Concurrent Design Facilities for the Defense

A multi-disciplinary, collaborative and mission-critical environment.

A Concurrent Design Facility (CDF) is originally an environment where engineers of different specialties come together to perform conceptual design for a project. It is designed as a workspace and information system allowing multidisciplinary experts to co-exist and collaborate within a common focus environment. CDF has proved to be an effective and efficient manner to implement Concurrent Engineering methodology. But these environments are not the prerogative of engineering anymore, and more industries are adopting these highly collaborative environments to bring different disciplines together. The Defense is one industry that is reaping the benefits of CDF within their command centers, deploying adjacent rooms to their main control rooms. Concurrent design principles are used to create secure spaces that bring multidisciplinary experts together to create a common operational picture and improve decision-making.

Improving efficiency with high-performance visualization

Concurrent engineering aims at providing a collaborative and simultaneous working environment to perform multidisciplinary studies. It facilitates faster, and more efficient interaction between all disciplines involved, ensuring consistent and high-quality results. To solve complex problems and take informed decisions, engineers and now multidisciplinary specialists, need to visualize vast quantities of information from numerous sources, on an appropriately sized display and with a superior resolution.

Dynamic and integrated environments

The real value of an integrated, multidisciplinary and multipurpose environment does not come from a single standalone solution, but rather from a number of solutions working together across people, processes, tools and technologies. Bringing them together in a single facility, the knowledge sharing and coordination among different stakeholders within the ecosystem serves to improve and facilitate decision-making.

Facility design needs to move away from the static and single-purpose legacy approach and move towards a dynamic and multi-functional space where the physical and the virtual worlds co-exist. Improved workflow capabilities are possible through seamless integration of for example secure videoconferencing. This allows key remote stakeholders or experts in the field to be brought into conversations ad-hoc and in real-time, so decisions can be taken without delay, thus minimizing response times and maximizing team efficiency.

When designing concurrent design facilities, the physical, virtual and behavioral environments are three key collaboration principles. They will assist designers in ensuring that such environments meet the needs of key stakeholders. The same principles apply to all Cyviz designed environments, irrespective of use case.

The physical environment needs adequate thought put into the layout of the space and the room ergonomics. There is no one size fits all when it comes to the layout for a CDF, the physical design will be based on the number of operators, officers and engineers and how these individuals need to collaborate to support the workflows.

A successful CDF must support the convergence between the physical and virtual, ensuring users can connect with colleagues outside of the space, in other locations or on mobile devices. The right infrastructure that supports seamless integration between different platforms and technologies and ensures that users have access to the information they need is critical.

Maximizing well-being and focusing on human factors will help ensure that the CDF delivers engaging user experiences that keep teams motivated and attract the next generation of operators. Reducing fatigue, improving health and well-being should be key considerations made possible by ensuring optimal light, acoustics, air quality and ergonomics in the work environment.

From a technical perspective, occupancy levels, the room layout, wall space and the required number of inputs and content sources all need to be defined when designing the most suitable concurrent design environment. Equally, and from an appropriate visualization perspective, knowing the aspect ratio, pixel density, resolution requirements and light restrictions for the concurrent design room are crucial at the initial stages of space design.

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Building for a Flexible Common Operational Picture

Defense operations demand a Common Operational Picture (COP) to establish situational awareness. This COP acts as the single shared source of truth for direction and coordination, and ultimately decision-making. The COP requires that information is accurate and can be displayed, moved and dissected in real-time on a central high-performance video wall by required stakeholders. A new generation of COP - a so called Flexible Common Operational Picture (FCOP) needs to be created to accommodate different mission requirements or for cyber incidents due to their ever-changing nature. Technology developments are making it possible to implement more sophisticated solutions to manage the different scenarios, moving between situations and activities as needed.

Security compliance

Cyviz' solutions are designed for the demanding requirements of Defense and Intelligence organizations tasked with implementing command and control centers and decision-making environments that are secure and long-lasting. Our technical staff carry the highest security clearances, and together with our partners we offer the skills needed to successfully implement and support mission-critical systems. The Cyviz system architecture supports DVI-, HDMI, Display Port and IP-based distribution of high-resolution video signals. Switching between multiple sources can be done in a secure and certified fiber-based matrix. Processing of raw video is done without compression, encoding or decoding.

24/7 reliability

Cyviz solutions are designed for the most demanding Government and Defense requirements and built for 24/7 environments. We understand that downtime is not an option, and the monitoring of all system components will detect any potential outage ahead of time. With a consistent system architecture and around-the-clock support, Cyviz' control rooms and operations centers let you focus on solving critical challenges and offer supreme situational awareness at all times.

Promoting collaboration with multidisciplinary rooms

True collaboration requires flexibility and quick transitions between content sources. Zooming in and out, switching content and progressing as a team. Sharing multiple sources simultaneously is vital. Experts from different teams will often join from remote locations in a collaboration session. Cyviz enables multiple video calls that enable full team participation for increased collaboration.

When third parties join a session there should be a seamless participation experience, regardless of what technology they may use. Cyviz' solutions include the ability to provide a large seamless display with full-in-room viewing capability and at decision-enhancing resolution. The technology allows several content sources from various feeds to be displayed on a screen at the same time, together with video-conferencing. For example, during a complex problem-solving session, a battlefield map can be displayed in one window, a field specialist reporting in another and CCTV photage in a third. Operators can move easily from one window to the next, drilling down into details at the touch of a button without having to shift between different feeds. The set up renders itself perfectly for multidisciplinary teams with participants from different disciplines to bring their views and expertise to the table.

Cross industries examples

Image: The multipurpose room in Arup's Boston offices with its blended projection solution creates the perfect canvas for cross functional design, project management and decision-making.

A multidisciplinary BIM room for Arup

Engineering is a complex process and Arup, a global consulting firm, needed a way to bring their resources together. They wanted to use digital tools and drawings in their collaboration sessions to improve decision-making and discussions around complex construction challenges. Effective collaboration is key at Arup and allows the expertise of each member of Arup's multidisciplinary project teams to be combined for better decision-making.

Leveraging our experience, Cyviz designed and supplied a room that would become the perfect seamless canvas for immersive and multidisciplinary collaboration and BIM (Building Information Modelling) applications. The standardized turnkey Cyviz solution consisted of a display solution with three projectors, blended to create one large seamless image together with a control and management system, supported through a centralized server. The model has been deployed across multiple Arup offices and connects teams across their organization.

Image: Design and Visualisation Facility within the LHMCO "Lighthouse", Suffolk, Virginia

Lockheed Martin Design Facility "Lighthouse" Innovation Centre

Lockheed Martin is an American global aerospace, defense, security and advanced technologies company with worldwide interests. The Lockheed Martin location in Suffolk, Virginia is home to the "Lighthouse", a unique center which is a technology hub for corporate-wide demonstrations of Lockheed Martin technologies, with primary focus on Departments of Defense and NATO clients.

Cyviz implemented a solution to address very specific use cases which, due to the multi-classification of operational capability we are unable to disclose. However, the implementation environment is one applicable and comparable to CDF environments.

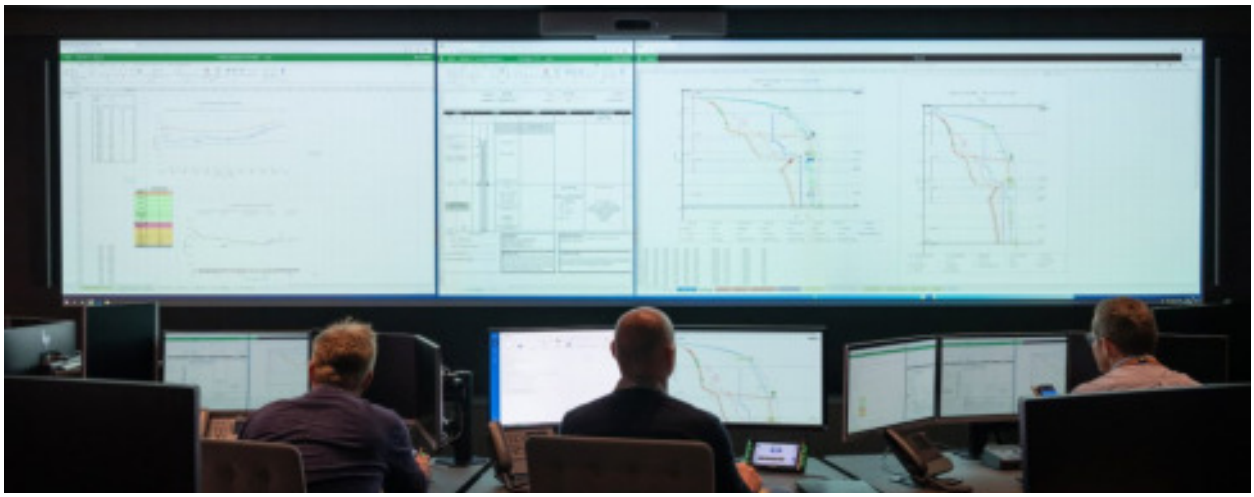

Image: The control room supports a large number of operators, data sources and real-time video collaboration capabilities.

An innovative Onshore Collaboration Centre (OCC) for Aker BP

Aker BP's OCC was designed to bridge onshore and offshore operations, to create situational awareness and increase productivity by having all experts and disciplines in the same space. The 4 collaborations rooms of the OCC are multipurpose in their design and can adapt quickly to different user scenarios, such as traditional meetings, video conferences, multidisciplinary workshops, or trainings.

The rooms are also equipped with large seamless displays that provide a large canvas to share and interact with different applications and content sources. The OCC and the control rooms were equipped with seamless displays for greater image quality. Paired with unique video processing capabilities for Picture in Picture (PiP), this solution creates the perfect canvas for dynamically organizing sources and digital assets to support different operations scenarios.

Image: The atrium is designed as a modern space for town-hall meetings, and multidisciplinary collaborative sessions for larger groups.

About Cyviz

Cyviz is a global technology provider for visual collaboration, meeting rooms, visualization, and operations centers. Since 1998, Cyviz empowers the digital workforce, organizations and employees to connect, visualize, and collaborate on their critical data. Cyviz provides turnkey solutions that are easy to deploy, easy to operate, and easy to support. Today, Cyviz serves the Fortune 500, global enterprise and government customers that demand seamless integration of leading-edge technologies that engage people, encourage greater collaboration, and accelerate decision-making.

Find out more on **www.cyviz.com** or visit one of our Cyviz Experience Centers in Atlanta, Beijing, Dubai, Jakarta, Houston, London, Oslo, Riyadh, Singapore, Stavanger, or Washington DC.

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