

Unlocking the Expertise of the Extended Enterprise: Cimmetry Systems' AutoVue Real-Time Collaboration

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Summary and Opinion

Real-time collaboration means being there and being involved. In discrete manufacturing the use of product visualization and collaboration tools allows key individuals throughout a company's extended enterprise to share and influence a product's initial definition and its evolution over the product's entire lifecycle. Without real-time collaboration tools, however, the give and take of their input for improved product ideas often takes place too late or not at all.

Executives in both small and large companies know that by garnering the collective expertise found across their extended enterprise and by focusing their efforts to plan, design, create, and deliver added value provides them a competitive edge. The path to successful product development must unlock the wealth of information buried in the knowledge and expertise of not only design engineering, but also across the full range of internal and external developers, suppliers, manufacturers, and deliverers – even extending to the customers themselves. Real-time collaboration that allows interactive two-way communication of ideas and issues is critical for their contributions to be fully heard and understood.

Cimmetry Systems' AutoVue offers the power to harness the contributions of all involved in a product's lifecycle process across definition, production, delivery, and service.¹ AutoVue is a visualization and collaboration solution for the A/E/C, Engineering, Manufacturing and Electronics markets that enables enterprise-wide viewing, measuring, and markup of product data. It supports the extensive range of native format databases that constitute a complete product definition, including 3D CAD parts and assemblies, 2D CAD drawings, EDA PCB layouts and schematics, scanned and raster documents, vector files, office documents, and graphics.



AutoVue's thin-client real-time collaboration provides organizations the communication medium and the interaction tools necessary to bring product contributors together to share their ideas on the full product data model. AutoVue's real-time solution delivers the requisite independent data viewing, query, and markup capabilities to each user's desktop allowing them to be equal contributing participants in a collaborative session, not just passive observers. That same software architecture yields superior performance when compared to general-purpose desktop sharing applications. AutoVue allows each contributor to take advantage of his or her compute power to limit the necessary data transmitted between real-time participants – an especially critical factor when manipulating sophisticated 2D and 3D product models.

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In addition, AutoVue records a complete audit trail of changes made during the product development process with each participant's contribution clearly identified. The industry's adoption of Product Lifecycle Management (PLM) heightens the need to record and track which product changes were made, why they were made, and who made them, in order to ensure reliability and accountability.²

D.H. Brown Associates, Inc. (DHBA) recognizes all the necessary attributes – independent user controls, performance, and detailed contribution tracking – in AutoVue real-time collaboration support to enable product development companies to proactively unlock the wealth of knowledge and expertise in their extended enterprise. Companies with product viewing and collaboration needs should investigate the Cimmetry Systems' suite of products for data sharing and communication throughout their product's lifecycle.

AutoVue's Virtual Meeting Room

AutoVue real-time collaboration users can schedule and host collaborative sessions working across the Internet or the company's internal intranet by inviting key participants at any time. Such interactive sessions draw together product developers, marketing, suppliers, and service organizations to facilitate improved product marketing, creation, manufacturing, delivery, and support. Individuals join into the work session as equal participants interacting with and contributing to product definition and issue resolution.

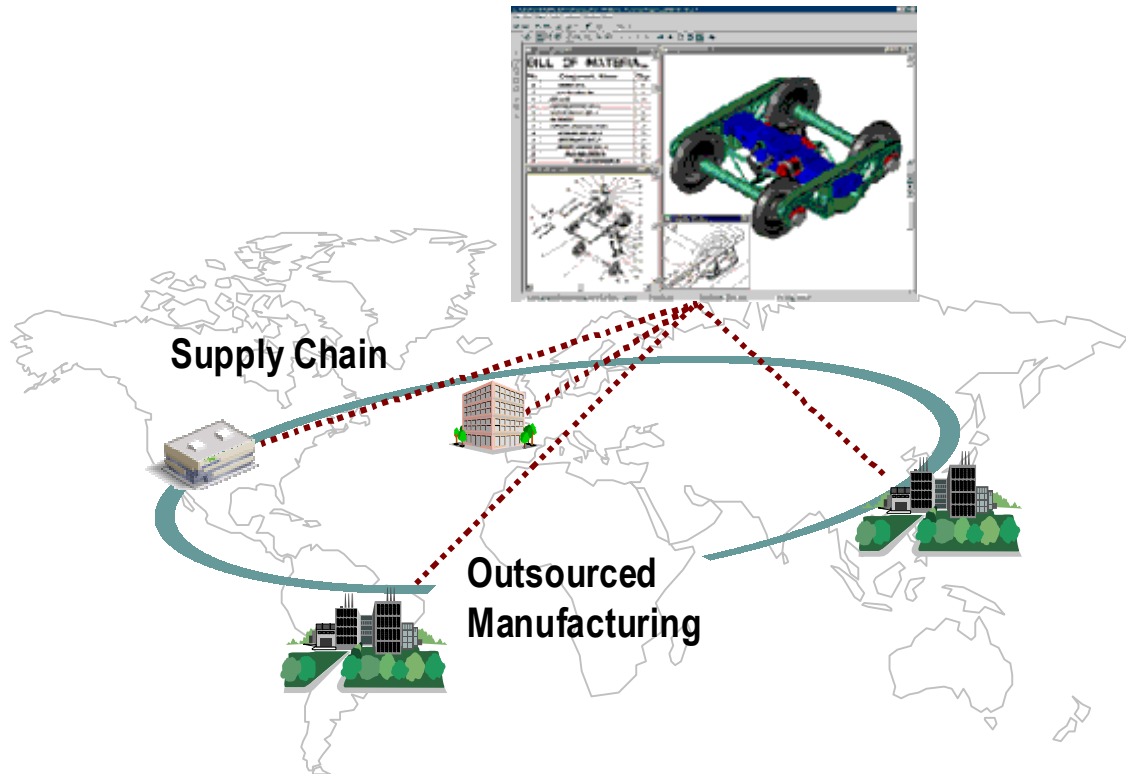
Such flexibility makes it possible to leverage collaboration both within and outside of the company's design engineering walls. For example, a company's sales professional in the field can directly involve his or her customer over a web-enabled view of an in-process product design in real time to give product feature guidance to company engineers and to assure customer satisfaction. Often such interaction results in the company packaging the most appropriate product options together to match customer expectations with buying interest.

Real-time collaboration improves communication within design development organizations themselves. For example, product manufacturability is improved when a supply-chain manufacturing engineer can enter into a two-way discussion with the company's design management to offer alternative improvements to expedite manufacturing of the product, saving cost and product delays. Access to and involvement with full product data across a web-enabled, interactive visualization framework that supports both two-way and real-time collaboration opens those paths.

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Figure 1: AutoVue Real-Time Collaboration Session across the Supply Chain



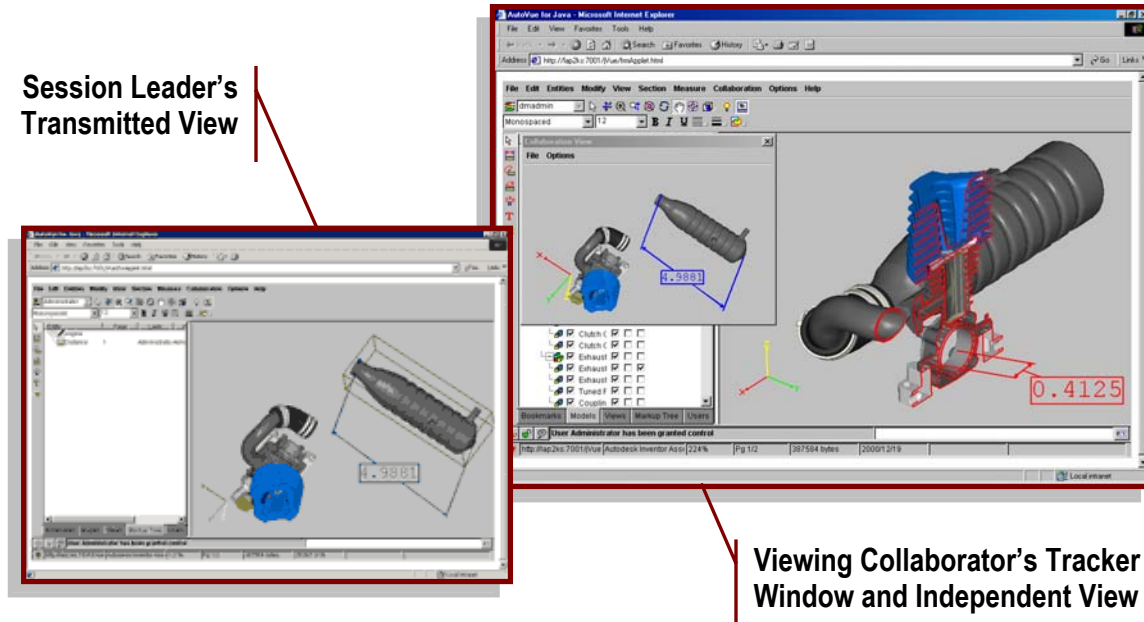
AutoVue's real-time collaboration is tuned for the engineering world and goes far beyond the capabilities, performance, and audit trail accountability of general-purpose desktop sharing solutions available in the commercial market.

- AutoVue is a collaborative visualization framework that allows simultaneous viewing of product data. Session participants can unlock from the common view and interact as equals with their own independent controls to manipulate viewing of the product models. They also measure, annotate, and markup without the need to pass session control between users. AutoVue real-time collaboration users can then transmit a view of their ideas and concerns to fellow participants. In addition, participants may simultaneously follow the session leader through a "Tracker Window." Such flexibility differs from general-purpose desktop sharing solutions that restrict interaction with the viewed data in a broadcast mode. They limit viewing and manipulation of the product model solely to the session host. All other participants must passively follow, patiently waiting for the "control baton" to be passed.

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Figure 2: AutoVue Independent Viewing Controls



- Cimmetry is also in tune with the industry's move toward full PLM and the need to record a complete audit trail of changes during a product's development process. PLM precepts require that companies diligently track what changes were made, why they were made, and who made them. AutoVue real-time collaboration keeps a complete session transcript with each participant's contribution clearly identified. In the desktop application sharing world all such recorded actions are unstructured and non-attributable.
- Superior performance is achieved from the underlying architecture of the AutoVue solution, which runs the program software on all PCs of the participating collaborators. Real-time interaction between participants takes dramatic advantage of the resources available at each user location to limit the transmission of data across the web-enabled link. Only directive commands need be transmitted to perform complex 2D and 3D viewing and scaling. General-purpose desktop sharing solutions are limited to the application running only on the host machine and are forced to transmit voluminous update data to the viewing participants. Their response delay for a simple 3D rotation of a typically complex product model can disrupt the flow of the collaboration.

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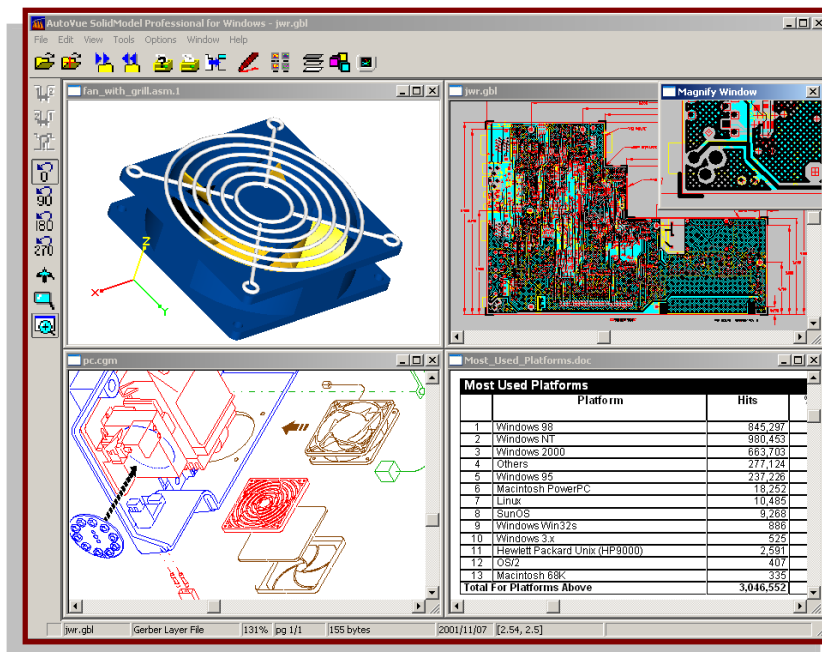
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Product Complexity and Collaboration across the Enterprise

A successful product is the collective effort of hundreds if not thousands of contributing individuals. The endeavor must draw input from and consideration of customer requirements, business planners, design engineering, manufacturing, procurement, marketing, sales, distribution, and support organizations. The path to true collaborative data sharing must also draw in participants from beyond company walls by providing access across the supply chain for outsourced components, and into the distribution chain that sells and services the product.

In addition, today a full product definition includes not only 2D drawings, 3D mechanical models, and product structure, but equally important electrical design automation (EDA) components and subsystems. Cimmetry has long been in the forefront of solution providers supporting an extensive list of data formats as input to AutoVue. Recent extensions in EDA formats underscore their continued efforts to remain a leader by providing a complete solution for product developers of manufactured goods. AutoVue supports EDA formats of Cadence Allegro, Mentor Board Station, Orcad, PCAD, Gerber, EDIF, ODB++, Gencam, IDF, PDIF, and Barco.

Figure 3: AutoVue Visualization of 3D and EDA Formats



Use of the AutoVue visualization and collaboration solution within engineering organizations opens pathways for a company's product design groups to work interactively with local workgroups and geographically dispersed teams. Company executives can

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leverage both specialized expertise from other company locations or smooth interaction with suppliers on outsourced design and manufacturing work. Current users of real-time collaboration technology report numerous cost and program schedule savings by resolving issues immediately in an interactive session. One common circumstance finds a company design engineer collaborating with a supplier team to resolve a 3D spatial interference conflict with the outsourced components. Previously, similar issues took days of back-and-forth communications attempting to converge on a solution.

More importantly, real-time collaboration opens product definition to the full enterprise, leveraging product models outside of the company's design engineering walls. Adherents of real-time collaboration have followed a road map of progressively widening the sphere of influence for sharing product data outward into the enterprise. First steps often open communication between design groups and manufacturing planners. For example, a design manager will consult with the company's offshore manufacturing planning team using a web-enabled digital mockup of the product, seeking to understand and integrate tooling requirements, in order to save costly missteps downstream in the fabrication process.

As companies mature in their use of real-time collaboration tools, further steps branch out into both sales and service of the product. Cimmetry Systems has tuned the user interface of AutoVue to allow intuitive, easy deployment by non-technical users. Field service can interconnect not only with design engineering to interactively discuss a specific product failure, but more important can directly connect with sales and marketing to relate potential future improvements.

The value of real-time product collaboration spans the extended enterprise – accelerating direct communication across design workgroups, suppliers, sourcing/procurement, manufacturing, marketing, sales, and services – and offers the potential for improved products, lower cost, and more reliability in time-to-market. Cimmetry Systems has established itself as a leader of visualization and collaboration solutions in delivering that value with the AutoVue product.

¹ For additional information on Cimmetry Systems and their products, see www.cimmetry.com.

² Cimmetry has an OEM presence in the PLM and Document Management arenas with companies such as Agile and SmarTeam providing AutoVue functionality integrated within their own product offerings. Cimmetry's future OEM milestones include integrations with ERP vendors.

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