Three Effective Visual Management Solutions

Using KPIs to Improve Profitability

White Paper

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Introduction

Strategic philosophies or practices such as Kaizen, Lean Manufacturing, Six Sigma, Total Quality Management and Continuous Improvement are used by many organizations to help improve processes, drive productivity and maintain a competitive edge in today's ever-increasing global economy. Despite varying concepts, each practice uses Key Performance Indicators (KPIs) to assess, analyze and track business manufacturing processes. Even if an organization does not employ formal continuous improvement initiatives, efficiency gains can still be realized by borrowing lessons learned through the visual management techniques of those processes. This white paper discusses three common visual management solutions for displaying KPIs and andon messages in order to drive productivity and improve profitability.

What are Key Performance Indicators (KPIs)?

KPIs are assorted variables that organizations use to assess, analyze and track manufacturing processes. These performance measurements are commonly used to evaluate success in relation to goals and objectives. KPIs tend to vary by organization. A list of seven common production KPIs used on automated plant floors follow: (1) Count (Good or Bad), (2) Reject Ratio, (3) Rate, (4) Target, (5) Takt Time, (6) Overall Equipment Effectiveness (OEE) and (7) Downtime. Each is outlined in Red Lion's *"Seven Common KPIs for Production Monitoring"* white paper.

What is Visual Management?

Visual management is the process of displaying critical information such as KPIs that relate specifically to production output, efficiency and quality. By displaying this data on the factory floor, employees have a better sense of production levels and tend to strive for higher performance. Visual management also provides actionable information that allows supervisors to better monitor performance and determine, in real-time, areas that may need improvement. The overall result helps to drive productivity throughout the organization by increasing efficiency, quality and uptime.

Is Visual Management New?

The value of visual management has been apparent since the debut of the Toyota Production System – Toyota's revolutionary "socio-technical system for manufacturing" developed between 1948 and 1975. One of the 14 principles created by Toyota was the requirement to implement visual control so issues are not hidden. [1]

Over the years, the methods for collecting and communicating KPIs have evolved considerably. Early on, data was collected by a person equipped with a pencil, a stop watch and a clipboard. The information collected was then transferred to large chalkboards. Chalkboards eventually gave way to electronic counters and panel meters with large LED displays. These displays allowed KPIs to be viewed over greater distances. Multi-color, graphical marquees entered the market to replace the simpler LED displays, but higher price points made this solution somewhat prohibitive. As a result of technological advances and falling equipment prices, larger LCD televisions are becoming the industry standard for displaying KPIs on the plant floor.

Three Visual Management Solutions

Solutions for displaying KPIs and andon messages range from stack lights that display machine status for under $100 to complete PC-based production monitoring solutions with prices in excess of $100,000. Three visual management options that many organizations should consider follow:

1. Large 7-Segment LED Displays

Panel meters with large 7-segment LED displays should be considered for applications where only a single numerical KPI is of interest. The sheer brightness and contrast of these displays makes this solution a viable choice for viewing critical values over long distances. Display sizes range from just over an inch to as large as four inches. The former are easily visible at 70 feet, while the latter are readable up to 180 feet. Different versions of these easy-to-use displays are offered to accept standard digital, analog or serial inputs.

2. LED Marquees

LED marquees are displays manufactured with a matrix of single LEDs in various resolutions. Over the last decade, multi-color LED marquees have become a common method of displaying plant floor information. With the ability to display multiple lines, as well as text, this solution is ideal for applications that require the display of more than one KPI. By allowing the display to change colors –

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[1] http://www.strategosinc.com/toyota_production.htm

from green to red for instance – users can more easily draw attention to the display when critical messages such as line down messages need be communicated quickly.

The most important criteria when selecting a marquee is how it collects the data. Some manufacturers offer models with digital inputs while others offer only a serial slave interface. The latter will typically require the user to write the necessary code to "talk" to the display, commanding it to display specific characters in specific formats. The more intuitive models offer built-in communications drivers to communicate directly with automation devices such as PLCs, motor drives and more. This allows for easier data collection, formatting and display. While more advanced than 7-segment LED displays, LED marquees are still somewhat limited when it comes to displaying more sophisticated images such as trend lines and bar graphs. Cost also makes this solution prohibitive, particularly in larger marquee sizes.

3. LCD Television-Based Solutions

The latest trend in production displays arises from the ever-falling cost of consumer-grade televisions. With the ability to display images in high-definition, flat-screen LCD televisions are quickly becoming the industry-standard for displaying KPI information on the plant floor. Early on, savvy users made use of television by running SCADA software on a dedicated PC; the TV was simply connected as a monitor. Today, dedicated solutions are now available for connecting, collecting and displaying plant floor data on any television.

Using Advanced Functionality

When selecting a system to display process performance data, buyers should consider advanced functionality that may be provided at no additional cost. Since productivity displays collect data from automation devices, many of today's more comprehensive products offer built-in data loggers. These products offer the ability to review historical production trends, enabling management to more easily determine what organizational initiatives and processes are effective, and of those, most profitable. By the causes of line-down events, management now has access to information that helps determine problematic lines so that common issues can be resolved.

Today's solutions also offer the ability to keep remote personnel informed via a web-based interface. This allows on-call maintenance or remote managers to keep abreast of process performance. With the ability to send status updates and alerts via text messages or email, these products provide the ultimate in andon communication.

Increasing the Bottom Line

Regardless of the technology solution – 7-segment LED displays, LED marquees or high-definition LCD televisions with logging and remote notifications – information when communicated to the appropriate personnel increases the bottom line by improving efficiency and reducing downtime. With many of these visual management solutions helping to increase profitably for as little as a few thousand dollars, more and more organizations are using visual management to increase efficiency and profitability.

Implementing Visual Management

Red Lion Controls provides industry-leading solutions for visual management of a wide variety of applications. Red Lion's visual management products range from simple large LED displays to the powerful ProducTVity (PTV) Station. The PTV Station is a ready-to-deploy plant floor visual management system that seamlessly displays real-time KPI data and andon messages on large televisions to drive productivity. To learn more, please visit www.redlion.net/PTV.

The Red Lion Advantage

As the global experts in communication, monitoring and control for industrial automation, Red Lion has been delivering innovative solutions to customers for forty years. Our award-winning technology enables companies worldwide to gain real-time data visibility that drives productivity. Product brands include Red Lion, Sixnet and N-Tron. With headquarters in York, Pennsylvania, the company has offices across the Americas, Asia-Pacific and Europe. For more information, please visit www.redlion.net or call +1 (717) 767-6511. Red Lion is a Spectris company.

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