eReview

Web4

eReview
White Paper

REAL-TIME WEB-BASED DOCUMENT CENTRIC COLLABORATION ACROSS THE ENTERPRISE

...bringing people and documents together

VIEW   CONFERENCE

MARKUP   COLLABORATE

eReview bridges the gap between document viewing technologies and generic Web-based conferencing technologies with best for breed features for real-time collaboration and decision making across the enterprise.

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eReview Overview

The development of the Internet and concurrent advances in Information Technology have redefined the fundamentals of enterprise information exchange and altered the institutions and mechanisms for the delivery of products and services forever. Collaboration has joined the ranks of integration and automation as a benchmark of business innovation and a hallmark of competitive advantage. Indeed, participation in this paradigm shift in new technology is rapidly becoming a *de facto* standard for both public and private sector service providers. Private sector business entities have seen a fundamental shift in the concept, manner and method by which they will acquire market share and deliver services. This new methodology of administration, when applied to local, state and federal activity, is commonly called Electronic Governance or eGovernance. Inherent in this new technology is the recognition that dispersed knowledge contained within various domains – physical and otherwise – is a scarce resource. It must be captured and integrated in a manner that then allows for its timely use in documentation and business processes that underlie the delivery of these products and services.

When done properly, a knowledge management deployment can be extremely valuable to an organization. But given all the knowledge management solutions currently available in the market – how does one begin to develop an effective knowledge management system?

The basis of effective knowledge management is the ability to leverage an organization's collective expertise, which is typically diffused both in terms of the nature of the information medium and its physical location. This expertise exists within two distinct sources: tacit knowledge or know-how (that which is elusive and collectively held in the brains and experiences of others), and explicit or recorded knowledge (documents, forms, policies, etc.). It is extremely difficult to manage the brains and experiences of others, but it is possible to manage the recorded knowledge generated by others. The key to starting a knowledge management initiative, therefore, is to fully leverage the knowledge contained in users' documents and files.

Due to limitations of today's standard file management systems, information often becomes lost in a sea of documents. Furthermore, many of today's enterprise file systems, such as Windows Explorer, provide insufficient collaboration functionality and poor or non-existent coordination of review and approval cycles.

A robust flexible Document Management Technology (DMT) system harnesses the knowledge contained in documents and enables effective collaboration and a resulting time and cost savings. It also manages ad hoc documents - the ones currently stored on shared drives as well as individual PCs. Cutting-edge DMT systems provide the ability to manage and share documents with internal employees and external

The immediate ROI benefits of the application include the following:

- Reduces project and product development time and cost drastically by empowering teams to share ideas, respond to changes quickly.
- Reduces travel costs, as geographically dispersed teams can meet in online review sessions.
- Centralized communication.
- Ability to store and retrieve both structured (documents) and ad hoc ideas (meetings).
- Better quality control.
- Cross platform, server-centric solution, runs on all flavors of UNIX, Windows, red Hat Linux and MAC-OS/X.
- Comes ready with a web server, which is installed along with eReview during installation. Works with all web servers and web application servers like MS-IIS, Java Web Server, apache Weblogic, Websphere etc.

Conclusion

In order to meet the demands of the global market, the main focus of any organization should be the minimization of expenditure and optimum usage of time. Effective content management in any domain essentially requires coordination and collaboration of information coupled with real time communication In every successful company, suppliers, vendors, partners, and customers make up "virtual organizations" or value chains. Global collaboration among all members of the "value-chain" during the product or project demands that they have proper access to all information and documents when they require it – in the correct version – irrespective of where the persons or the documents are located.

From its initial years of evolution eReview has come a long way. Today it boasts of being a product that is reliable, robust and secure; a product that caters to multifarious business needs, specifically designed to keep business agile, collaborative, and at the same time secure. The primary focus of Web4 lies in delivering cost-effective streamlined services and solutions that ensure optimal performance and in helping its esteemed clients obtain and sustain a competitive excellence. In the final reckoning, the fact remains that eReview not only strives to automate business, it also revamps and reengineers the policy formulation and decision-making cycles in an organization by making the document review procedures more effective and responsive.

Each markup object is associated with a markup layer object. Markup layer object identifies the ownership of the markup. That is why it is easier for eReview to have multiple markup layers, owned by different authors, within the same markup file. Markups are also time-stamped to recognize the creation time.

Conferencing Tools:

Fig - 6

eReview has a number of collaboration tools that ensures smooth real-time/asynchronous meetings sessions between people dispersed across the globe. Fig-6 depicts the standard conferencing tools in eReview. What sets eReview apart from other view and markup software is that it offers a complete Web-based meeting and conferencing system.

The following are the salient features of eReview's conferencing features:

- Application and desktop sharing enables meeting participants to view and control applications as well as desktops running on a remote participant's desktop.
- Meeting participants can jointly view and annotate multiple documents, 2D drawings and 3D CAD models intelligently in real-time.
- Chat, whiteboard and roaming features.
- Shared Cursor and Collaborative mouse features help an attendee point to certain areas in a document so that highlighting of areas appear in all the screens.
- Multimedia presentation and animation sharing allow meeting participants to share video, animation and other static or moving presentation.
- Attendee transparency and moderator control of attendee privileges.
- Synchronous mode to ensure all participants see the same view.
- Multi-point real-time audio conferencing over HTTP.
- Multi-point real-time audio/video conferencing as an optional module.
- Ability to record and playback the entire meeting according to attendee's rights within the meeting
- Meeting messenger system to notify and invite team members through instant messaging.
- Comprehensive meeting scheduler and management system.
- Webcasting of entire eReview meeting to a large audience.
- Threaded chat markup allows one to chat around a particular portion of the drawing or document.

ROI with eReview

Implementation of eReview in an organization can immediately begin to pay dividends by shortening the decision making cycle during product or project development. The following are some examples of how a company can immediately experience fiduciary benefits from using eReview:

parties, making the organization's documents an invaluable knowledge source. Achieving this first step on the KNOWLEDGE MANAGEMENT initiative ladder, the ability to control the knowledge contained in the organization's documents and files, puts an organization on the pathway to becoming a knowledge enabled Organization.

The Internet has become a key tool in leveraging organizational knowledge through collaborative arrangements and has thus evolved from a static information repository to an interactive communications vehicle. All organizations –whether public, private or voluntary - are recognizing the need for tools of communication and collaboration to optimally use internal processes – most understand this requires secure and reliable administration. Several factors, such as the following, have contributed to an attitudinal shift driving organizations, including those within the public domain, to seek and improve their collaboration capabilities:

- Internet
- Globalization and geographically dispersed organization
- Tighter deadlines and budgets
- Constantly changing scope

Benefits of creating vibrant, interactive, online communities using these newest technologies are:

Lower cost: Better collaboration will result in same or more output at a lower total cost.
Quicker: Faster decision making, less travel, and less iterations result in same output in less time.
More Productive: eCollaboration produces more output at the same cost.
Higher Quality: produces the same output at the same total cost and time, but with higher quality standard.
More Innovative: produces new ideas and new output

All projects, whether private sector or government projects, consume significant amount of time and resources in preparing documentation and distributing documents, storing and retrieving heterogeneous data and documents, conducting and documenting meetings, and making sure that the decisions made are implemented.By combining a simple way to hold meetings and share documents live, over the Internet, with the ability to view and annotate documents, drawings, and models, and sharing applications, one can dramatically improve efficiency, productivity and accountability within the workplace and between all involved groups.

Using Web Meeting and Conferencing to Collaborate, Communicate, and Coordinate

eReview makes it possible for companies to conduct online conferences where several participants can retrieve, view and annotate documents and drawings anywhere, anytime, on any computer, in a real-time online collaborative environment. The virtual visual meetings allow geographically dispersed team members to collaborate on prototype development, design decisions, engineering change order (ECO) management or any other activity that requires that all attendees view the same set of documents or drawings and share their ideas. eReview is equipped with textual chat to facilitate interaction and conversation. It also has a conferencing option that supports both real-time audio and video amongst attendees. The chairperson or the conductor of the meeting can control the attendee's privileges to view or annotate a document. He can also allow the attendees to roam asynchronously through a set of review documents and then synchronize all attendees to view crucial comments or annotations from a team member. eReview enables selective markups or redacting, so during an on-line meeting, some parts of a document can be blocked out from certain attendees. eReview also supports textual as well as graphical markup whispering among the attendees.

The Evolution of View and Markup Technology

View and markup (redline) technology has been around for quite awhile. Early versions were DOS based or UNIX based. Most of today's versions are Microsoft Windows based with easy-to-use graphical interfaces capable of viewing a variety of file formats including raster, office, vector, CAD, as well as formats like Postscript, PDF, ZIP, etc. There are stand-alone desktop-based products that can view files from the local disk or networked file systems. Some products, like Web4/Allegria's ForReview, come Internet enabled, allowing users to enter a URL and retrieve files across the Internet for view and markup.There is a major shift occurring in the workplace paradigm. The world is moving to the Internet and thin-client technology is rapidly gaining acceptance. It is becoming much more cost-effective to run mission critical applications from a server, requiring only an Internet browser on the desktop. The availability of applications accessed through the Internet effectively eliminates the need to install, manage, update and support desktop applications across many, potentially thousands, of Personal Computers and provides these applications from anywhere at anytime.

ThereUsers of view and markup applications are quickly embracing this paradigm. There are several technologies being used to implement it. Let us focus on Internet Computing Architecture (ICA) and Java applets, the two most widely used technologies. ICA technology will Web-enable essentially any Windows-based desktop application. The desktop application resides on a server and anyone with a

- "Preview" function to handle large documents : eReview has an effective way to display the preview of the entire document. This is useful when the users just want to have a quick look at the document, rather than to extensively view and markup.

- Virtual Multi-page documents eReview has the ability to consolidate individual single-page documents from different file formats, into one virtual document. These virtual, multi-page documents are easy to display while reviewing. This helps users to construct a single compound document out of several individual documents.

- Server as well as client-side viewing: EReview provides the option for client-side as well as serverside viewing. The users can also switch between these two modes of viewing namely the client-side and the server-side at any time. Viewing of some important formats is explained in the following sections of this document.

Markup Tools:

Fig - 5

Powerful markup tools are available for each document and models to do graphical annotation while reviewing documents from server. Fig-5 depicts the standard markup tools in eReview. eReview supports a multi-layer, multi-author, multi-file markup paradigm where each meeting attendee's annotations are stored on a separate layer for easy individual reviewing and group review. Multiple markup objects including circle, arc, square, WYSIWYG text, rectangle, clouds, line, free hand, picture object, etc are available.

- Users can add multiple annotations objects on a document.
- There are different layers of annotations/markups present in the markup files, based on authors.
- Every user/author has his or her own markup layer by default.
- Authors can add multiple layers also within the same markup files.
- There can be multiple markup files associated to the base document.
- Each markup file has info about different layers of markup, their authors and the base document, to which they are associated.
- While loading the already saved markup files to the base document, eReview has built-in intelligence to only display the markup files associated with that base document.
- Markups cannot be edited by any person other than the author.

The navigation panel at the extreme left enlists the opened documents along with the markup details in a tree-like structure. One can browse through the opened documents along with the annotations through this panel. Another feature that is provided based on eReview's MDI capability is an Overview Window. This is a navigational tool that allows either zooming or panning around a drawing. The Overview Window contains a movable, scalable Shadow Box that defines the contents of what is being displayed in the main drawing window.

eReview Toolbar Buttons:

Viewing Tools:

Fig - 4

Viewing Viewing toolbar contains buttons pertaining to viewing and printing operations only. Fig-4 depicts the standard viewing tools in eReview. These buttons are customizable through a separate admin module. eReview provides the user a handful of common viewing functionalities to properly examine various unrelated, unstructured content and data. While viewing multiple documents within a single applet instance, the user is able to perform several viewing related operations including panning, zooming and rotating. For very large and complex files like Esize documents, an overview window (bird's eye view) can be used to navigate through certain parts of the document while Side-by-Side compare/tiling of documents and helps locate the changes between revisions of the same documents or drawings.

- Intelligent viewing**:** This is achieved through the state-of-the-art intelligence built into eReview. EReview keeps the intelligence of the information stored in the documents, that can be used later for any manipulation and controlling of viewing. Each document type in eReview is handled separately and the inherent characteristics of the document are exposed through a unique feature called "Drawing Controls". eReview retains the information such as layers, blocks and views for 2D CAD formats (DWG, DGN, DWF etc), layers, pins or fills for ECAD formats, bookmarks for PDF formats, line width/colors for HPGL, brightness, contrast, aliasing etc for scanned images and so on, and the ability to manipulate the views using this intelligent information.

- Auto-detection of File Formats in eReview: eReview has the ability to automatically detect the file type i.e. even if the file name suggests some other formats, eReview can detect the correct format.

browser can run the application on the desktop. The primary advantage of this technology is the immediate availability of full functionality of the desktop product (fat client) from the browser. Because the user is already trained on the desktop version, no additional training is required.

The other principle technology that is being used to provide view and markup functionality is based on Java. Many companies are rewriting their Microsoft Windows based view and markup applications as Java Applets. Although these applets provide the view and markup functionality, they are not collaborative. Yet in today's evolving marketplace, collaboration has become essential.

Why Real-Time Collaborative View and Markup?

So what is really required in today's market? First, let us understand why view and markup products exist and why the view and markup process is essentially a collaborative process even though these products have traditionally been stand-alone desktop-based products. In the recent past, engineers worked in centralized design teams where individuals working on the same project sat in adjacent cubicles, or perhaps down the hall. Likewise, manufacturing, marketing, purchasing, etc. were typically close by. Designers and other team members could easily meet with one another to compare notes, share information, iron out problems and coordinate activities. However, in today's globally distributed product development environment, a company's various divisions and groups are often located around the world. To complicate matters further, critical aspects of product development such as analysis and manufacturing are now typically separated from the design group and are increasingly outsourced. It is not unusual for a company and its partners to be many time zones apart.

The benefits of the traditional style of collaboration that once occurred between engineers in hallways or in offices are sorely missed as the demands of time-to-market and the increasing pressure to cut development costs are complicated by greater fragmentation of the product development process. And while e-mail, fax, and voicemail are valuable components of the newer office environment; all make poor substitutes for simultaneous real-time collaboration.

Today's view and markup solutions claim to be collaborative but what they really provide is only a sequential view and markup process. Typically, electronic documents are routed by means of a workflow process to reviewers who view them at the desktop, add their comments, and send the comments back to the designer. This is repeated in an iterative cycle until all changes have been processed, agreed upon, and the next revision of the document is released. This method may take quite some time and

the process really involves very little personal collaboration. Many companies do not know how to effectively implement even this simple view and markup process.

Yet as designs become more complex and innovative products become more important in overcrowded markets, the added value of true collaboration has become critical. When teams can easily share ideas and information and work together in collaborative sessions, the right people make better decisions in a fraction of the time and information about these decisions is immediately available. Therefore, a true real-time collaborative Web-based view and markup solution provides a competitive advantage to its users. Decisions made in an interactive, real-time environment using a combination of standalone and collaborative processes will result in better and faster knowledge dissemination and decision-making.

Why eReview?

All All global corporations will migrate to Web-based collaborative "Engineering Review Meeting" processes that encompass not only their entire organization but also the members of their demand and supply chains. For large engineering and manufacturing industries, Web-based meetings need to include the ability to view scanned and other raster images, vector formats, postscript and PDF, printer outputs, office documents (WORD, EXCEL, ACCESS etc), CAD 2D and 3D drawings and eventually, 3D models. The ability to redline and annotate all kinds of documents is a must. Redacting or hiding confidential data from selective participants of a meeting - for example, a supplier or a vendor - may be required.

Integration with other CAD, EDM/PDM, ERP/MRP and other engineering analysis/design software and backend databases over the Web is equally important. Web-based view & markup products should operate in 3 modes: 1) standalone – when only view & markup is required by a single user; 2) collaborative – when team-based view & markup is required; 3) roaming – a combination of standalone and collaborative – used in a team environment where team members can view & markup documents privately and then share their comments and markups in a collaborative fashion.

eReview has been developed to meet these requirements. It provides the foundation technology for engineering Iinternet, intranet or extranet portals and collaborative communication. eReview is targeted towards the collaborative product commerce (CPC) and engineering and manufacturing B2B market.

How it works

Since eReview is based on Java and is a client/server-based solution, it works in Netscape Navigator and Internet Explorer, as well as Windows and Unix systems. eReview provides impressive performance in a thin applet, offering more features than most JAVA based products. and because it is truly Web-

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desktops and, based on privileges, each user can either view or markup the document in a team collaborative manner. If opened in roaming mode, the document is local to the user who opened it. The user can view and markup the document and when ready to share the information with all attendees, he/she can request that the chairperson put that document into collaborative mode. Once in collaborative mode, the document appears on all of the attendee's screens, allowing the user to share his comments/markups with the team.

eReview MDI Interface

eReview is the first Java applet product that supports a true Multiple Document Interface. This allows the user to simultaneously open as many documents as required for the review session. Normal review sessions are based on reviewing multiple documents including drawings, Word docs, and other miscellaneous types of files. With an MDI interface, the reviewers (team members) can view a complete set of project documents. The following example (Fig-3) demonstrates multiple documents being opened in eReview.
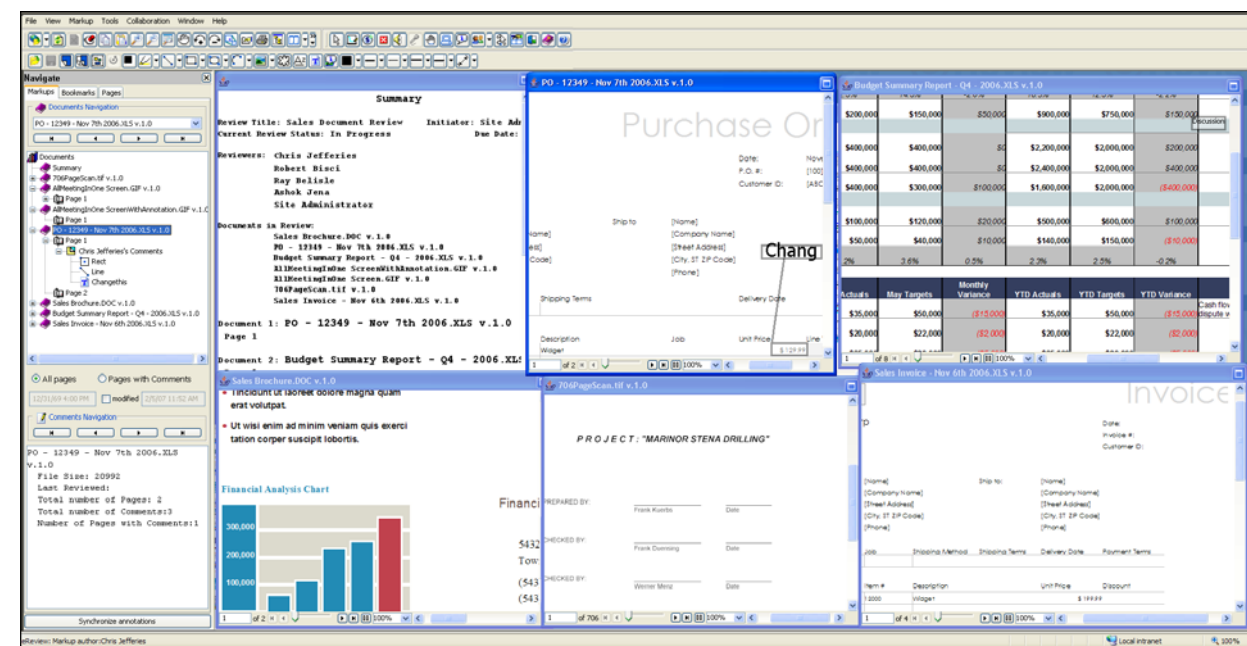

Fig - 3

As seen in the above example we can open a number of files of different formats, within the same instance of the viewer. According to requirements files can be opened in roaming or collaborative mode.

Inviting others to join a meeting after the meeting has begun:

- Click on Invite
- An email form will appear. Enter your email address and the email address of the person to attend, then click on Send.
- An email containing a direct URL link to the meeting is sent to the invitee. The person clicks on the URL Link and is entered into the meeting.

Assigning Privileges to Attendees in a meeting:

- The chairperson can enable privileges for attendees by clicking in the appropriate box for each attendee.
- Enable/disable attendees privileges including Control, View and Modify Annotation rights by clicking on appropriate box.

Using Chat:

- Chat Chat with attendees of the meeting by entering text into the Type Message box and then clicking on Send. The message is broadcast to all attendees and appears in the Chat window.
- To selectively chat with certain attendees, a feature known as "Whispering" is available. To enable whispering, highlight the attendee(s) to whom you would like to whisper by just clicking on their names. So long as attendee names are highlighted, any further messages you type will be received only by those selected attendees. To go back to the normal mode; i.e., include all attendees, control click on the highlighted attendee names to un-highlighted.

Attendee Action/Status:

- At the bottom of the Viewer section is an Attendee Action/Status bar. In this area, status about each attendee is displayed and updated as each attendee performs actions. It will indicate who is typing, creating a markup, modifying a markup, etc.
- The next line provides the status of attendees, indicating who is coming on-line, inactive, experiencing network problems, busy, etc.
- A separate Action log containing the above information is created and archived.

The eReview Document Vault

Each user of eReview has an assigned amount of file cabinet space on the eReview server – the configuration is set by the organization. Members control their own vault area and can upload documents to their vault for storage or for their meetings. Everybody in attendance can view files from the Chairperson's meeting vault. Note that eReview can also be tightly integrated with all popular document management vaults (systems). It is important to note that users can open documents in 'roaming' or 'collaborative' (default) mode. If opened in collaborative mode, the document will appear on all attendees'

based, there is no fat-client for the user to download. eReview operates in an Internet, intranet, or extranet environment, without compromising firewall security. It is truly firewall friendly. ForReview users will recognize the powerful, yet intuitive viewing and annotation tools from ForReview, a leading desktop view and markup solution. Annotations (markups) can be shared between the desktop (ForReview) and server-based (eReview) solutions.

eReview is the first Java based viewer to provide a true Multiple Document Interface (MDI). Users can open multiple documents or drawings in separate windows, then work with each window individually. Users can also execute such advanced features as *sideby- side compare* of documents or initiate an *Overview* or *Bird's Eye Window* for zooming and/or panning.

A Java Application Programming Interface (API) is provided to facilitate integrations with legacy document management systems, knowledge management, ERP, ASP, Portals, supply chain and project management Web-centric solutions. Several out-of-thebox integrations to popular document management systems like WebWorksTM, e- Matrix,TM and DocumentumTM are currently available.

Moreover, as the product evolves and new versions are released, the server is updated, providing the client with the latest innovations. No changes are ever required on the client side, reducing to zero the administration headache of distributing and supporting desktop software solutions.

Who is it for?

eReview is ideally suited for medium to large engineering/manufacturing companies that are implementing Web-based document management, EDM/PDM, ERP, Workflow, etc. and require a collaborative environment. It is extremely useful for helping an organization to extend its reach to on-line real time collaboration in its Design and Supply Chain. Suppliers and contractors do not need the application that created the document. The only requirement is a Web browser. In many cases, a company may find that using a combination of complementary desktop and Web-based view and markup products, such as ForReview and eReview, provides an optimal solution.

Document Management providers should look at eReview as a means of extending the power of their systems to include collaborative document and drawing review and markup as well as providing a powerful but simple solution that allows their users to hold on-line meetings. eReview will extend the capabilities of any *institution or university* by providing the means to a collaborative environment for its students and researchers around the globe.

Architectural Overview

eReview as a view and collaborative application uses applets at the client's browser t o view documents and manage collaboration using server side servlet components placed in a web application server.eReview Java Applet can be hosted in any Operating System which has a Web Browser to access the applet as of Web Application Server. eReview is developed using Java 2 technology from Sun Microsystems. Every browser requires a JRE plug-in (Java Runtime Environment), 1.3.1 or higher version, to host eReview applet. eReview Collaboration Server is managed by servlet application services. Oracle 9i/AS is an ideal servlet-hosting platform. If eReview servlets are hosted on a non Windows OS (UNIX/LINUX), an eReview Support Server is required to render 2D and 3D documents/models. Support server is communicated by eReview Collaboration Server using Java RMI protocol. Viewing process in eReview is organized within a distributed **eReview View Engine Framework (EVEF)**. EVEF serves as a framework for the set of eReview format libraries (EFL), enabling support of the different document types or file formats. For a detailed list of eReview supported formats, contact Web4's product team.

eReview Feature Summary

Multiple users in a single collaborative document-sharing session

eReview enables users to conduct document-centric review sessions where physically dispersed attendees literally co-view and co-markup the same set of document. Significantly,this is no desktop-sharing ,but document-sharing between the attendees. To hold a meeting and share and markup documents in real time, the Chairperson initiates a meeting and invites others to join. Starting and JoiningeReview meetings are very easy to initiate through a HTTP request. eReview server receives Attendee_ID, Meeting_Title, Meeting_ID(Optional) and mode of meeting as parameters in HTTP request header. Server side meeting organizer starts a meeting and sends back an applet instance to the client browser.
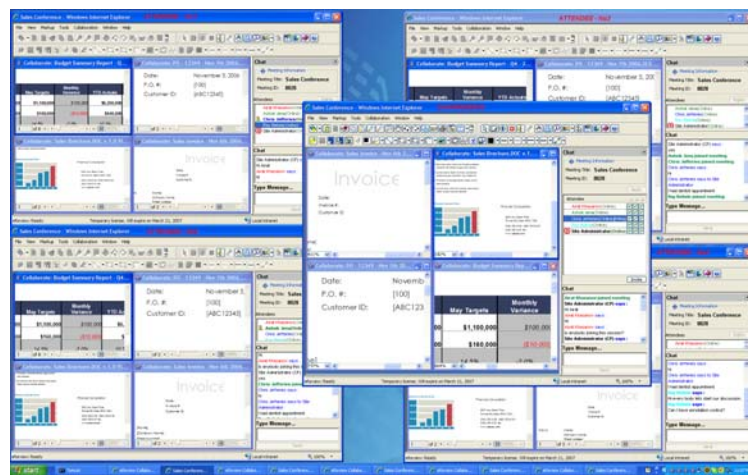

Fig - 1

eReview meeting instance as seen in attendees' and chairperson's browser is illustrated in Fig – 1.

Start new meeting:
- Open the default eReview meeting interface from a given URL.
- The person starting a meeting is called the Chairperson (CP).
- Attendee Information: Enter information in the Attendee ID and Name fields. Attendee ID can be any alpha/numeric string to identify yourself.
- Enter a title for the meeting in the Title of meeting field. Provide information in the Agenda of Meeting field (optional).
- Click on Start Meeting.

Join current meeting:
- Join a current meeting by providing the meeting ID or by searching for the meeting by Title and/or Chairperson fields.
- Enter the meeting-ID. To be able to join a current meeting, the person inviting you must provide you with a meeting ID.
- Click on Join Meeting.

Search for meetings to join:
- Enter search criteria in the Title and/or Chairperson fields.
- Click on Search Meetings.
- If only one meeting matches the search criteria, you will be directly connected to that meeting.
- Wait until the eReview viewer interface appears on screen.

The eReview Meeting

The eReview Meeting Screen displays five sections: (1) the Toolbar section, (2) the Viewer section where multiple drawings can be viewed and marked up, (3) the Control section where the Chairperson controls the meeting, invites others to attend, assigns privileges to others, and has access to the eReview Document Vault, (4) the Chat section, used for textual communication with other attendees.
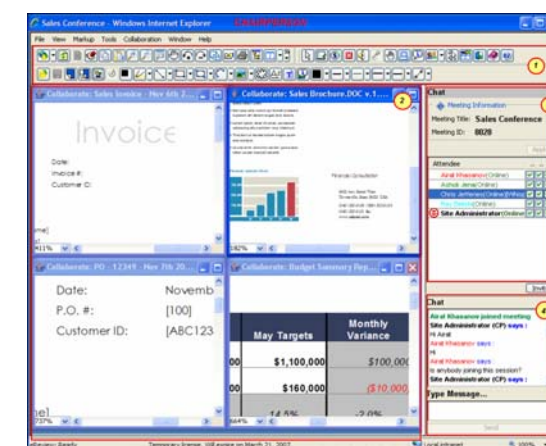

Fig - 2