Video Display Walls White Paper

Introduction

The sheer volume and scale of information that is available to an operator can be overwhelming. Studies show that visual representations can accelerate insight into complex data by taking advantage of the human eye's high-bandwidth pathway into the brain, allowing operators to see, analyze, and understand large volumes of information quickly.

Given this, video display walls seem like the perfect technology for a control room. Video display walls can present a comprehensive view to operators and allow them to discriminate between important and unimportant situations.

With so much potential, why does the champion of a video display wall project often encounter so much resistance?

Concerns

The most common concerns relate to the 1) Effectiveness of display content, 2) Continuity of operations, and 3) Ease of maintenance.

1) Effectiveness of content

As anyone who has upgraded his home video equipment will understand, it takes more than a great hardware infrastructure to deliver spectacular results. A large format, high definition television is a good start, but it needs to be fed with high quality content to provide the desired visual image.

The same is true with a control room. The investment in a video display wall cannot be justified if the same content available on the desktop is merely scaled-up to fill a larger display surface. Given that, many organizations elect to build an overview display, specifically for the display wall. This can be a good approach, but the customer needs to determine if the supporting control system is capable of rendering a single display with the quantity and quality of dynamic content that is required for a truly informative system-wide display.

Additionally, if the project involves the replacement of an existing tile mapboard, these walls are often very large. A replacement video wall typically provides less 'real estate' for the operator to view. Can the same amount of content be effectively presented on a wall with less surface area?

2) Continuity of operations

The renovation of a control room is a complex project. The work will occur in the confines of a 24X7 mission critical facility, so new equipment must be introduced without jeopardizing the operator's ability to control the electric grid. This means that operators must be trained to utilize new technologies with the same effectiveness as old equipment, the instant that it is deployed. Additionally, it needs to be reliable, like the static wall that preceded it. In fact, an up-to-date visual representation of the electric system on the display wall is most critical if the complementary control system has failed, which is a particular concern when both systems are served by a common technology infrastructure.

3) Ease of Maintenance

The staff that supports the control center is often overloaded. They have their "normal" job to do, and rarely get additional staff to support new projects. Although maintaining tile mapboards and other legacy display walls is often labor intensive, the level of effort is known and can be worked into the staff's routine schedule. The level of effort required to support the content on a video wall is unknown, but it can't be significant and shouldn't exceed the level of effort required to support the existing display wall content.

Primate Solutions

Primate Technologies, Inc. offers a set of products and services that can be used to eliminate these concerns, resulting in displays with state-of-the-art visualization techniques.

GridGuardian

The solution begins with a real-time data warehouse that includes a diverse array of standard and custom data interfaces. GridGuardian collects data from multiple data sources (EMS, DMS, OMS, etc.), including redundant sources of similar data (when available), and integrates the data into a single real-time repository. Additionally, GridGuardian can monitor the status of operational equipment (servers, communication equipment, field devices, etc.), to determine if there are any questionable data sources. When concerns arise, it generates personalized notifications (text messages, text to voice, email, etc.), and annotates the data with the quality concerns. Finally, GridGuardian provides robust calculation tools that allow sophisticated processing of data.

Display Conversion

Primate's display conversion expertise supports the efficient extraction of display content from many of the most prominent systems in the industry. This can be done as a single-shot, or automatically as source displays are maintained and updated.

BlackBoard

BlackBoard is the most sophisticated visualization tool in the industry. Displays comply with the Scalable Vector Graphics (SVG) standard, so the quality of text, symbols, and graphics is the best that technology can offer. Furthermore, virtually every aspect of these high quality displays can be dynamically controlled, including color, scaling, opacity, and animation. The results are visually appealing, eye-catching, and informative displays.

Conclusion

When these three solutions are combined, P-Tech offers a comprehensive solution including:

- A high-performance visualization tool that can efficiently render displays with 100,000+ dynamic elements.
- Methods to optimize the utilization of display real-estate through techniques like substation magnification and automatic display call-up.
- Intuitive visualization tools and techniques that are easily used by operators
- An independent infrastructure for rendering content on the display wall, so a failure of a control system will not debilitate the display wall.
- An independent visualization tool that can provide data from adjacent systems, when there is a failure of the primary data source.
- Maintenance tools that can automatically extract content from existing systems, with minimal investment of labor.

A video display wall is a substantial investment for a utility. When it is well designed, it can greatly enhance the situational awareness of the control center staff.