



BEST PRACTICES FOR CONTROL ROOM DATA VISUALIZATION

ELECTROSONIC

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Introduction

Control rooms are mission-critical environments. They play an essential role in maximizing operational efficiency, reducing risk, minimizing costs, ensuring regulatory compliance and optimizing business outcomes.

The operator remains key to the success of these environments. They are responsible for analyzing and interpreting real-time operational data from the field to make effective decisions in response to a critical incident or a vital operational change in line with demand or supply conditions.

However, control room environments can be extremely stressful. Operator shift patterns can vary by company and operating location, but they could be as much as 12 hours per day, seven days a week for several weeks consecutively.

Operator effectiveness depends on making fast, accurate real-time decisions based on huge volumes of real-time data from

multiple sources in the field. This volume of data can lead to information overflow so it's essential to identify, prioritize and communicate events that require a rapid response.

Creating an environment centered around the operator and integrating data visualization tools enables operators to present and share the most important information in a clear format and eliminate the risk of information overload.

This briefing paper explains how data visualization is a critical component of an integrated and holistic control room solution that creates a single information dashboard, visualizes data from disparate sources, improves situational awareness and supports collaborative decision making.

By adopting best practices, companies can create a smart control room system that enables effective real-time decision making in mission-critical environments.



Turn unstructured data into situational awareness

Mission-critical companies have deployed increasingly sophisticated technologies and software to inspect and monitor infrastructure and equipment automatically without human intervention. Integrating legacy equipment such as thermal imaging cameras or ultrasound devices with smart tools and utilizing robots, ROVs, drones and augmented reality provides a wealth of data on asset status and performance.

The sources include sensors, mobile devices, video, network equipment, applications, Internet data, the industrial IoT, big data, as well as 'softer sources' such as broadcast television and social media.

Reduce information overflow

The control room plays a central role in taking this data and responding with appropriate actions. These control rooms feature automated techniques, artificial intelligence and sophisticated data analytics to identify issues, speed up decision making and prioritize responses.

By using artificial intelligence (AI) and advanced analytics, for example, operators can identify important data and create rules to automatically prioritize critical events for action. By integrating AI and analytics with unified control room systems, alerts can be presented to operators in ways that provide greater assurance of full situational awareness.

As an example, when a particular sensor is triggered, a feed from a related security camera can be automatically routed to the screen. The audio system can sound an alert, or the room lights may dim or change color until the alert is acknowledged.

Because they are part of a larger team of supervisors, executives, experts and operational and response teams, operators need to reduce information overflow and focus all team members on essential tasks.

However, simple traditional SCADA visualization techniques, such as color change or static icons to reflect status, are no longer sufficient in today's more crowded data spaces. Data visualization overcomes that problem by turning unstructured data into situational awareness.

By providing and sharing clear information, operators can give all participants an easy-to-understand overview and status of events for faster collaborative decision making.

Use data visualization tools and data storytelling to increase awareness

Data visualization tools give control room operators the tools to manage, present and make sense of complex business data. They focus decision makers on the most important issues by clarifying complex data and highlighting trends. These tools help raise awareness and turn data into actionable responses by sharing critical information in an easy-to-understand format.

Data storytelling is an increasingly important part of data visualization. It conveys useful contextual information and enables control room operators to display a step-by-step approach to their conclusions. Data storytelling supports a more collaborative approach to decision making by enabling experts and other participants to provide additional context and perspective.

It's also important to incorporate data trends analysis, a newer feature of control room systems. It's not sufficient for operators to know that a sensor was triggered – they need the tools to understand why a sensor was triggered. Monitoring data trends allows operators to predict what will happen next, and to either prepare for it or to take action to avoid it.





Provide and integrate visualization tools that are easy to use

Data visualization tools should be powerful, but easy to use with an intuitive dashboard that enables operators to quickly visualize data in critical situations without having to think about what they want to do. Real-time data visualization is essential – sometimes, a delay of thirty seconds is too late.

The tools must be capable of combining data from multiple sources through integration with databases and third-party software. They should also provide operators with a broad selection of different graphic formats and should be highly customizable. The software should support purpose-built layouts for specific scenarios that can be saved as templates.

Integrating data visualization tools is important. Integration with AI and support for natural language queries, for example, can speed up analysis. The capability to track trends is important for monitoring ongoing operations or problems.

The tools must be capable of interacting with the overall control room system, making the entire room a part of the information display, not just a box in which to put the display. Integrating and customizing all elements of the data visualization solution helps turn the entire control room system into an extraordinarily powerful tool.

Present consolidated visual information on a single information dashboard

Traditional control solutions based on switching between multiple screens can limit presentation and subsequent decision-making performance. That's why it's essential to present data on a single information dashboard for decision making and collaboration.

Each operator may have the ability to view all sources on a single display, but, when an error flags, the information can be easily moved to a central screen, video wall or touch display so a larger team can work on it.

Team members may be in the control room, in a situation room, in an executive office, in the field, or across the world, but they must all have real-time access to essential information in any format for their role, utilizing integrated permissions-based access. Video walls provide an image space for presenting and sharing the same visual information with all participating decision makers and contributors with any location on any connected device without sacrificing data integrity or security.

Video wall controllers are capable of accepting signals in any format and connecting content to the video wall on a single interface. Associated software lists available content and provides tools for easy management and manipulation.

Data representation has to be flexible because each decision maker will require different views. One may require a single dashboard with a high-level overview, while specialists in different areas may need to review highly detailed, complex information on a single function. Operators can use content mapping to enable information to be displayed in different ways for different operational scenarios. They can configure, change, scale, zoom or highlight any content to improve understanding and response.



Improve critical decision making in partnership with Electrosonic

This brief review explains how effective control room audiovisual design can make a difference by making it easier for operators to make mission-critical decisions based on real-time data. The right control room solution provides an integrated, holistic, collaborative environment where operators can manage, analyze, visualize and share high volumes of data to ensure actionable insights.

However, planning and implementing change in the control room is a complex task. By partnering with Electrosonic, you can access expert advice and guidance, together with industry-leading design, engineering, integration, project management and ongoing maintenance skills and resources to ensure a successful, cost-effective transformation.

Leading Expertise

Electrosonic's experts provide thought leadership and excellence in designing, engineering, project managing, maintaining and supporting control room audiovisual solutions. We leverage 50+ years of global experience delivering consistent results while minimizing risk for technology projects.

Global Scale

Electrosonic offers unparalleled expertise and global reach, together with the skills, experience, and resources to deliver holistic and innovative control room audiovisual solutions.

Converged Methodology

Based on the highest industry standards, Electrosonic delivers quality solutions across complex control room projects and multiple technology disciplines. We understand the installation, integration and maintenance requirements of each control room system that we design, and we leverage converged technologies to create innovative design solutions that reduce the cost of ownership for our clients.



Electrosonic creates innovative experiences by fusing architecture, storytelling and technology.

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