows platform has the highest number of desired features (47 out of 52, or 90% of the total list). *HorizonLive* has the next highest number of features (43 out of the 52, or 83% of the total list). *Virtual Design Net* has 40 of the 52 features (77% of the total list). A noticeable gap appears between these and *WebEx* for the Macintosh Platform, which promises only 36 (69%) of the 52 desired features.

Despite the lower number of features offered by *WebEx* for Macintosh, the top two most important features, application sharing and file transfers between presenter and participants, are present and robust in their execution. *WebEx* appears to offer greater support for Macintosh OS 9 than either of the other two real-time meeting software vendors. Hands-on testing of all three packages reveals that none of the three truly offers a "ready-for-prime-time" version of their software that will run on Macintosh OS 9. In other words, for Macintosh users to get the best performance from any of these packages, they must upgrade to Macintosh OS X. Thus all three fail to meet our initial "cross platform" requirement. However, they each are still better in supporting Macintoshes using either OS 9 or OS X, than the synchronous meeting components of the collaboration/knowledge management packages reviewed later.

*Virtual Design Net* offers a unique approach to “voice over Internet.” In most “voice over Internet” packages, IP Telephony is only half-duplex, creating a degradation in quality because only one party can speak at a time. *Virtual Design Net* has designed a way to offer full duplex IP Telephony with delays roughly equivalent to a cell phone, but most other vendors do not offer this level of performance for IP Telephony at this time.

*Virtual Design Net* is also the only vendor able to display multiple video images from all the participants on the screen at the same time. In some online meetings, this may not matter. It is a useful feature when the group is small, the participants are unknown to one another, and the desire to “bond” is high.

*WebEx* has built an international switched network infrastructure with nine data center hubs. When participants dial into a meeting, they are automatically connected to the data center nearest them. This network provides a high level of security and improves the chances of consistent service quality and “dial-tone reliability.” The full spectrum of capabilities offered by this switched network approach is difficult to match using the older database centric store-and-forward technology relied on by competitive vendors.

#### **Data/File Sharing, Knowledge Management, Virtual Collaboration Software**

A comparison of the top three contenders in the data/file sharing, knowledge management, virtual collaboration category (asynchronous) revealed the following:

*LiveLink* has the highest number of desired features (49 out of 51, or 96% of the total list). *Intraspect* has the next highest number of features (47 out of the 51, or 92% of the total list). The *eRoom* package has 39 of the 51 features (77% of the total list).

The *eRoom* package stresses the collaborative workspace as its preferred metaphor for the user interface. It encourages users to visit this collaborative space for discussions and document sharing. It provides easy drag and drop file and folder organization.

*Intraspect* has a powerful search and subscription engine that allows users to quickly find all objects within the system that meet the user’s search criteria and then to be notified on an ongoing basis when new objects are added or old ones are modified that match the saved search string. A sales team might use this feature to manage prospects in a way that avoids duplication and keeps everyone up to date.

*Intraspect* uses email as the metaphor for its user interface making it less of a challenge for inexperienced users to learn to use the system. It is possible to interact with *Intraspect* entirely from a user’s email client.

*LiveLink* is a robust document management and knowledge management tool that offers a basic collaborative space and a basic email interface. However, *LiveLink* has a number of modules that provide additional functionality by enhancing the search and subscription capabilities, email interface, and virtual collaboration work space. The competition is hard pressed to offer the power and flexibility of the core *LiveLink* product when it is combined with several of the optional modules. This power and flexibility comes at a price, however. While the core *LiveLink* product is

competitively priced, when you add modules, it can become more expensive than any of its competitors. The buyer must decide whether the extra power is worth the price.

### **Knowledge Management/Virtual Collaboration Case Studies**

Three case studies illustrate the types of considerations an organization may go through in the process of choosing a collaboration/knowledge management tool. These stories are based on interviews with real organizations actually using these collaborative products. Even so, the complexity of factors and the evolution of the products themselves would recommend against using these examples as a replacement for making a fully informed decision that takes the unique needs of your organization into consideration.

FutureU strongly recommends a carefully planned and implemented evaluation process for any organization contemplating the adoption of a data/file sharing, knowledge management and/or virtual collaboration tool, whether or not you decide to hire FutureU to assist you with this process.

#### **Company A**

**User Audience:** 20,000+ Sales Force made up of Account Teams of up to 50 users each

**Focus:** Simple Collaboration Knowledge Management

**Driving Force Behind Acquisition of Tool:** "need to support geographically distributed sales force"

**Approach:** 4-month live test

**LiveLink:** "Strength lies in work flow." in following defined work flow processes, works well with those who spend a lot of time at a PC or work station, those who are process savvy, those who used organized structured processes in their work

**Intraspect:** "Strength lies in email interface." Among the sales force, email is the major currency of exchange. Using email is a behavior they understand. Sales reps not highly structured, don't like administration, if it takes more than 30 seconds to do something online, they won't do it.

**Choice:** Intraspect

**Reasons:** "More malleable and customizable." Easily changed discussions to FAQs. Used "Ask the Expert" approach with response guaranteed within 24 hours.

#### **Company B**

**User Audience:** 500+ employees, 3 physical locations, 100+ external personnel

**Focus:** Collaboration and Knowledge Management

**Driving Force Behind Acquisition of Tool:** "increasingly moving processes from paper based, hall, telephone to web—so need tools to enable these processes"

**Approach:** comparison of 40+ packages, trimmed down to 6, demos, 2 finalists chosen hands-on tests run.

<i>LiveLink</i>	<i>Intraspect</i>
Large customer base	Small company – good response time and quality interactions
Content viewer (200+ file types)	Requires native applications for all content viewing/access
Strong roadmap for scalability and features support	Unclear roadmap for scalability
Limited local presence	Local
Addressing objects with email requires add-on module	E-mail addressing for all objects
Customization required for our applications	Pre-built templates for business functions
Development possible in Java, VB, C++ and other standards	Development in Java only.
Greatest strength in knowledge management	Greatest strength is in collaboration
Large, well established user group	Smaller user group
Older, larger company	Newer, smaller company

**Choice:** *LiveLink*

**Reasons:** "Better RFP, better demo, fewer issues, stronger feature set, more mature product, more customers, publicly held company."

### Company C

**User Audience:** 200+ users scattered about the globe in teams of up to 30 users each

**Focus:** document management and collaboration around documents

**Driving Force Behind Acquisition of Tool:** "current system (*LiveLink*, Ver. 8) degrading in performance with increasing size of databases"

**Approach:** internal review of existing tools that might be applied to solving problem at reduced costs

**Choice:** *Intraspect* for collaboration with *LiveLink* integrated in for document management

**Reasons:** "*Intraspect* able to replace several of our custom *LiveLink* applications more cheaply than upgrading *LiveLink*. Users found *Intraspect* email interface easier to use than eLink email module of *LiveLink*. By integrating the two together we get both of their strengths in one system."

It's easy to see, even from just these few cases, that as we stated before satisfaction with any single software product is highly subjective and each organization has reasons for its choices that are unique to the situation, the people, and the company.

## **Pricing**

It is safe to say there is no pricing standard among collaboration software vendors—even between similar products that occupy a limited niche, such as real-time meeting software, where the features are basically the same among all competitive packages. In fact, the way price is calculated varies dramatically from vendor to vendor. Pressure from customers and competitors also influences pricing. For these reasons, and because price typically drops as any new industry matures, specific price comparisons are not included in this report; they would rapidly lose meaning. More useful to the buyer in such a rapidly changing environment are the key factors to consider in evaluating the cost of acquiring and implementing a collaborative software package.

The six top pricing factors to consider are 1) installation charges, 2) delivery model, 3) training fees, 4) annual maintenance fees, 5) customization costs, and 6) the potential for price flexibility.

### **Installation Charges**

Rarely will a collaborative software vendor include installation charges in the quoted retail price of the product. Instead, most vendors charge a separate fee, typically calculated as a small percentage of the agreed upon product price. Often this amounts to no more than a few thousand dollars. The installation process usually involves help in branding the site to match the purchasing organizations current brand and some minor customizations of the software. If purchasing a server license, installation on the server is usually included in the installation charges, but again, not in the quoted product price.

### **Delivery Model**

The two basic delivery models for collaboration software are server software (a software license) and a hosted application service (Application Service Provider or ASP). Most vendors offer a software license, but some vendors, *WebEx* for example, offer only ASP model. Some offer the choice of either. Often the delivery model is constrained by the number of people that can access the software at a given time. Many vendors describe this as a “per-seating” charge. Usually, the price per seat goes down as more seats are purchased.

### **Training Fees**

Training fees are sometimes built in to the overall price and sometimes broken out. Most vendors offer an introductory training package of some sort that costs under \$1,000 per person per day. For an additional fee, most vendors provide training beyond the introductory package, often targeting the needs of certain user groups, such as IT specialists or system administrators.

### **Annual Maintenance Fees**

When a software license is purchased, it usually also involves an annual maintenance/service fee that runs between 15% and 25% of the original license cost. Discounts are usually offered for multiple-year purchases.

### **Customization Costs**

Most vendors are willing to customize the software to meet a customer's specific needs. However, beyond some simple customization that is usually included in the installation charges, this will cost extra. Some vendors simply quote a per-hour fee for customization, while others work with the customer to specify the need and then quote a project price for that particular adaptation.

A few vendors, such as *LiveLink*, have had such extensive experience with customization that they have created a menu of modules that perform different popular functions. This allows their customers to choose only those functions they actually need, at a reduced cost.

Some customers may have sufficient IT resources to contemplate doing their own, in-house customizations. When this is the case, it is important to determine whether the product being considered allows customization through a common development language. If not, and the IT staff must learn a proprietary language to get the job done, the ultimate cost may exceed what the vendor would charge.

### **Price Flexibility**

FutureU's experience in facilitating cost estimates with a wide variety of vendors has shown that most vendors in the collaborative software arena are extremely flexible about pricing. If a customer requires a software package to serve, say, several hundred to several thousand users, the vendor tends to respond positively when told the limits of the budget. We have seen retail prices for real-time meeting software drop from \$200 per seat per month to as low as \$85 for 500 to 1,000 seats. Similarly, we have seen knowledge management/collaboration software that starts out at \$800 or even \$1,000 per seat drop down to \$200 a seat for an initial license of 800 to 1,000 seats. This flexibility is especially evident when the prospective customer shows the potential for a larger sale in the future.

## Data Tables

Table 1 in Appendix 1 compares the three real-time meeting products on each of the 52 features within the 7 key subcategories: communications features, sharing features, presentation features, event management, deliver/user interface features, management and administration, training and support, and sales model. Figure 1 below, summarizes these results.

**Figure 1. Real-Time Meeting Software- Number of Features Out of Total of 52.**

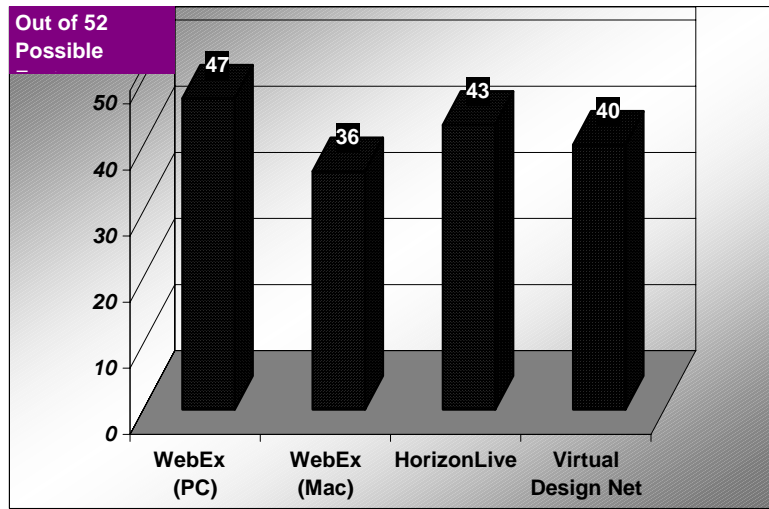
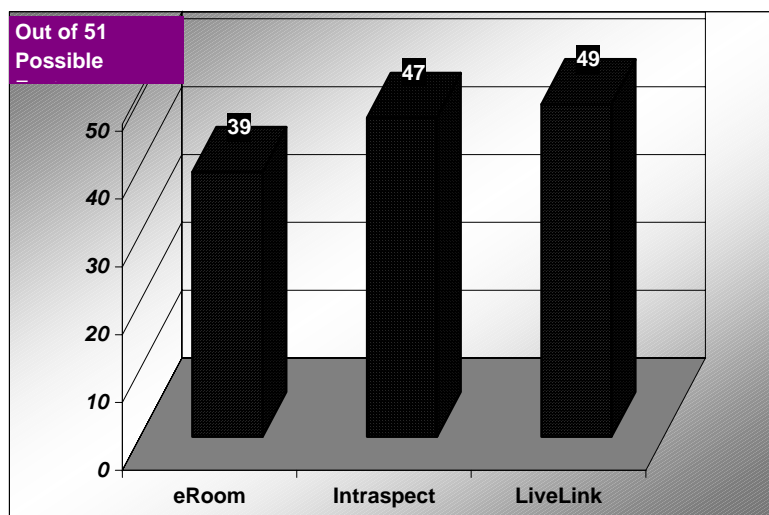


Table 2 in Appendix 1 compares the three asynchronous virtual collaboration products on each of the 51 features within the 7 key subcategories: communication features, document/file sharing, work organization, deliver/user interface, management and administration, training and support, and sales model. Figure 2 below summarizes these results.

**Figure 2. Collaboration/Knowledge Management Software - Number of Features Out of Total of 51.**



## Appendix 1. Data Tables

**Table 1. Real-Time Meeting Software**

Table 1. Real-Time Meeting Software.	WebEx		HorizonLive	Virtual Design Net
	PC	Mac		
.	.	.	.	.
<b>Collaboration Features</b>	.	.	.	.
<i>Communications Features</i>	.	.	.	.
Chat/Instant Messaging (Internal-Intranet)	0	0	1	1
Chat/Instant Messaging (External-Internet)	1	1	1	0
Audio (Interactive)	1	1	1	1
Audio (One Way Only)	1	0	1	1
Video (Interactive)	0	0	0	1
Video (One Way Only)	1	1	1	1
Teleconferencing (Phone)	1	1	1	0
Teleconferencing (IP Telephony)	1	0	1	1
Leader's Video Image	1	1	1	1
Participant's Video Images	0	0	0	1
Online Surveying, Polling	1	1	1	0
Question/Comment (Raised Hand) indicator	1	1	1	1
.	.	.	.	.
<i>Sharing Features</i>	.	.	.	.
Presenter Can Access a Computer Remotely	1	0	0	0
Web Browser Sharing	1	1	1	1
Application Viewing and Sharing	1	1	1	1
Desktop Viewing and Sharing	1	1	1	1
Transfer Files between Presenter and Participants	1	1	0	0
.	.	.	.	.
<i>Presentation Features</i>	.	.	.	.
Whiteboard	1	0	1	1
Annotations	1	1	1	1
PPT Slides, Animations, Full Screen View	1	0	1	1
Multiple Presentations	1	0	1	1
Share View of Other Images (jpeg, gif, etc)	1	0	1	1
Presenter-Guided Internet Tours	1	0	1	1
Web Content Push	1	1	0	0
Presentation/Meeting Recording/Playback	1	0	1	0
Record and Playback Editor	1	0	0	0
Shared Presentation/Facilitation	1	0	1	1
.	.	.	.	.
<i>Event Management</i>	.	.	.	.
Automated Invitations	1	1	0	1
Who's Present Indicator	1	1	1	1
.	.	.	.	.



<b>Table 1. Real-Time Meeting Software.</b>	<b>WebEx</b>		<b>HorizonLive</b>	<b>Virtual Design Net</b>
<b>Delivery/User Interface Features</b>	.	.	.	.
Desktop Access	1	1	1	1
Open Source Code	1	1	0	0
Open Standards	1	1	1	1
Bandwidth Independent (e.g. automatic detection of connection speed)	1	1	1	1
Platform Independent (minimum=Windows 98 + Mac OS 9 + Unix/Linux)	1	1	1	1
Wireless Access	1	1	1	1
ODBC compliant	1	1	1	1
.	.	.	.	.
<b>Management and Administration</b>	.	.	.	.
Reporting	1	1	1	0
Archiving	1	1	1	1
Security (Secure Socket Layer-SSL, VPN, Password access, etc.)	1	1	1	1
Scalable	1	1	1	1
.	.	.	.	.
<b>Training and Support</b>	.	.	.	.
Software Installation	1	1	1	1
Hardware Installation	0	0	1	1
Company-Wide Deployment	1	1	1	1
Largest Current Deployment	thousands	thousands	1,800	1,200
Help Desk	.	.	.	.
Phone/Work Days/Work Hours	1	1	1	1
Phone 24/7	1	1	0	0
Email or Online	1	1	1	1
Training (For leaders/facilitators)	1	1	1	1
Training (For participants)	1	1	1	1
Manual	1	1	1	1
.	.	.	.	.
<b>Sales Model</b>	.	.	.	.
Site License	0	0	1	0
ASP Model	1	1	1	1
Free Trial (negotiable)	1	1	1	1
.	.	.	.	.
<b>Total Number of Features (out of 52 possible)</b>	<b>47</b>	<b>36</b>	<b>43</b>	<b>40</b>
<b>Percentage of Total Number of Features</b>	<b>90.4%</b>	<b>69.2%</b>	<b>82.7%</b>	<b>76.9%</b>

**Table 2. Data and File Sharing, Knowledge Management, Collaboration Software**

Table 2. Data and File Sharing, Knowledge Management, Collaboration Software	eRoom	Intraspect	LiveLink
<b>Collaboration Features</b>			
<i>Communication Features</i>			
Bulletin Board/Announcements	1	1	1
Discussion Forums	1	1	1
E-Mail (built in)	1	1	1
E-Mail (Web-based)	1	1	1
Group Tools (circulation, discussion, etc.)	1	1	1
<i>Document/File Sharing Features</i>			
Attachments (email or conference posting)	1	1	1
Upload/Download to File Sharing Site	1	1	1
Document Version Tracking	1	1	1
Document Format Conversion	0	0	1
Document Indexing/TOC	1	1	1
Shared Image Gallery	1	1	1
<i>Work Organization Features</i>			
KnowledgeBase (Automatic Database Storage and Indexing)	0	1	1
Subscriptions/Notification of changes to Knowledge Base	0	1	1
Calendaring/Scheduling	1	1	1
Due Date Reminders	1	1	1
Invitations to Events/Meetings	1	1	1
Schedule Facilities (meeting rooms, etc.)	0	1	1
Project Management Tools	1	1	1
Team Workspace	1	1	1
Workflow Diagrams	1	1	1
Task Management (Assignments, priorities, due dates, etc.)	1	1	1
Hyperlinked Org Char	0	1	0
Hyperlinked Directory	0	1	1
My Page/Dashboard View	1	1	1
<b>Delivery/User Interface Features</b>			
Desktop Access	1	1	1
Open Source Code	0	0	0
Open Standards	1	1	1
Bandwidth Independent	1	1	1
Platform Independent (minimum=Windows 98 + Mac OS 9 + Unix/Linux)	1	1	1
Technical Requirements/Compatibility Client			
Windows	1	1	1
Macintosh	1	1	1
Unix/Linux	0	0	1
Other (e.g. Cray, Solaris)	0	1	1
Wireless Access	1	1	1

<b>Table 2. Data and File Sharing, Knowledge Management, Collaboration Software</b>	<b>eRoom</b>	<b>Intraspect</b>	<b>LiveLink</b>
ODBC compliant	0	1	1
.			
<b>Management and Administration</b>			
Reporting	1	1	1
Archiving	1	1	1
Security (Secure Socket Layer-SSL, VPN, Password access, etc.)	1	1	1
Scalable	1	1	1
.			
<b>Training and Support</b>			
Software Installation	1	1	1
Hardware Installation	NA	1	1
Company-Wide Deployment	1	1	1
Largest Current Deployment	thousands	thousands	100,000+
Help Desk			
Phone/Work Days/Work Hours	1	1	1
Phone 24/7	0	1	1
Email or Online	1	1	1
Training (For leaders/facilitators)	1	1	1
Training (For participants)	1	1	1
Manual	1	1	1
.			
<b>Sales Model</b>			
Site License	1	1	1
ASP Model	1	1	1
Free Trial	negotiable	0negotiable	
.			
<b>Total Number of Features (out of 51 possible)</b>	<b>39</b>	<b>47</b>	<b>49</b>
<b>Percentage of Total Number of Features</b>	<b>76.5%</b>	<b>92.2%</b>	<b>96.1%</b>

## Appendix 2 . Articles, Books and Web Sites Searched in This Study

Collaboration and Knowledge Management Resource Center	<a href="http://www.collaboration-tools.com/">http://www.collaboration-tools.com/</a>
Developing an ROI for Collaboration Projects or Programs	<a href="http://www.collaborate.com/publication/newsletter/publications_newsletter_nov01.html">http://www.collaborate.com/publication/newsletter/publications_newsletter_nov01.html</a>
Electronic Whiteboard Kits	<a href="http://www.pcworld.com/top400/article/0%2C1361%2C15364%2C00.html">http://www.pcworld.com/top400/article/0%2C1361%2C15364%2C00.html</a>
Local effort to enhance software (virtual teaming at NCR)	<a href="http://dayton.bcentral.com/dayton/stories/2001/11/19/story8.html">http://dayton.bcentral.com/dayton/stories/2001/11/19/story8.html</a>
Virtual Meeting Places	<a href="http://www.cnet.com/software/0-3227891-8-8254522-1.html?tag=ld">http://www.cnet.com/software/0-3227891-8-8254522-1.html?tag=ld</a>
Who Cares About Office Collaboration	<a href="http://www.pcworld.com/news/article/0.aid.14358.00.asp">http://www.pcworld.com/news/article/0.aid.14358.00.asp</a>
Collaboration, Knowledge Representation and Automatability	<a href="http://www.w3.org/Collaboration/">http://www.w3.org/Collaboration/</a>
The CoWorking Institute	<a href="http://www.coworking.com/">http://www.coworking.com/</a>
MCAD Café (mechanical design community)	<a href="http://www.mcadcafe.com/">http://www.mcadcafe.com/</a>
about.com: Internet Conferencing	<a href="http://search.about.com/fullsearch.htm?terms=Internet%20Conferencing">http://search.about.com/fullsearch.htm?terms=Internet%20Conferencing</a>
World Web Cam Guide	<a href="http://www.world-webcam-guide.com/resource/webcam/buytheguide">http://www.world-webcam-guide.com/resource/webcam/buytheguide</a>
Pure Mac Internet Phones	<a href="http://www.pure-mac.com/intphone.html">http://www.pure-mac.com/intphone.html</a>
Business Collaborator	<a href="http://www.businesscollaborator.com/">http://www.businesscollaborator.com/</a>
New Focus on Collaboration Software	<a href="http://www.informationweek.com/story/IWK20020617S0008">http://www.informationweek.com/story/IWK20020617S0008</a>
Collaboration Software is More than Just Email	<a href="http://www.ovum.com/go/ovumcomments/016321.htm">http://www.ovum.com/go/ovumcomments/016321.htm</a>
Collaboration Software: Evolution and Revolution	<a href="http://www.ovum.com/go/content/016117">http://www.ovum.com/go/content/016117</a>
Collaboration Software	<a href="http://www.tenlinks.com/CAD/PRODUCTS/collaboration.htm">http://www.tenlinks.com/CAD/PRODUCTS/collaboration.htm</a>
Network Computing E-Poll Results: Collaboration Software	<a href="http://www.networkcomputing.com/1304/1304f14.html">http://www.networkcomputing.com/1304/1304f14.html</a>
Open Directory Project: Collaboration Software	<a href="http://dmoz.org/Reference/Knowledge_Management/Knowledge_Flow/Collaboration/Software/">http://dmoz.org/Reference/Knowledge_Management/Knowledge_Flow/Collaboration/Software/</a>
Open Directory Project: Knowledge Management	<a href="http://dmoz.org/Reference/Knowledge_Management/">http://dmoz.org/Reference/Knowledge_Management/</a>
Open Directory Project: Groupware	<a href="http://dmoz.org/Computers/Software/Groupware/">http://dmoz.org/Computers/Software/Groupware/</a>
InfoWeek: Collaboration Software with a Familiar Look and Feel	<a href="http://www.informationweek.com/story/IWK20011206S0011">http://www.informationweek.com/story/IWK20011206S0011</a>
Google Search: Groupware	<a href="http://directory.google.com/Top/Computers/Software/Groupware/">http://directory.google.com/Top/Computers/Software/Groupware/</a>
E-Week: Making It Easier	<a href="http://www.eweek.com/article2/0.3959.13079.00.asp">http://www.eweek.com/article2/0.3959.13079.00.asp</a>
Technology Options for Online Collaboration	<a href="http://www.cvm.tamu.edu/wklemm/collab.htm">http://www.cvm.tamu.edu/wklemm/collab.htm</a>

## Appendix 3: The Universe of Collaborative Software (a sampling of the hundreds of products available)

Product	URL
<b>Knowledge Building/Management</b>	
ArsDigita (cross platform)	<a href="http://www.arsdigita.com/">http://www.arsdigita.com/</a>
Documentum (cross platform)	<a href="http://www.documentum.com/">http://www.documentum.com/</a>
<i>ERoom</i>	<a href="http://www.eRooms.com/">http://www.eRooms.com/</a>
<i>Intraspect</i> (cross platform)	<a href="http://www.Intraspect.com/">http://www.Intraspect.com/</a>
<i>LiveLink</i> (cross platform)	<a href="http://www.opentext.com/">http://www.opentext.com/</a>
WebSpace	<a href="http://www.copernus.com/">http://www.copernus.com/</a>
<b>Communication</b>	
<b>Video Conferencing</b>	
<b>Room Based</b>	
Avistar Video Applications	<a href="http://www.avistar.com/products.cfm/avistar/video_apps.html">http://www.avistar.com/products.cfm/avistar/video_apps.html</a>
Click To Meet	<a href="http://www.cuseeme.com/">http://www.cuseeme.com/</a>
PictureTel	<a href="http://www.picturetel.com/products/default.htm">http://www.picturetel.com/products/default.htm</a>
Polycom iPower Products	<a href="http://www.polycom.com/products/video_family.html">http://www.polycom.com/products/video_family.html</a>
Tandberg Videoconferencing Solutions (dual screen monitors, cameras, etc.)	<a href="http://www.tandberg.net/">http://www.tandberg.net/</a>
VRVS (cross platform) (Virtual Rooms Video Conferencing System)	<a href="http://www.vrvs.com/">http://www.vrvs.com/</a>
<b>Desktop Based</b>	
CUSEeMe (cross platform)	<a href="http://www.cuseeme.com/products/cuseeme5.htm">http://www.cuseeme.com/products/cuseeme5.htm</a>
GroupVille (cross platform)	<a href="http://www.groupville.com/">http://www.groupville.com/</a>
ISPQ Video Chat (cross platform)	<a href="http://www.ispq.com/">http://www.ispq.com/</a>
iVisit (cross platform)	<a href="http://www.ivisit.com/">http://www.ivisit.com/</a>
Video Link Pro (cross platform)	<a href="http://www.smithmicro.com/">http://www.smithmicro.com/</a>
<b>Internet Presentations/Meetings</b>	
iMeet (cross platform)	<a href="http://www.imeet.com/">http://www.imeet.com/</a>
MeetingBias (cross platform)	<a href="http://www.meetingbias.com/">http://www.meetingbias.com/</a>
The Virtual Meeting (cross platform)	<a href="http://www.rtz.com/products/TheVirtualMeeting/index.html">http://www.rtz.com/products/TheVirtualMeeting/index.html</a>
WebEx (cross platform)	<a href="http://www.WebEx.com/">http://www.WebEx.com/</a>
Accerra (Mac promised by 4/2002)	<a href="http://www.accerra.com/">http://www.accerra.com/</a>
<b>Conferencing</b>	
Beeboard	<a href="http://www.beebalm.com/">http://www.beebalm.com/</a>
Caucus (cross platform)	<a href="http://www.caucuscare.com/">http://www.caucuscare.com/</a>
Facilitate Conferencing Tools	<a href="http://facilitate.com/">http://facilitate.com/</a>
Ikonboard	<a href="http://www.ikonboard.com">http://www.ikonboard.com</a>
Motet	<a href="http://www.motet.com/html/intro.html">http://www.motet.com/html/intro.html</a>
PageSeeder (mac os 10 only)	<a href="http://www.pageseeder.com">http://www.pageseeder.com</a>
Ultimate Bulletin Board	<a href="http://www.ultimatebb.com/">http://www.ultimatebb.com/</a>
Web Crossing (WebX)	<a href="http://www.webcrossing.com/">http://www.webcrossing.com/</a>

Product	URL
Well Engaged	<a href="http://www.wellengaged.com">http://www.wellengaged.com</a>
WWWBoard	<a href="http://www.worldwidemart.com/scripts/wwwboard.shtml">http://www.worldwidemart.com/scripts/wwwboard.shtml</a>
Yahoo Groups (cross platform)	<a href="http://yahoogroups.com/">http://yahoogroups.com/</a>

### Instant Messenger/Internet Relay Chat/Chat

AOL Instant Messenger	
ISPQ Video Chat (cross platform)	<a href="http://www.ispq.com/">http://www.ispq.com/</a>
Netscape Instant Messenger	
Yahoo Instant Messenger	

### Collaboration

#### Collaboration Portals (full featured)

BrightSuite (cross platform)	<a href="http://www.dcasoft.com/bspromo2/">http://www.dcasoft.com/bspromo2/</a>
Cybozu Virtual Office (cross platform)	<a href="http://cybozu.com/products/index.html">http://cybozu.com/products/index.html</a>
Egos Collaborator (cross platform)	<a href="http://www.egos.com/">http://www.egos.com/</a>
eRoom (cross platform)	<a href="http://www.eRoom.com/">http://www.eRoom.com/</a>
GoToMyPC, DeskTop Streaming, ExpertLive (cross platform)	<a href="http://www.expertcity.com/">http://www.expertcity.com/</a>
iCohere (cross platform)	<a href="http://www.icohere.com/">http://www.icohere.com/</a>
Intranets (cross platform)	<a href="http://www.intranets.com/">http://www.intranets.com/</a>
IntraSmart (cross platform)	<a href="http://www.mindbridge.com/">http://www.mindbridge.com/</a>
LearningBias (cross platform)	<a href="http://www.netbias.net/">http://www.netbias.net/</a>
LiveLink (cross platform)	<a href="http://www.opentext.com/">http://www.opentext.com/</a>

Lotus Domino (cross platform)	<a href="http://www.lotus.com/home.nsf/welcome/domino">http://www.lotus.com/home.nsf/welcome/domino</a>
Lotus Notes (cross platform)	<a href="http://www.lotus.com/home.nsf/welcome/notes">http://www.lotus.com/home.nsf/welcome/notes</a>
netVillage.com (cross platform)	<a href="http://www.netvillage.com/">http://www.netvillage.com/</a>
Project.net (cross platform)	<a href="http://www.project.net/">http://www.project.net/</a>
Lotus Quickplace (cross platform)	<a href="http://www.lotus.com/home.nsf/welcome/quickplace">http://www.lotus.com/home.nsf/welcome/quickplace</a>
Web Council	<a href="http://www.webcouncil.com/">http://www.webcouncil.com/</a>
WebSpace (cross platform)	<a href="http://www.copernus.com/">http://www.copernus.com/</a>
WebX - Team Crossing (cross platform)	<a href="http://www.webcrossing.com/">http://www.webcrossing.com/</a>
Virtual Teams	<a href="http://www.virtualteams.com/">http://www.virtualteams.com/</a>

#### Document Sharing/Collaboration

Adobe Covia (cross platform)	<a href="http://adobe.covia.com/adobeweb/">http://adobe.covia.com/adobeweb/</a>
BrightStar (cross platform)	<a href="http://www.dcasoft.com/">http://www.dcasoft.com/</a>
KnowledgeDisk (cross platform)	<a href="http://www.knowledgedisk.com/">http://www.knowledgedisk.com/</a>

#### Whiteboard Capture

eBeam	<a href="http://www.e-beam.com">http://www.e-beam.com</a>
Mimio	<a href="http://www.mimio.com">http://www.mimio.com</a>

#### Whiteboard Projection Interface

SmartBoard	<a href="http://www.smarttech.com/products/index.html">http://www.smarttech.com/products/index.html</a>
TeamBoard	<a href="http://www.whiteboard.com/">http://www.whiteboard.com/</a>

Product	URL
<b>Project Management for Teams</b>	
Phorum	<a href="http://www.phorum.org/">http://www.phorum.org/</a>
Pixion's Picture Talk	<a href="http://www.pixion.com/">http://www.pixion.com/</a>
TeamOn ( service provider)	<a href="http://www.teamon.com/home.html">http://www.teamon.com/home.html</a>
Virtual Teams	<a href="http://www.virtualteams.com/">http://www.virtualteams.com/</a>
Web-4M	<a href="http://www.jdhtech.com/">http://www.jdhtech.com/</a>
<b>Calendar/Scheduling</b>	
Calcium	<a href="http://www.brownbears.com/">http://www.brownbears.com/</a>
Corporate Time Calendar (cross platform)	<a href="http://www.centrapoint.com/calendar.shtml">http://www.centrapoint.com/calendar.shtml</a>
Franklin Internet Planner	<a href="http://www.planner.com/">http://www.planner.com/</a>
Hunt Calendars	<a href="http://www.huntcal.com/">http://www.huntcal.com/</a>
Meeting Maker	<a href="http://www.meetingmaker.com/">http://www.meetingmaker.com/</a>
PowerCal+	<a href="http://www.sigmaxweb.com/powercal.html">http://www.sigmaxweb.com/powercal.html</a>
WebEvent (cross platform)	<a href="http://www.webevent.com/">http://www.webevent.com/</a>
<b>Distance Learning Tools</b>	
Blackboard	<a href="http://www.blackboard.com/">http://www.blackboard.com/</a>
FirstClass	<a href="http://www.softarc.com/">http://www.softarc.com/</a>
FirstClass Collaborative Classroom Gold	<a href="http://www.softarc.com/">http://www.softarc.com/</a>
LearningBias (cross platform)	<a href="http://www.netbias.net/">http://www.netbias.net/</a>
LearningSpace (cross platform)	<a href="http://www.lotus.com/home.nsf/welcome/learnspace">http://www.lotus.com/home.nsf/welcome/learnspace</a>
<b>Other Tools/Resources</b>	
<b>Unclassified</b>	
WebLine	<a href="http://www.webline.com/">http://www.webline.com/</a>
WebSentric	<a href="http://www.websentric.com/">http://www.websentric.com/</a>
<b>Event Management</b>	
Acteva	<a href="http://www.acteva.com">http://www.acteva.com</a>
Cvent	<a href="http://www.cvent.com/">http://www.cvent.com/</a>
Evite	<a href="http://www.evite.com">http://www.evite.com</a>
<b>File Sharing/Storage</b>	
Freediskspace	<a href="http://www.freediskspace.com/">http://www.freediskspace.com/</a>
Freedrive	<a href="http://www.freedrive.com/">http://www.freedrive.com/</a>
I-Drive	<a href="http://www.i-drive.com/">http://www.i-drive.com/</a>
<b>CAD Sharing/Collaboration</b>	
ConceptStation (free trial)	<a href="http://www.realitywave.com/products-cs.asp">http://www.realitywave.com/products-cs.asp</a>
eDrawings Professional	<a href="http://www.solidworks.com/edrawings/">http://www.solidworks.com/edrawings/</a>
Magics Communicator	<a href="http://www.materialise.com/">http://www.materialise.com/</a>
<b>Decision Support</b>	
Accord (Decision Support)	<a href="http://www.robustdecisions.com/software.html">http://www.robustdecisions.com/software.html</a>
Consensus Builder	<a href="http://www.consensusbuilder.com/">http://www.consensusbuilder.com/</a>
<b>Remote Computer Control</b>	

	Product	URL
	Timbuktu	<a href="http://www.netopia.com/">http://www.netopia.com/</a>
	<b>IT Training Content</b>	
	Digital Think	<a href="http://www.digitalthink.com/">http://www.digitalthink.com/</a>
	NETg	<a href="http://www.netg.com/">http://www.netg.com/</a>
	SmartForce	<a href="http://www.smartforce.com/">http://www.smartforce.com/</a>
	SmartPlanet	<a href="http://www.smartplanet.com/">http://www.smartplanet.com/</a>