

# White paper

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## Better collaboration as a cost-saver for the oil & gas industry



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## 1. Introduction: what is collaboration?

Collaboration is the “act of working together”. It is an everyday element of normal social and professional life, and is as old as mankind itself. It was essential to the development of civilization, as societies grew more complex and their progress increasingly depended on people with different specialties working together. For example, while a successful mammoth hunt required a group where each member could more or less perform the same tasks, a medieval cathedral was the result of painters, masons, sculptors, glaziers and carpenters who needed to know what the other was or would be doing to make their job a success.

In today's global economic environment, multinational companies require efficient collaboration in much the same way. A make-or-buy decision in the US headquarters of a company may hinge on a crucial process going on in China. Without the right conditions to collaborate smoothly, that company could make the wrong decision and suffer a major blow to its financial health.

A perfect example of a global, multinational industry that depends on critical information from many disparate sources and locations is the oil and gas industry. According to a February 2009 research by PennEnergy for Microsoft and Accenture, over 70% of oil and gas professionals believed collaboration is “important for driving revenue, cutting costs” and contributes to “the health and safety” of workers. Using salary statistics of the US Department of Labor, Microsoft and Accenture estimated that the industry loses out on about half a billion dollars annually due to shortcomings in collaboration technology alone.

In the publication of the survey conducted for Microsoft and Accenture, Craig Hodges, US energy and chemicals industry solutions director for Microsoft, went on record as saying that “During this time of economic upheaval, when every dollar counts and effective decision-making is crucial, new technologies [...] can help oil and gas industry professionals find information, collaborate and generally be more productive. In an environment with fewer workers and less resources, this is incremental [...] in finding new reserves, improving execution of capital projects, driving new innovations and reducing costs.”

This paper will attempt to identify the different types of collaboration the oil and gas world is currently using, and will discuss their challenges as well as possible solutions.

## 2. Collaboration – challenges and requirements

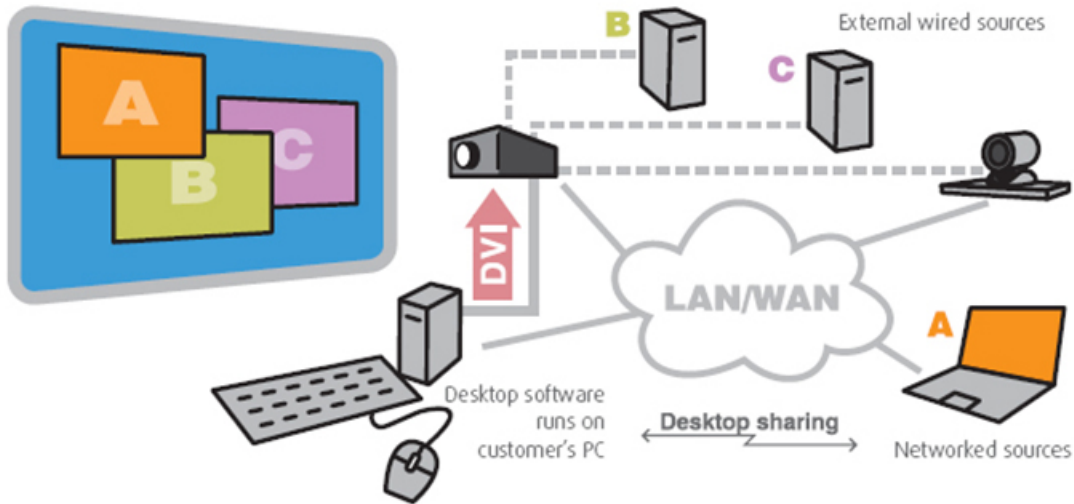
While collaboration has gained momentum as a concept and a recognized need of the oil and gas industry, it remains vague in terms of solutions. “Collaboration” as a term is very broad in itself, because it already covers traditional means of decision-making, such as face-to-face meetings with people taking notes, telephone conferences or e-mail exchanges between groups of people.

However, for globally dispersed, multi-disciplinary teams, this is often unpractical or even impossible. This is why many companies have been adopting visualization to aid in collaboration, ranging from flat panels to multi-projector, 3D display systems.

Not each collaboration environment has the same requirements or faces the same challenges. However, before we go into the specifics of each collaboration type, we can identify a number

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of requirements that visualization should ideally meet before being considered as a valid solution to the oil and gas industry's challenges in this field.



*Typical network setup according to the new collaboration model*

## 2.1. Challenges for collaboration based on visualization technology

Any solution for collaboration that involves visualization technology is inevitably going to involve IP technology at some point, and this is becoming more and more true as time progresses. These solutions often comprise products from several different companies, and represent a higher risk of failure by adding more devices to the network, because they are tasked with doing things they were not designed for (even though they are often marketed that way).

While logical, the convergence between the worlds of AV and IT, which are historically separate disciplines or applications, is beset two major challenges:

- Most projection systems have not primarily been designed with IT or IP integration in mind, because they have been developed by the AV world, which has followed other evolutionary paths. As such, the full potential of IP integration remains largely unexplored, or is fulfilled in impractical ways.
- Lack of attention for the end user – a general problem that has plagued the AV industry for quite some time. This results in proprietary machine interfaces and connectivity problems that cannot be solved quickly by those who are supposed to operate the system (i.e., decision makers, business executives, meeting participants).

## 2.2. Solutions

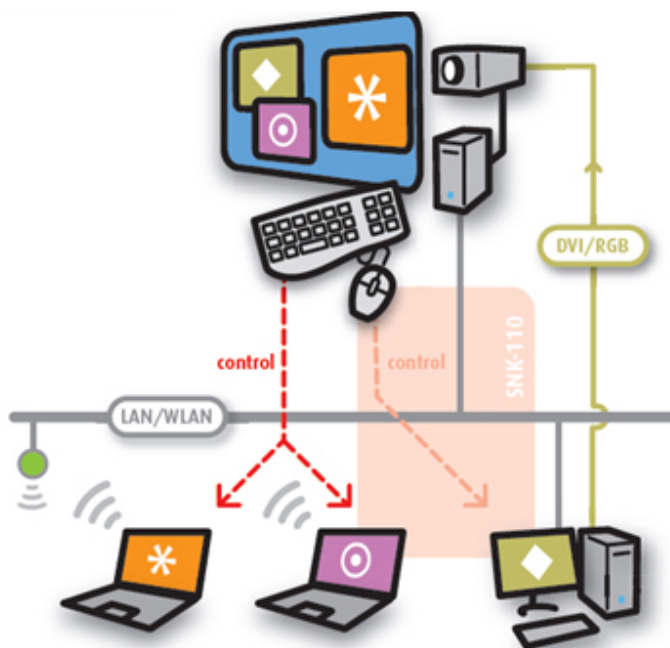
Recent years have seen an alternative to the awkward, multi-party, ill-integrated solutions gaining traction. This alternative comprises hardware (projection, screens, display management, structures) as well as software, all from the same manufacturer. This philosophy puts the projection system at the heart of the network, rather than making it an

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extra peripheral or a device accessible through the network in limited ways. This collaboration approach offers the following functionalities:

- Integration of a diverse number of hardware and software sources simultaneously (whether connected or networked), eliminating the need for constant source switching.
- A Windows desktop environment, which strongly reduces the time needed to learn how to operate the display system.
- Mouse and keyboard control of the display system. This includes resizing and moving source windows, as well as remotely accessing sources on the network (i.e. other computers, workstations and remote software applications)
- Real-time data sharing. Users on the network can send data or share their desktop with the display system, while the system can retrieve networked desktops and display them as sources.
- Videoconferencing. Thanks to an increased bandwidth in IT systems, projection systems' high resolution and multi-windowing capabilities, HD videoconferencing applications can run alongside other sources without losing detail. It is also possible to project multiple videoconferencing windows side-by-side.

It should be noted that not all types of collaboration require all these features. This is why, in the next section, we will discuss the three main types of collaboration venues. We will come back to how the features of modern, IP-integrated visualization with Windows functionalities can help each of these rooms in their own specific ways.



*Real-time content sharing over the network through the visualization system*

### 3. Collaboration – different types

#### 3.1. Collaborating within the facility

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*Videoconferencing with clear visuals in a Windows environment*

The primary venue for collaboration within an oil and gas facility – whether it's an administration unit, a production plant or a monitoring center – is a regular meeting room. Obviously, meeting rooms aren't exclusive to the oil and gas industry, and are some of the most tried-and-tested business locations for collaboration.

In regular team meetings between people who see each other on a daily basis, technology is not much more complex than some stationery, laptops and a whiteboard. However, when the room is used on a regular basis for larger team meetings or collaboration sessions between people with wildly different jobs – say, someone from the purchasing department, a petrochemical engineer and a public relations officer – things can get a little trickier. It gets even more difficult when this group wants to involve people who can't be on the meeting but are present in the facility.

Visualization is already widely adopted in meeting rooms by many oil and gas companies, as purchasing costs have gone down and the reliability of such equipment has risen. The visualization technology used in a meeting room will usually be a small projector or a flat panel. Ideally, it offers enough brightness so that the meeting participants can work in normal lighting conditions, and enough resolution so that sources can be displayed adequately. But as pointed in section 2.1., visualization has a few problems of its own if it wants to help facilitate collaboration, which is why the collaborative display technology discussed in section 2.2. can help out.

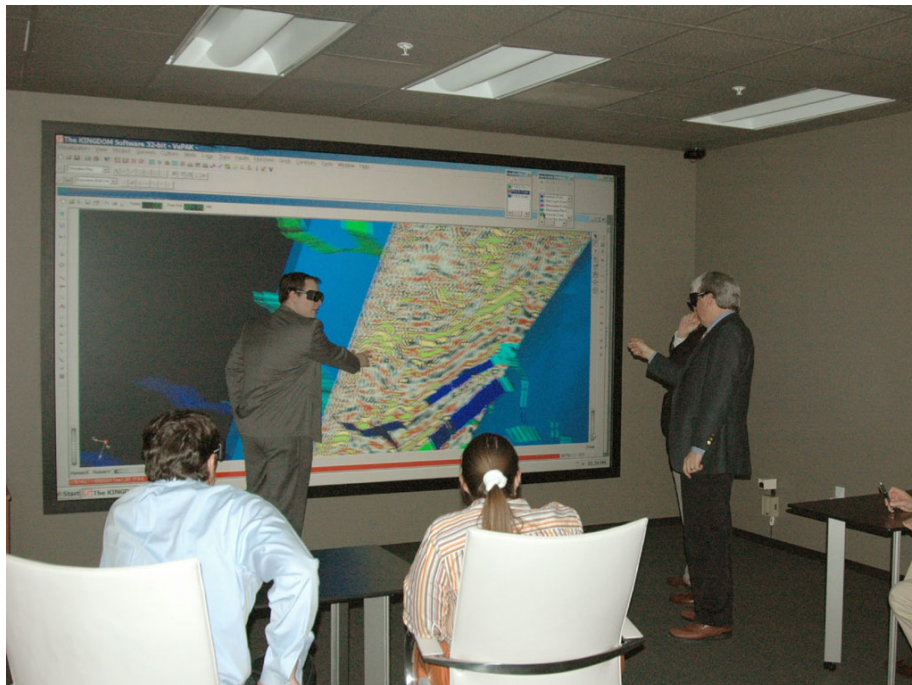
For example, the purchasing manager can now show a spreadsheet with costs and prices, while the petrochemical engineer can keep their presentation of various products running in the background, and the public relations officer can understand the link between the two sources much easier. If necessary, they can also pull sources from the network, or set up a videoconference with another colleague who is still at his desk. They can save their working

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layout and clear the room for another team meeting, and simply return, retrieve all previous settings and continue where they had left off at a later time.

## 3.2. Collaborating in a 3D environment



*3D team collaboration in RSK UK Limited's Houston facilities*

The oil and gas industry has long held a pioneering position in the usage of stereoscopic 3D. In the exploration and production segments of the oil and gas world in particular, 3D has proven to be an intuitive way of analyzing large amounts of subsurface data or reservoir models. That this task requires professional visualization goes without saying. Before even considering the collaboration aspect of geophysical data analysis, 3D display systems need to provide the level of detail required to see each aspect of the simulated model – missing out on one important detail could potentially cost an oil and gas company millions.

As far as collaboration is concerned, a key issue is that most 3D installations can't show more than one source at the same time, and that source switching is even more perilous. Unfortunately for these systems, multidisciplinary teams often require simultaneous access to a multitude of sources to make the best decisions.

A core advantage of the integrated visualization systems discussed in section 2.2. is that both hardware- and software-wise, they have been designed for source multi-windowing. This is true for regular 2D sources (e.g. MS Office applications) as well as 3D sources. Some of these systems allow up to six 3D stereo sources on-screen at the same time, and also offer any combination of 2D and 3D on the display simultaneously. Data applications running from remote workstations can be accessed from the central collaboration hub, and controlled with the visualization system's keyboard and mouse, which greatly reduces the need to connect every single source to the display physically.

### 3.3. Remote collaboration



*Inter- and intra-facility collaboration in BP's on- and offshore Aberdeen offices*

A third collaboration scenario typical for the oil and gas world is one where an onshore facility needs to work with specialists on an offshore location. When two teams need to coordinate a drilling or production process, a telephone conference cannot convey all the details needed to arrive at the right conclusion quickly. The onshore team will not have a direct view of what is happening, and the offshore engineers can only guess what sources their colleagues are looking at.

Many of the points made in section 3.1. are valid for this type of setup, too. But the emphasis here is uniquely strong on the advantages of videoconferencing. Real-time videoconferencing and data sharing through an integrated visualization system can help an oil and gas company make huge strides in its collaboration workflow between on- and offshore teams. While the onshore team can follow a live video feed of a drilling process (and get a perspective that people on the rig don't have), both teams can exchange updates of drilling data across the display system, and see all information simultaneously. This shortens the time spent explaining situations, and allows near-instantaneous responses from both sides to challenges that arise on the spot.

### 4. Case examples

The PennEnergy survey cited in section 1 indicated that about half of the polled professionals think "they could save at least an hour every day" with "newer and more effective

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collaboration tools." Important demonstrations of this point include a few cases of this newer technology making the difference in an oil and gas company's workflow:

- BP linked their Aberdeen facility in Scotland to their offshore oil rig with a network of 43 projectors, each equipped with collaboration software. "These visualization systems have helped us realize our goals to collaborate faster, more efficiently and in a way that everyone can work with their equipment," commented Colin Critchley, BP business installation and video project manager.
- Shell has deployed similar visualization technology across sites as remote as the Netherlands, Norway and Malaysia. They primarily use large-scale 3D display walls for exploration and production purposes. Mike Boyle, subsurface integration consultant, stated that Shell engineers are now "able to display and interact with information without having to bother about technology."
- RSK UK Limited uses a compact display wall powered by one active 3D stereo projector at their Houston facilities. They use the system to cross-analyze geophysical models, reservoir data and bore plans. This visualization enables them "to deliver superior solutions in less time and at a competitive value, as well as reduce risk," said Wayne Kelley, managing director at RSK.

Again, returning to the PennEnergy survey, Jill Feblowitz, practice director at Energy Insight, says that "in the oil and gas industry, collaboration is a key strategy to reduce costs, improve efficiencies and promote collaborative working relationships among oilfield asset teams located in remote locations around the globe."