

# Visualization on an affordable scale

A “scalable desktop” with keyboard, mouse and Windows interface reduces or eliminates the learning curve while maximizing ease of use.

## AUTHOR

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Powerful new visualization technology is helping oil and gas companies dramatically improve exploration and production costs. Visualization is providing new ways to look at — and think about — data, allowing engineering and operations teams to explore multiple “what if” scenarios, supporting more rapid analysis and leading to improved decision-making.

The combination of large screens and powerful projection technology — driven by a familiar Windows interface — enables the display of seismic data, complex reservoir models, well logs and geologic cross-sections for real-time visualization, analysis and more effective decision-making.

In recent years the breadth and depth of information available was isolated in silos. Engineers could wield complex computer modeling systems on high-end workstations, geographically dispersed teams could hold virtual meetings and share data from their desktops, and executives could employ spreadsheets and PowerPoint presentations to aid in decision-making. Today, cross-functional teams need to access all of these disparate data sources simultaneously. They need not only the “big picture” but the whole picture to see, examine and analyze far more information than ever before.

The advance of technology has blurred the distinctions between personal computers and video. Much more powerful computer processors and high-speed data pipelines such as DSL now make it relatively easy to view graphics, output from software applications and the Internet (including some

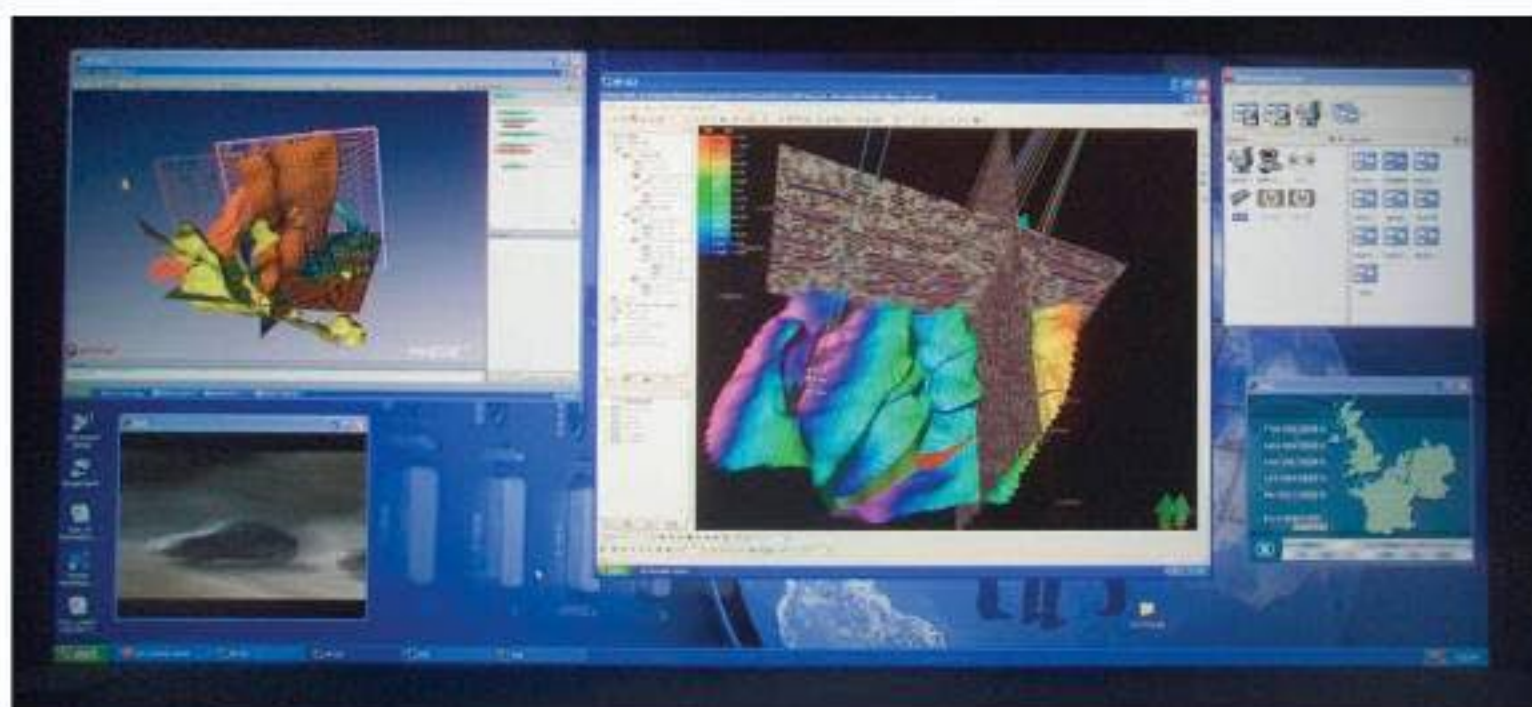


Figure 1. Scalable desktop systems such as Barco's VR Workroom and XDS 1000 hybrid display support multiple windows — everything from virtual reality to spreadsheets to teleconferences — all driven by the familiar Windows interface, standard keyboard and mouse. Using the system is just like operating a PC but on a massive scale. (Images courtesy of Barco)

video), all on a PC desktop. However, the ability to interact with all of that data in real time by more than a handful of people has remained a challenge. Projecting the PC desktop on a large screen in a conference room won't do. Details are fuzzy, video clips are severely limited in size and duration, and no laptop could possibly handle several much less all of the inputs required. Until recently, the best available solution has involved using a room full of projectors, switching and control systems to manage the inputs (PC, Internet, video, satellite teleconference, etc.)

## Bigger, better, brighter — and easier

Quantum leaps in visualization software, processing power and performance, resolution, image quality, and projector technology are making it easy to view and interact with multiple inputs of data in ways that were unthinkable until just recently. Increased resolution has been driven by high-performance graphics cards and cluster technology that harness the power of multiple computing resources to power the graphics. Higher resolution projectors provide HDTV-level performance. Displays

now use more and smaller pixels per inch, and the cost of lumens has dropped dramatically over the last decade, which translates into brighter picture quality.

Instead of looking at reams of data and static maps, today's teams can use immersive visualization systems, including virtual reality (VR) technology with scalable desktop functionality, to literally “get inside” the data, grab and move partitions, get better views from different angles, and even call up additional information in multiple windows. Planning and decision-making can now be shortened by a matter of weeks, ensuring that decisions are made based on highly accurate data models.

Modern systems greatly enhance 3-D visualization, aiding in the recognition of patterns and trends. For example, an analyst can examine a cubic partition of a data set, select appropriate axes, and then discover trends when the cube is sectioned or viewed from a specific angle. The system can be used to show physical surfaces such as fault planes, layers of constant porosity, or a mix of geographic coordinates and two-way seismic transit time. Abstract parameters such as sonic interval tran-

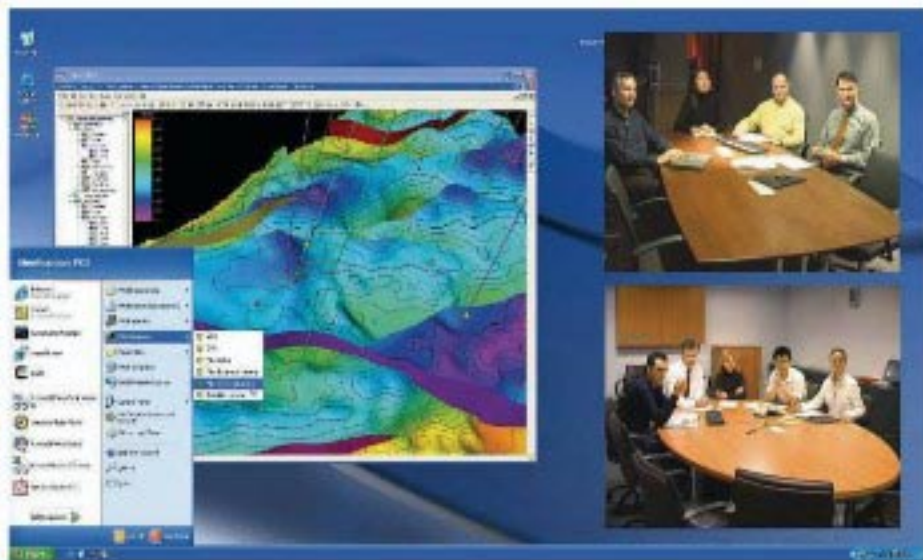


Figure 2. Scalable desktop display systems can be easily integrated in the user's existing network infrastructure, allowing information sharing between remote sites. This enables workgroups and international teams to be more productive by allowing them to work collaboratively. This picture illustrates Barco's collaboration center in Kuurne, Belgium. The system uses a large-scale Barco CadWall system powered by two Barco Galaxy active stereo projectors with active stereo and active Infitex stereo and the Barco XDS-1000.

sit time, density and porosity may reveal trends in reservoir lithography.

Today's visualization systems are also easier to use than ever before. For example, while Barco's "scalable desktop" display solutions are capable of supporting a large array of inputs, including multiple high-resolution mono and stereo windows, the entire system is driven by an intuitive Windows XP interface. Using a familiar PC keyboard and mouse, team members can drive the visualization system with little or no training, dragging and dropping, re-sizing, zooming, and freezing windows, just like a desktop — except on a much larger scale. The "scalable" concept means that the scalable desktop is scalable for all display resolutions and display sizes.

The scalable desktop display systems are powered by embedded PCs or servers that are integrated into the corporate computing environment and connected to the network. Users can freely position and scale information clearly and concisely. By combining desktop layers, video and RGB insertion modules, and high-resolution stereo modules, the system can be

tuned to enhance the display wall performance.

These networked projectors make it easy to access data located anywhere on the network and display it on the screen. For example, users can simply connect their laptop to the network using Barco's VNC enabled Proximity Desktop Client to quickly and easily project their desktop onto the display.

#### Enabling cross-functional teams

Modern visualization technology provides a close-up perspective for the geologist, geophysicist, hydrologist, petrophysicist, pipeline engineer, drilling engineer, project manager and others to interact with one another via the data resources. Every issue and alternative can be explored in real time; each team member can contribute analysis from his or her particular disciplines as a result of being immersed in a virtual world of data. These experts need not be in the same room, time zone or even hemisphere while they are interacting with each other and the data. Using networked visualization centers with scalable desktop capabilities, onshore scien-

tists, engineers and management can even see what operators on oil platforms see, thanks to real-time data feeds via fiber-optic cable, broadband radio-linked communication and sub-surface sensor transmissions.

Team members located throughout the world can work closely together, sharing a common real-time virtual representation of all information. Onshore, senior management, investors and other non-technical individuals can be shown vivid 3-D images of oil and gas prospects in the boardroom.

Soon, oil and gas companies will be steering drills anywhere in the world with pinpoint accuracy from their headquarters in Stavanger, Houston or Dharhan. By incorporating data collected directly from drill bits thousands of feet beneath the earth's surface into real-time stratigraphic views, engineers will be able to help drillers turn in the right direction.

Oil and gas companies can tailor their visualization solution to their unique needs, specifying the screen size, depth of the system, number and type of projectors, and more. These systems can operate in both mono and stereoscopic modes as a standard and include and integrated videoconferencing systems.

Properly implemented, a large-scale visualization capability can dramatically reduce project costs and field errors. With rig downtime costing from US \$500,000 to \$1.2 million per day, modern visualization systems will enable oil and gas companies to make better decisions to reduce or eliminate such costs. Return on investment is typically less than 1 year.

The high costs of exploration and the risks associated with it have made it imperative for oil and gas companies to find safer and more cost-efficient methods to locate and capitalize on new fuel resources. Visualization technology such as the scalable desktop is helping progressive companies significantly reduce exploration time and risk, saving millions of dollars.

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