Managing China’s oil & gas
Faster, better, more efficient workflow

Urban mobility
Challenges in 21st century traffic management

Disney Train
On a country-wide 3D cinema tour
Urban mobility

A growing population and an increasing urbanization prompts governments to turn to networked display technology for improved traffic management.

Disney Train

“Disney’s A Christmas Carol” tours through the United States with the latest in 3D digital cinema technology – coming soon to a railway station near you.

Five trends in medical imaging

Medical imaging is in the process of full digitalization. We look at the five most important trends that will shape the visualization future at leading healthcare institutions.
Collaboration in oil and gas

Research shows that the oil and gas industry can save half a billion USD by investing in better collaboration - and visualization can help.
Challenges of the 21st century: urban

Impacts of urbanization and population growth

The 20th and 21st centuries have seen unprecedented growth rates in the world’s population. The economical and ecological challenges this demographic explosion has created have been a constant headache for policy makers, and show no sign of abating anytime soon. An evolution concurrent with this population growth is the worldwide trend towards urbanization. According to the UN World Urbanization Prospects report from 2005, nearly 50% of the world population, or 3.2 billion people, were living in urban areas. This number is set to increase to 60% by 2030, which would mean nearly 5 billion people living in heavily urbanized regions. Naturally, this has a huge impact on mobility.

A 2008 study conducted by automotive research agency Polk predicted that by 2010, there would be a combined fleet of one billion cars and trucks in the world, compared to the current number of roughly 942 million. The fastest-growing regions will be Asia and Eastern Europe.

The expected environmental impact of growing conurbations, increasing populations and the rising number of vehicles on the road cannot be underestimated. But, it will also affect the economy in several significant ways. Already, urban congestion is an unpleasant effect of the world’s growing mobility. The Texas Transportation Institute estimates that on average, people lose between 17 and 55 hours annually due to traffic congestion. Apart from wearing down cars, causing a strain on the existing road networks, increasing the risk of accidents and having an adverse psychological effect on drivers, the time lost in traffic jams negatively impacts economic productivity.

Multi-faceted solutions

A classic remedy against traffic congestion is to build more roads or broaden existing road networks. In densely populated urban areas, as a paper from the Municipal Research and Services Center of Washington (MRSC) has indicated, the possibilities for extra road capacities are drying up and additional road construction is unsustainable in the long term. In addition, this option has become unpalatable to a growing segment of environmentally-conscious citizens. Public transport that doesn’t use the existing road network (i.e. trains and metros) is another alternative, but if existing car traffic is to be siphoned away from the roads, this would also mean a major investment in expanding public transport networks. In turn, this would be faced with problems similar to the ones that would arise with the expansion of road networks. Even so, it’s unrealistic to assume that even if more people adopt public transport, traffic jams will somehow cease to exist in the light of the ever-growing population and amount of vehicles. A third option that will at least help alleviate the financial burdens that come with managing a large-scale road network, is electronic road pricing. One advantage is that the gains from this allow governments to invest, for instance, in improved safety measures and better equipped operator rooms.
Not as directly visible to the general public, but perhaps the most important innovation in solving mobility challenges, is smart traffic management, also called Intelligent Transportation Systems (ITS). Traffic management has been around for a long time as a passive factor in the form of road signs, traffic lights and street markings. Modern traffic management attempts to adopt a proactive model, by using real-time, constantly updated data to prevent congestions, accidents and offer information to drivers. This includes not just the obvious traffic signal data, but also data from car parks, air monitoring stations and weather stations. A key concept for the UTMC is interoperability. Data from many types of sources, some of which are sensor-only and analog, need to be correlated in real time with digital data such as camera feeds. Only by understanding the full scope of an urban area’s traffic network, operators can actually implement measures to improve the flow of traffic. Barco technology already helps a number of traffic management centers achieve the goals set forth by the UTMC program, with examples found in the busy Sheffield and Manchester areas.

Apart from on-the-fly interventions in case of sudden traffic congestions or accidents, traffic management centers can also be a central hub of information for drivers. They can use sensor data to monitor how long it takes for a car on any given route to get from one sensor to the next, and give reasonable estimates to other drivers on how long similar trips will take them. A traffic center can also use this information to make accurate recommendations on the optimum speed of traffic, or redirect it through more efficient routes, so that congestions can be reduced to a minimum. Such systems are known as “Traffic Estimation and Prediction Systems” (TrEPS), and are already being used and introduced in countries such as the United States, China and Singapore.
Vast amounts of data, one decision-making center

Making informed decisions in traffic management, which is essentially a job that requires real-time responses as well as short-term planning, depends on two things. One of them is having the right information. The digital revolution of the ’90s has helped in acquiring traffic data much faster and more directly, and as bandwidth capabilities and equipment accuracy is still increasing, it’s clear that this is not the main challenge that traffic control centers face today. Rather, the challenge is to make sense of all this data at a glance. As pointed out before, some data is purely numerical and text-based, whereas other data is visual or may even be auditory. This challenge becomes even greater in the case of a multi-agency approach, where information is shared across jurisdictions and organizations in order to realize improvements in overall safety and operations. A logical answer to these challenges can be found in large-screen visualization.

The issue here is that traditionally, visualization systems have been built using industry-specific, often proprietary systems, requiring specialist skills and expertise to use and service. Modern innovations are overcoming these hurdles through a parallel evolution towards better integration with common IT and network platforms on the one hand, and an increasing user comfort on the other hand.

With a networked visualization system, operators can monitor their display content in real-time from anywhere in the facility, or even across multiple facilities. This is extremely advantageous for collaborative work between different types of law enforcement or security services. A fire that impacts traffic can be fought much quicker if police, traffic management and fire departments have instant access to the same sources and can coordinate their efforts efficiently.

Traffic managers interact with visualization equipment through software. A popular law in design stipulates that when design fights human nature, it will lose. As such, software that wants to tie together all relevant information for traffic centers needs to be intuitive and easy to use. In combination with large-screen video wall displays, modern control room management software improves overall situational awareness as it allows operators to preview multiple sources and combine these sources into new perspectives, which enables them to make the right decisions faster and more efficiently. Control room management software can also promote operator interaction and collaboration between different control rooms (decision rooms, crisis rooms, etc.) by allowing operators to share data across the network, which can include other display systems, personal computers and laptops.

In short, visualization for traffic management centers have become solutions that comprise intelligent displays, high-performance encoders/decoders and display management and control software. This enhances the flexibility, scalability and reach needed in today’s traffic control centers.

Prepared for the 21st century

Today’s road users are generally unaware of traffic management centers’ actions until they are faced with mobility problems. By making extensive use of today’s technology breakthroughs in terms of IT infrastructure, visualization technology and collaborative software, traffic control centers can adequately face the challenge of improving mobility in an increasingly urbanized world. Ideally, this would make traffic management centers even more invisible than they already are – the busy ghost in the machine ensuring that drivers get to their destinations safely and timely.

www.barco.com/traffic
Collaborating efficiently in oil and gas industry

The China National Petroleum Corporation (CNPC) and the China National Offshore Oil Corporation (CNOOC) are the largest Chinese companies tasked with researching, extracting and managing the country’s energy resources. Both companies turned to Barco for professional visualization to help solve collaboration and safety challenges that inevitably arise with operations of this complexity.

CNPC needed display technology to visualize real-time data and video inputs from many oil and gas production or transport sources at the same time. With an 18x3 cube configuration and dedicated Barco display management technology, “we can divide the large display wall into three parts,” explains Mr. Qi Guocheng, CNPC Automation Manager, “one for oil production monitoring, one part that displays crude oil data, and a third part for natural gas transport control. Because all information is instantly available, our operators can interact immediately with all production and transport data, all the time.”

CNOOC, on the other hand, needed to simultaneously meet the need for presentation and versatile analysis of geophysical data. It chose to standardize on Barco systems for three separate installations in Beijing and Zhanjiang. The display walls all share the same familiar Windows environment. “From engineers to managers, at whatever site they are, they can control the display system with mouse and keyboard, displaying several sources simultaneously in any mix of 2D and 3D. This is a huge advantage when we want to compare various data sets, or keep both video and data available at the same time,” says Mr. Xiong Zhiqiang, Security Supervisor of CNOOC, “Through their technology, Barco has offered us the right environment for analysis, collaboration and presentation.”
U2 is one of the world’s most famous rock bands, with a career that spans four decades and 22 Grammy Awards. While the band has never forgotten its traditional rock roots, it has always sought to incorporate modern technologies in its live tours. In 2009, for the third time this millennium, U2 has made Barco visualization a core part of its live show.
The transformable LED gave us the chance to create a transparent, 360° moving video element, unprecedented in this industry. It is the icing on the cake of this design.
U2’s 360° Tour kicked off in Camp Nou, Barcelona, on 30 June. The 360° Tour derives its name from the unique environment it creates for spectators. The band performs in the middle of the audience, on a stage that is designed not to obstruct a clear view of the show for anyone. Barco’s flexible LED technology was the ideal choice for this spectacle’s visualization.

The stage and show were created by long-time U2 designers Willie Williams and Mark Fisher. With the help of Chuck Hoberman, partner XL Video and Barco’s Frederic Opsomer, their vision of a 360° moving video screen was turned into reality.

“We wanted to create something that was bigger than a conventional stage. This tour was big enough to make a purpose-built structure,” says Mark
Fisher, U2 stage designer, “I wanted to create a transparent stage and really needed a video screen that would fit in that environment. Barco’s flexible LED technology gave us the chance to create this. We were happy to be working with Barco again, they have helped very well in the past and have delivered an extraordinary product for this show.”

Barco provided more than 500,000 transformable LED pixels (FLX-24), which were integrated into a transformable structure designed by Barco and Mr. Hoberman. The resulting giant LED screen has a diameter of 24 by 16 meters.

“The screen is like a living thing. It continuously changes shapes and forms, and the video acts like live skin on it. It is one of the most fascinating objects in the world now,” says Chuck Hoberman. In addition to the giant LED screen, Barco integrated a total of 1,200 customizable FLX-60 pixel modules surrounding the edges of the A and B stages as well as the bridges.

Willie Williams, U2 show designer, says: “Video is the most powerful tool you can have on stage. But now that video is so ubiquitous in rock stage settings, we needed a very extreme change of canvas to be heard. The transformable LED gave us the chance to create a transparent, 360° moving video element, unprecedented in this industry. It is the icing on the cake of this design.”

Frederic Opsomer, Vice President of the Barco group that designed the LED structure, adds: “The LED video market for concert touring has been evolving constantly, first from fixed to moving screens, and to transformable screens now. The entertainment business is constantly asking for new and innovating products, even in these difficult times, and the U2 360° Tour is a perfect example of this. This was the fifth time I have worked with U2, and I felt honored to be called upon again.”

www.barco.com/en/events/references/U2

Transformable LED: how does it work?

For more information about the revolutionary transformable LED system, read the article on p24.
Slated for a 6 November release, “Disney’s A Christmas Carol” is a multi-sensory thrill ride re-envisioned by Academy Award®-winning filmmaker Robert Zemeckis that captures the fantastical essence of the classic Dickens tale in a groundbreaking, performance-capture 3D motion picture event. In anticipation of the movie, “Disney’s A Christmas Carol” Train Tour, sponsored by HP and driven by Amtrak, offers audiences a behind-the-scenes look at the making of the movie, culminating with the 3D sneak peek of footage. The US nationwide 40-city whistle stop tour made its debut at Los Angeles’ Union Station on 22 May and will reach its final destination, Grand Central Terminal New York, on 30 October.

We’re thrilled to be using state-of-the-art projectors from Barco to showcase these incredible scenes from the exciting ‘Disney’s A Christmas Carol.’

“Disney’s A Christmas Carol” Train Tour has Barco’s DP-2000 digital cinema projectors on board for the entire journey. Disney has selected Barco’s state-of-the-art projectors to provide the public with a special sneak peek at its spectacular new holiday release, in a traveling 120-seat Disney Digital 3D™ theater that will be erected at each stop along the way. For each showing, Dolby Laboratories will provide its Dolby® 3D Digital Cinema technology, which when combined with Barco’s DP-2000 projectors, delivers realistic color and sharp images on standard white screens. Lylle Breier, senior vice president of Worldwide Special Events for Walt Disney Studios Motion Pictures, said, “We’re thrilled to be using state-of-the-art digital projectors from Barco,
and the latest 3D technology from Dolby Laboratories, to showcase these incredible scenes from the exciting and ground-breaking “Disney’s A Christmas Carol”, directed by visionary director Robert Zemeckis. This allows us to present images from the film in the best possible way, and to demonstrate the excitement that awaits moviegoers this November. The train tour is free to visitors of all ages, and we know that everyone is going to have a great time exploring the four custom-designed rail cars, and participating in the fun activities, and demonstrations that go along with it.”

www.barco.com/digitalcinema

25 years of 3D expertise

Barco was one of the first companies to offer high-quality 3D projection for professional industries that needed it to streamline work processes. Today, applications of 3D include automotive design, geophysical data analysis and various forms of scientific research. With the recent popularity of 3D cinema, Barco can reap the rewards of a decades-long experience with stereoscopic visualization.
Medical imaging

Five trends that will shape the future

In the past decade, medical imaging has undergone a spectacular evolution. We succinctly present you the five trends that will shape the future of medical display technology.

Most hospitals around the globe are in some stage of PACS (Picture Archiving and Communication System) implementation. Hospitals realize that this will be imperative to manage the exploding volumes of images created by the newest imaging devices. For example, multi-slice CT images have evolved exponentially from two to 64 slices, with 128 and 256 as the most recent innovations.

1. **Size matters**

   One of the elements that contribute to more efficient reading is screen size. Radiologists are under constant pressure to read more studies within the same timeframes, an evolution prompted by the rapid growth of images, the ageing population and the broader basic healthcare coverage in many countries. Larger workspaces enable physicians to visualize more content on a single screen. Barco led the way in this area with the introduction of its Coronis Fusion 6MP DL, the first 30” color display for multi-modality diagnostic imaging. Instead of a traditional setup consisting of two 20 or 21” display heads, radiologists can now compare initial, prior and current studies much more efficiently.

2. **The resolution evolution**

   Traditionally, the majority of a healthcare facility’s PACS workstations are 2, 3 and 5 megapixel displays. But this 5 megapixel frontier is under pressure. For example, as digital mammography screening devices become more advanced, display monitors must keep up with this new level of sharpness and accuracy. Mammography is no exception: in operating rooms, we can see a similar movement towards higher resolutions.
3. **Color on the rise**

As color technology is being further perfected, color displays are becoming a viable option for diagnostic reading. Conventional PACS workstations usually combine two grayscale displays with a third display head for RIS/HIS-administration and occasional color imaging. But we are now seeing a shift in the direction of all-color configurations. The fact that more and more web-based PACS software integrate color in their interface strengthens this trend. Moreover, healthcare institutions realize that choosing color is an excellent protection of their investment in times when color modalities are gaining ground.

4. **QA grows more important**

Healthcare facilities invest a lot in their image acquisition technology to create high-quality images. This is obviously good for the patients. However, no matter how perfectly detailed an acquired image is, it will only be as good as the display you’re viewing it on. Images must look the same when viewed on different workstations and at different times. To achieve this continuous DICOM-quality on every monitor throughout the facility, hospitals are increasingly rolling out a central, online system for calibration and quality assurance (QA), such as Barco’s MediCal QAWeb.

5. **DICOM-quality everywhere**

Modern healthcare demands more patient images and data to be accessible beyond radiology, in every hospital department. For these multimodality environments, conventional computer monitors don’t meet the Digital Imaging and Communication (DICOM) standards. That’s why more and more facilities are standardizing on dedicated clinical review displays. These monitors don’t always need a very high resolution but must still deliver DICOM-calibrated accuracy. This tendency inspires us to further diversify our display offering.

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**Technology lends a helping hand**

As mentioned above, a number of converging trends and evolutions are quickly transforming medical imaging and healthcare in general and they will continue to do so in the years to come. But no matter how advanced the technology, it will always remain a tool and the actual diagnoses will continue to require interpretation and judgment by well-trained specialists.

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[Barco's website](http://www.barco.com/medical)
1. At the riveting machine in Poperinge
2. Barco often sponsored cycling competitions
3. Barco lottery with juke-box prize
4. Barco promotion van 1937
5. Trade fair in Ypres around 1950
6. Barco radio car
7. The first generation of black and white televisions
8. TV model around 1955
9. Belgian national broadcast station
10. Barco promotion bus
11. Lab equipment 1959
12. Modular TV chassis, a Barco specialty
13. The famous Barco video wall
14. Studio with Barco CTVM 2 broadcast monitors
15. Video projection aboard airplanes 1981
16. Early 3D projection demo (mid '80s)
17. The Poperinge component facility
18. Production line of color TVs
19. Archimedes workstation for graphic design
20. Training of Indian engineers at the CRT lab
21. Opening of Atlanta offices
22. Medical displays replacing film for radiology
23. Testing machine for coils and transformers
24. King Albert II visiting Barco Kourn 2001
The year 2009 marks the 75th birthday of Barco. Throughout the decades that have passed since Lucien De Puydt founded the company 1934, Barco has covered a vast number of different markets and products.

Originally, Barco’s name was an acronym for “Belgian-American Radio Company”. It manufactured a popular brand of radios that quickly gained renown through their forward-thinking technology and clever marketing approach.

In 1949, Barco made its first strides in visualization with a multi-standard television. Located in the convenient overlap zone between different signal standards, it became the recognized leader in that field. In 1967, Barco was one of the first European companies to introduce color TV. Building on this expertise, Barco successfully entered the professional broadcast market in the late ‘60s.

From the ‘60s and onwards, Barco branched out into numerous other activities, which included mechanical components for industrial use, and quality control monitoring for the textile and plastics industries.

1979 saw Barco’s first forays into projection technology. It pioneered the innovative development of cathode ray tube (CRT) projection aboard airplanes, which would jumpstart Barco’s entry into the projection business. The coming years also reoriented Barco as a company focused solely on professional markets.

In the mid ‘80s, Barco became the prime projection technology supplier for computer giants IBM, Apple and Hewlett-Packard, setting industry-wide standards. By 1991, Barco’s market share in the graphics projection market alone reached a staggering 75%, and the company had established offices spanning the entire world, including regional headquarters in the United States and East-Asia.

Through the ‘90s and the first decade of the new millennium, Barco was involved in pioneering and pushing new display technologies such as liquid crystal display (LCD), light-emitting diodes (LED), Texas Instruments’s Digital Light Processing (DLP), and later, liquid crystal on silicon (LCoS) for a variety of applications from corporate boardrooms to cockpit displays, control centers, medical imaging and simulation.

Today, Barco is known as a developer of comprehensive display system solutions with a strong focus on a number of selected key markets. Of special interest is the emergence of the digital cinema market, and the rising adoption of 3D, which Barco has pioneered in since the mid-’80s.

www.barco.com/aboutbarco/en/history.asp
Located on the corner of one of the city’s busiest intersections, Melbourne’s Young and Jackson’s hotel is an ideal location for eye-catching advertising. With the dedicated support of Barco, APN Outdoor installed Australia’s largest digital billboard on top of the hotel.

“This was the first screen we had developed on this scale,” explained Paul McBeth, APN Outdoor’s General Marketing Manager. “And for Australia, it was a premiere in large-size advertising in such a prominent location.” Additionally, APN Outdoor required a screen life of around 100,000 hours. After demo and selection procedures, it was convinced Barco would deliver the best-in-class digital billboard. Barco’s job was a challenging one, because it was charged with full project responsibility. And once the tailor-made structure was designed, all had to be mounted on the hotel roof within a very short time span, without hampering the busy traffic at the square.

Today, the Young & Jackson’s Hotel houses a curved advertising display stretching 37m in length and 3.5m in height. Its LED tiles offer high-resolution and superb contrast levels, even in bright daylight. And being rugged, dust- and waterproof, they are just perfect for Melbourne’s environment. “The display functions perfectly during Melbourne’s blistering summer, where temperatures regularly exceed 40°C in the city center,” McBeth said.

Its unique location, large size and performance make the new digital billboard much appreciated, both by the customer and its advertisers. “We have been overwhelmed with the response we are getting, and the site is heavily booked for the remainder of 2009 and beyond,” McBeth concluded.

www.barco.com/ohm
MultiSense Communications is one of Europe’s leading suppliers of healthcare focused voice, video, data and web conferencing solutions. Recently, during a live open heart surgery operation at the Imperial College Hospital in Hammersmith, UK, an entire heart valve repair procedure was captured and transmitted to a professional audience of over 70 people, with a mobile telemedicine system from MultiSense and Barco’s HD surgical display. The system provided viewers with a real-time, two way communication link between the operating theater and the conference room. Thanks to the surgical display’s intelligent picture-in-picture functionality, the audience had a high-definition view of the operation on screen, including local and remote camera images, the patient’s vital signs, and the endoscopic video of the operation.

Cardiac surgeon Dr. Prakash P. Punjabi was very enthusiastic about the system: “The most important aspect of the solution is the excellent quality of the patient images. The Barco MDSC-2124 surgical display guarantees excellent performance under high ambient light conditions. Moreover, its HD resolution improves depth perception, enhances hand-view coordination and allows for better patient care overall.”

“Barco’s surgical display was the obvious choice for our MultiSense conferencing system,” Andrew Graley, Director of Healthcare Solutions at MultiSense explained. “With a wide range of connectivity options, it gave us the functional versatility we were looking for. In addition, the MDRC-2124 monitor sets itself apart with its sealed and fan-less housing which allows for easy cleaning and disinfection, and offers protection against ingress of liquid, dust and other substances.”

www.barco.com/medical
Rheinmetall Defence Electronics GmbH (RDE) is one of the world’s top suppliers of nautical simulation systems. For their new MTC Marine Training Center in Hamburg, they needed a simulation environment capable of providing first class maritime education and near-real training. Moreover, the simulator system had to offer research capabilities for harbor design, ship efficiency, human behavior and environmental research studies.

RDE opted for an immersive 360° ship bridge simulator, powered by twelve single-chip DLP Barco projectors. “We chose these projectors specifically for a number of features. These included support for night vision goggle training, software to tune color and brightness levels to our own needs, and multi-channel features that allow the entire system to present a composite image free of disturbances,” adds Mrs. Kampe, Project Manager at Rheinmetall Defence Electronics GmbH. An additional technological advantage of Barco’s projectors is their innate warping technology. This ensures that images on curved surfaces will be geometrically correct.

“A state-of-the-art simulation center such as the MTC needs to present a realistic look and feel. Therefore, it has been equipped with one of the best projection systems available,” concludes Mrs. Kampe. Bearing this in mind, RDE is currently setting up an ANS 5000 Professional reference ship handling simulator at their Bremen facilities. Again, Barco projection technology was chosen to guarantee the comprehensive up-to-date nautical simulation for RDE’s designated customers.

www.barco.com/simulation
Multi-agency collaboration in Northern Virginia

The inauguration of Barack Obama in Washington D.C. was the baptism of fire for the McConnell Public Safety and Transportation Operations Center (MPSTOC). The new center, which consolidates multiple safety, transportation and emergency agencies, served as the hub for state activity that day. Operators kept an eye on key roads and bridges on recently installed Barco video walls.

MPSTOC is a state-of-the-art building, set up to enhance the county’s public safety and traffic management. Polysonics, the center’s design consultants to HOK Architects, were pleased that Barco technology was included in the awarded contract. “As design consultants, we try to know all the technologies on today’s market and choose the technology that best meets our customer’s requirements,” said Howard Schlieper, Vice-President of Polysonics.

“Barco offers a superb visualization concept whereby all video and data are available via the network for all operators, whether or not they are in the same control room. Moreover, they have a unique stitch-screen technology, ensuring a seamless transition between the projection modules, which quickly won us over. The visualization solution is also exceptionally strong when it comes to streaming video,” Schlieper continued. “Barco users testified that its streaming video card allows the simultaneous processing of streaming video signals from different manufacturers. With this ability, MPSTOC can support up to and beyond the 300 traffic cameras across the entire Northern Virginia area. Barco’s ability to scale and support such large signal counts and its flexibility for universal decoding made its solution a great choice for MPSTOC. We have complete trust in the reliability of Barco’s solutions.”

Barco’s ability to scale and support such large signal counts and its flexibility for universal decoding made its solution a great choice for MPSTOC.
With an audience reaching between 15 and 20% of the Spanish population, Telecinco can confidently call itself one of Spain’s leading broadcasters. It operates from the Spanish capital of Madrid, where over 1,180 staff work in state-of-the-art studios.

In the brand-new news studio control room, operators use Barco’s cutting-edge Networked Broadcast Monitoring System (NBMS). An in-depth market analysis proved that Barco’s IP-centric solution was the best option. “No other supplier could offer a solution that was this future-proof, with such a level of flexibility,” said Luis Miguel Gonzalez, Project Manager at Telecinco. “Moreover, past experiences had convinced us of Barco Spain’s service level and deep-rooted know-how. Barco offers innovative technology at great value for money.”
Thanks to its distributed architecture, NBMS allows Telecinco to distribute video sources and metadata over an IP network across the broadcasting facility, ready to be viewed anywhere. “As our facility grows and becomes more complex, we have to monitor more signals from a variety of sources. The fact that all sources are now simply streamed over the network and can be displayed in any room is invaluable. Furthermore, we can share the signals between different rooms and locations, so that many different people can view and use the same stream of images simultaneously,” Gonzalez explained. A crucial factor in Telecinco’s selection of Barco was the solution’s scalability. NBMS allows the broadcaster to expand the number of inputs and outputs unlimitedly, at any point in time, so that its monitoring capacity can grow as it further expands its activities.

No other supplier could offer a solution that was this future-proof, with such a level of flexibility.

www.barco.com/broadcasting
Playing with pixel blocks

Transformable, flexible – the future of LED

LEDs or light-emitting diodes have firmly come to the forefront of modern large-scale visualization technology. One of its very recent evolutions happened at Barco. We talked to Joost De Frene and Rick Buskens, Product Managers at Barco.

Barco recently introduced the transformable LED to the integration and events market. What prompted you to design this product?

**Joost De Frene:** Having a LED display in any shape, size, outline, resolution and with any pixel density a customer wanted, would provide them with the ultimate in terms of flexibility. We felt it would allow our partners to truly let their creativity reign freely. It is also a challenge to the traditional notions of video on stage and buildings. Because of its architecture, the transformable LED can be arrayed into three-dimensional shapes and blend in with designs more easily.

**Rick Buskens:** By attaching our LED pixels to inter-connectable carriers, we created standard building blocks for our customers to use. A great comparison is building blocks for children – they may buy a set of blocks that forms a castle, but they can easily tear down the castle once they grow bored with it, and make a submarine out of it.

**De Frene:** Because each pixel is connected individually to a socket, it also makes service so much easier. On a classic LED string, once one diode is damaged, you have to replace the entire string. Not anymore.

How did the events market respond to this product?

**Buskens:** I don’t think I’m exaggerating when I say that our partners were absolutely thrilled. It was like they had finally found a Holy Grail for events, and they started coming to us with lots of ideas. In the past, a customer checked what types of LED products we offered and had to base their ideas off of this. Now, seeing that we just had flexible building blocks, they came with their crazy ideas to us first, which then turned out to be actually possible. It’s great to see how the transformable LED inspires them.

**De Frene:** There’s also been a great interest from the fixed installation market. This is mainly because our transformable LEDs are designed and tested to withstand the threats of outdoor use, such as water, heat, radiation, bright sunlight and dust. The cabling system allows more possibilities and freedom than ever before.

What are your final thoughts on the future for the transformable LED?

**Buskens:** The pioneering work we’ve done now has given us an edge that we can exploit further to remain ahead of competitors. In highly competitive, rapidly changing markets, this is very important.

**De Frene:** We’re optimistic. We have released a product that no other competitor has, and it’s really challenging the way people think about LED installations.

For their latest tour, world-famous rock band U2 uses Barco’s flexible LED technology. Read more on page 4.
In the world of image processing, bandwidth is king. That’s why Barco has introduced the FSN Series — the world’s first multi-format video production switcher that’s ready to handle 3Gbps signals. This format is poised to become a standard for ultra-high resolution content. Within an industry already saturated with low- and high-end switchers, the FSN’s launch did not go by unnoticed, winning a coveted Mario Award at the annual NAB show for a perfectly targeted “mid-market” switcher.

Barco’s FSN is more than just a future-proof switcher. As a fully-integrated solution, it effectively replaces multiple processing devices with a single unit that’s easy to set up, intuitive, and highly cost-effective.

Beaming with confidence

In March 2009, Barco shipped the first units of its new automated wash luminaire, the SHOWBEAM 2.5. We met Regional Product Manager Abbe Westerlundh to give some inside information about this product.

What makes the SHOWBEAM 2.5 unique on the lighting market?

Abbe Westerlundh: Our SHOWBEAM 2.5 is unique in a number of respects. As a 2,500 watt, dedicated wash light with a 140,000 lumens light output, it is the industry’s brightest automated wash fixture. What also distinguishes it, is its innovative twin beam effect and LED tracking ring.

Tell us more about the Twin Beam effect, please.

Westerlundh: The concept is a simple one to understand, but not an easy one to execute technologically, which is why we are proud to have pulled it off so well. Basically, two discrete hard-edge beams exit the fixture on command, with variable control over the Twin Beam’s deviation and rotation speed — all with little brightness degradation. Users may vary the Twin Beam by adding incremental color with the CMY color mixing system. All of this results in more options for stage designers and show managers for intricate effects.

What tours has it been used in so far?

Westerlundh: Bands such as No Doubt, The Crystal Method and Aerosmith used them in their latest tours, for example. In general, our customers are very impressed with the brightness and colors of the SHOWBEAM 2.5, and feel that their creativity is tickled by the twin beam effects. Event companies are constantly looking to outclass one another and do something truly unique — and they feel they can just do that with our wash luminaire.
On 18 June, Barco and Cinemark Holdings Inc., the world’s second largest motion picture exhibitor, announced an exclusive agreement with Barco. As part of this agreement, Cinemark is partnering with Barco, Texas Instruments’ DLP Cinema® product group and media server provider Doremi. This group of partners will employ the full spectrum of Barco’s upcoming new family of enhanced DLP Cinema next generation 4K projectors. Terri Westhafer, Director Business Development for Barco’s digital cinema business, projects the future.

What if viewers could enjoy the first all-digital 4K resolution on a 90-foot cinema screen? What if exhibitors could have DLP Cinema reliability and low cost of ownership — with the highest pixel diversity and color accuracy? This remarkable scenario will illuminate theater screens next year.

Optimizing the big screen

Barco’s 2K digital cinema products offer customers a wide range of choices, with the ability to customize systems for individual auditoriums. Using the 2K solution, the economic paradigms and cost reductions have helped Barco achieve broad market accolades and acceptance, but the focus is now shifting to a new challenge — optimizing the big screen experience. In a recent side-by-side test, Barco’s 2K projector delivered superior image quality than the competitor’s 4K system — yet our customers have asked us for a 4K, premium quality solution for very large screens — specifically, 90+ feet for 2D presentations, and up to 75 feet for 3D.

In response, Barco, in close partnership with Texas Instruments (TI), will proudly introduce “Enhanced DLP Cinema 4K®” in 2010. This is the next step toward strengthening and expanding our product portfolio — with image quality and light levels exceeding anything seen to date.
Supporting the big screen

The world’s cinema festivals bring top-notch entertainment, world-famous movie stars and acclaimed directors together with their audiences. Barco is a notable supporter of these events, as they are a perfect opportunity for showcasing new talent, new movies and new visualization. In addition, film festivals lead the way in what audiences expect of future cinema in terms of viewing experience. In this case, the future is digital.

Recent festivals which prominently featured Barco’s digital cinema projection were the 62nd annual film festival of Locarno in Switzerland, and the 59th international film festival of Berlin, famous for its Golden and Silver Bear awards. In the near future, cinema fans can expect to see Barco visualization in action at the Flanders International Film Festival in Ghent. So, who knows that next time you go to the movies, you’ll have a date with Barco.

The right solution

Exhibitors should never have to mask down their largest screens, nor should they be required to pay 4K prices for 30 foot screens — where 2K projection remains ideal for their customers. With these principles in mind, Barco creates the right solution for the right-sized screen. Our research suggests that exhibitors will place Enhanced DLP Cinema 4K systems on their showcase screens, while 2K projection systems will continue as the industry workhorse — excelling at total cost of ownership, with flawless DLP Cinema image quality. Barco’s Enhanced DLP Cinema 4K products will be designed to bring first-class, luminous visual experiences to the largest screens, where the approximate 20% price increase is appropriate — remaining a true value proposition.

Projecting 2010

Building upon the ingenious modular design of our existing offerings is a three-tier introduction: the incorporation of many exciting features into our next generation DLP Cinema 2K equipment, an innovative line of “4K Ready” projectors in Q1 2010, and a new line of Enhanced DLP Cinema 4K projectors in Q4 2010.

Currently, exhibitors worldwide are eagerly transitioning to digital projection technology, and DLP Cinema is enjoying considerable growth — with nearly 1000 screens being converted each month. In the coming year, we expect those numbers to rise even higher, because theaters are tailoring their business models to incorporate digital at all their locations, rather than selected cinema complexes.

This trend is driven by 3D, as well as the patrons’ expressed desire for sharp, clean, pristine presentations. We welcome the advent of Enhanced DLP Cinema 4K to provide an all-encompassing solution for our customers’ auditoriums, regardless of configuration or screen size. We will continue to project the future — it is our commitment to you.

First to market

To inaugurate the 4K deployment, Barco will have next-generation “4K Ready” projectors available in Q1 2010. By performing a software upgrade and exchanging the light engine, these projectors may be easily updated to Enhanced DLP Cinema 4K. Given Barco’s proprietary modular design, the engine swap will be simple to perform, taking less than five minutes. Even though Barco is dependent upon TI timelines, delivery of a new family of Enhanced DLP Cinema 4K projectors should commence in late 2010, with Barco being the first to market with production 4K DLP systems.
Modern-day traffic management centers, security rooms and broadcast centers have a plethora of sources to analyze and keep track of. While display systems with clear, accurate colors and high resolution can help operators make sense of all information, it’s how these sources are managed and collaboratively used that makes the difference for smarter data management.

“When we conceived our brand new networked visualization platform, we had a number of important considerations in mind,” says Steven Ooms, Director Product Management Networked Visualization at Barco, “These considerations are the four P’s. The first one is place. Work is getting more and more decentralized, so people need remote access to sources. The second one is people, which includes ergonomics and usability. The third factor is the process – everything in a modern control room has become interdependent. And the fourth one, ultimately, is the total performance.”

Comprising hardware as well as software, Barco’s networked visualization platform is pivotal in all steps of the data and video management cycle. All collected sources, whether or not routed through Barco’s bundle of encoders, decoders and mixers, can be arranged in any type of practical layout. This, in turn, is done with Barco’s user-friendly software that comes with the platform. But these applications go beyond knowledge generation. With the software, and through a company’s existing IP network, all data can be flexibly distributed to any number of other control rooms and users, whether locally or remotely. Ultimately, having access to the same sources in real time, in a user-friendly way, allows for truly collaborative decision-making.

“Our networked visualization platform does more than create a composite picture of all sources. The video wall itself is also a source in this decentralized network, and allows freedom in what sources are needed by which operators. As an example, information from the main control room in a traffic management center can be re-used by police forces or fire brigades in case of incidents. As such, we really feel that this solution allows for smarter and better decision-making between different stakeholders,” concludes Mr. Ooms.

**Key benefits**

- view information from anywhere inside the control room or across multiple control rooms
- share information inside or outside the control room in an easy way
- bridge distances between control rooms or agencies cost-effectively
- view any source format type
- view information on any type of display
- expand a control room configuration cost-effectively
LED-lit, durable video walls

Traditionally, video walls for control rooms or in studio environments consist of an array of DLP cubes. While there has been a lot of progress in terms of durability, consumables such as lamps and color wheels will still need replacement. The advent of LED-based light sources in these cubes eliminates this hurdle. Thanks to Barco’s extensive experience with LED technology in other markets, it was able to develop its own new engine for such cubes, as opposed to other companies that use third-party technology to do so.

This resulted in the new OL series of rear-projected video walls. Barco’s OL series have a longer system lifetime and smaller system depth, but also remove the environmental risk of exposure to mercury during system disposal, rendering it a greener alternative to traditional DLP cubes. In addition, the new OL series offer the well-known Barco Sense® brightness and color adjustment technology, which results in one smooth, accurate picture across the entire screen, and over time.

Shallow is good

Barco releases tiled LCD video wall

Video walls keep evolving with the latest trends in technology, towards ever more efficiency. The LED light source in DLP video walls is one such example (see the article above). Another example is the LCD-based video wall, which is geared towards rooms where space is not a commodity or where cost-effectiveness is the primary concern. Barco has now also entered this market with the NSL-4601 video wall, building on its legacy of LCD expertise in a variety of other markets.

“Forecasts for our NSL-4601 are looking good,” says Mathieu Massart, Director Product Management Displays at Barco, “for companies in the security or utilities business that don’t need or can’t invest in DLP cube technology, our tiled LCD wall is a very attractive alternative, especially with our networked visualization suite. It has even caught the eye of the digital signage as well as the broadcast market, both as a space-efficient backdrop or for monitoring purposes.”

High definition for tight spaces

In its family of rugged displays, Barco is introducing a 30-inch single-operator display designed to meet harsh environmental conditions. Boasting a wide 178° viewing angle and a WQXGA resolution, it is set to become the most ergonomic display solution for tightly confined spaces such as shelters and mobile ground stations. The HD-30 debuts at this year’s DSEI exhibition in London, from 8 to 11 September, and Washington DC’s AUSA exhibition from 5 to 7 October.

New 17” broadcast reference monitor

Last year, Barco released the first true grade-1 LCD reference monitor for the post-production market, the RHDM-2301. With a 23” display surface and a native full HD resolution, professionals lauded its color calibration and motion reproduction, both essential to ensure that it delivers the quality expected from a grade-1 reference monitor. On this year’s IBC show in Amsterdam, from 11 to 15 September, Barco offers a sneak preview of a new family member in the RHDM line, a 17”, full HD rack-mountable grade-1 monitor.
In each issue of redefine, Barco’s CTO, Jan Willem Brands, talks about technology central to modern-day professional visualization. The first article in this series discusses the origins, applications and future of LED-technology.

Light-emitting diodes or LEDs have been around for a long time, though they were invented almost by accident. In 1927, Russian radio engineer Oleg Vladimirovich Losev created the first LEDs after noting that diodes in radio receivers started emitting light when electrical currents passed through them. But it wasn’t until the 1960s that the LED was adopted worldwide as an everyday practical electronic component. This type of LED is still what people think of most often when they hear the word – a small, low-intensity red light diode. However, LEDs are now available in all types of colors and brightness levels, and have branched out to an increasing number of applications.

While first used as status and indicator lamps, LEDs have recently become a serious alternative for traditional display technologies and light sources through a number of consecutive technology breakthroughs, and the numerous advantages it has over many other lighting types.

Basic principles

Through an effect named electroluminescence, electrons in the LED combine with holes inside the diode, and release energy in the form of light. This light’s color is determined by the energy gap of the semiconductor diode. The first devices were made with gallium arsenide, which produces red and infrared light, while later advances have made much shorter wavelengths possible, resulting in a greater variety of colors. For examples, diodes made with indium gallium nitride can result in green, blue or violet light.

If the emitting layer in the LED is organic rather than inorganic, it is called an Organic Light Emitting Diode (OLED), which is poised to make serious headway in television, decoration, cell phones and portable music players as they can be printed onto flat circuits. While traditional LEDs show one color, in the
last decade, LED packages have been developed that can alternate between two, three or even four colors by driving together several diodes. In large-screen displays, LEDs can either be discrete and separately mounted, which is typical for outdoor applications, or are surface-mounted panels, which is more usual for indoor applications. Recent developments in the field of large-scale LED displays have resulted in the so-called ‘black LED’ from Barco, which maximizes contrast and color accuracy without impairing color brightness. This was achieved with a black silicon filling, which preserves black levels and allows a phenomenally higher contrast in indoor venues.

In an article for international AV organization InfoComm, Kevin Dowling, Vice President of Innovation for Philips Color Kinetics, notes that “since 2004, LEDs continue to improve at pace that the industry is astonished by. Efficacy, light output and quality are improving faster than we projected.” Analogous to Moore’s law in IT, the efficiency and brightness levels of the latest LED products is increasing exponentially, with a doubling expected each 36 months. This is largely due to developments in semiconductor materials and optics.

**Applications**

LED technology is used for a wide variety of applications that are only tangentially related to its original role as a small light and display source for micro-electronic devices. LEDs are ubiquitous. From message displays on public transport, infrared remote control LEDs and low-key growth lamps in greenhouses to small, bright lights in decorated lighters or cell phones, LEDs are a part of every day life.

Yet, most average consumers will be surprised to learn that what they see on giant digital billboards are, in fact, also LEDs. The difference here is that the LEDs for large-screen visualization are designed differently, with much more attention to brightness and color accuracy, as stated earlier. But LED is also making gains as an alternative light source to traditional lighting methods, for example in LCD displays and in projection technology.

**High-end LED walls**

In the creation of high-end LED displays, as with any display system, color and brightness uniformity play a pivotal role. In fact, many big LED displays have known issues with color uniformity, because individual LEDs vary slightly in color level and at a large scale, produce an unwanted, uneven stripe-like effect across the display. In same article for InfoComm quoted earlier, Miura Mamoru, Product Manager for LED products at Barco, states: “When we choose LED components, we make sure it is from the same batch or bin to ensure even color over the display. We have a strict selection process and each component must meet a high quality standard. If there are LEDs from different bins on the same display, we can adjust the levels and produce uniform color. It is a very involved process to make sure the uniformity of the display continues for the life of the product.”
Another consideration when making LED displays for indoor and outdoor use is the environment. A typical LED billboard will have to withstand rain, dust, intense heat and cold or other circumstances, and still run smoothly. This is why Barco has pursued and received an IP-65 certification for its LED products, which guarantees that they are waterproof and highly resistant to other pollutants or potentially debilitating factors.

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**LEDs as backlights in flat panels**

Traditional LCD displays have their own internal backlighting system, which uses a set of layers and filters to illuminate the screen from the backside so that the light can flow through the LCD panel to create a picture. However, LED is becoming an increasingly attractive alternative as a backlight source for professionals that perform image-critical work. This includes pilots, whose correct interpretation of on-screen signals in dark or difficult circumstances can make a difference between success or failure, or post-production professionals in the broadcast industry, who demand the exact same colors and contrast levels on their work display as present on the captured source files.

The advantages that LED offers here are an increased color gamut, higher brightness levels and a longer product lifetime when compared to normal LCD backlights. It also narrows down the amount of light that needs to be filtered, because the colored LEDs match the colors of the screen very closely, thus increasing both color saturation and light efficiency of the entire display. According to research, the color gamut gain is as much as 45%. In addition, because less filter layers are needed, the displays can become slimmer and more attractive from a design as well as an ergonomic point of view.

**LED as a light source in projection**

Thanks to the incremental gains in brightness, LED is becoming popular as a light source in projection. As also discussed in the article on page 29, a LED light source removes the need in DLP projection for color wheels and lamps, both of which are consumables with significantly lower lifetimes than a
Efficiency: LEDs produce a higher light output per watt than typical incandescent light bulbs. They also light up quicker and can be dimmed more easily. And as discussed earlier in this article, LED backlights in flat panels result in a slimmer product.

Quality: By virtue of giving colored light, LED either doesn’t require color filters, or in case of backlighting in LCD displays, it boosts color saturation and overall brightness more than traditional methods. LED light sources alsodim over time instead of suddenly going out.

Environment: LEDs give off little heat in comparison to other light sources and display technologies, and don’t need the toxic mercury that is found in traditional lamps. In addition, LEDs can withstand heavy-duty operations or frequent on-off switching, which renders their product lifetime much longer.

Into the future

The road for LED is a long one, and stretches far into the future. Current issues such as cost and light output are set to be overcome due to the leaps and bounds by which the technology is growing. In addition, more and more control systems enable operators to handle LED displays with greater ease. From the InfoComm article: “On the AV side, adding control systems and networking capabilities will further the value proposition of LEDs even more by adding automatic dimming and other advanced features,” states Kevin Dowling of Philips Color Kinetics.

The industry keeps finding new methods of increasing lumens output per watt, while other developments that increase the power of LED include larger semiconductors, improved heat extraction, a greater variety in diode shapes, increased light conversion efficiency and bundling several LEDs together in one epoxy dome. As noted earlier, OLED is another interesting evolution to watch, especially in applications for the consumer market. While manufacturing costs and efficiency are currently still high, potential advantages of the technology, such as circuit-board printing, an improved color range and a stronger contrast will also see it come into the picture for professional installations. Other approaches, such as nanotechnology, may further contribute to the rise of LED.

Meanwhile, Barco LED video displays continue inspire creativity. An award-winning example is ‘The Comcast Experience’ at Philadelphia’s Comcast Center, which is currently the world’s largest installation of 4mm pixel pitch LED displays. More recently, Barco partnered with U2’s 360° to create an amazing, live, transformable LED skin on stage, and is also covered in this issue on pages 8 and 24.

Key advantages

Chris Link, Business Development Manager for Energy Technologies at Texas Instruments, goes on record for InfoComm by saying that “LED technology presents a huge opportunity because energy is becoming a rare commodity. LEDs are low watt and high lumens. They are also directional in the way they give light. You can design your layout so the light is where you need it.”

Other typical advantages LEDs have over traditional light sources can be broken down into three categories: efficiency, quality and environment.
Collaboration is the “act of working together” and an everyday element of professional life. According to a recent research by PennEnergy, over 70% of oil and gas professionals believes 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, Craig Hodges, US energy and chemicals industry solutions director for Microsoft, says: “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.”

**Collaboration based on visualization technology**

Any solution for collaboration that involves visualization technology is inevitably going to involve IP technology, but these solutions have largely been ill-integrated and hard to use. However, recent years have seen an alternative gaining traction. This alternative comprises hardware (projection, screens, display management, structures) as well as software, all from the same manufacturer. Its collaboration approach offers the following functionalities:

- Integration of a diverse number of hardware, software and networked sources simultaneously
- A Windows desktop environment
- Mouse and keyboard control of the display system. This includes resizing and moving source windows, as well as remotely accessing sources on the network
- 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
Case examples

The PennEnergy survey indicated that about half of the polled professional think “they could save at least an hour every day” with “newer and more effective 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 technology across sites as remote as the Netherlands, Norway and Malaysia. They primarily use large-scale 3D display walls. 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, 3D display wall 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 oil field asset teams located in remote locations around the globe.”

Barco has helped us realize our goals to collaborate faster, more efficiently and in a way that everyone can work with their equipment.
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Barco launches DVE card for the FSN multi-switcher
Barco lights up Dubai’s F1 circuit with 14 LED displays
Barco’s Richard Belliveau is to receive a Visionary Innovator Award from Parnelli for his pioneering work in the lighting industry
Barco enters avionics partnership with Russia’s Monitor Soft
Barco starts production of rugged consoles and computing in Noida, India
Barco completes first major Cinedigm Phase 2 deployment in the digital cinema market
David Niles, designer of the Barco ComCast project, gets an AV Award from AT Weekly
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