Digital Signage for Manufacturing

A LamasaTech Whitepaper
Introduction

Digital Signage for manufacturing is probably the least understood and talked about of all the display technology applications. However, when it comes to applications that yield qualitative benefits, Digital Signage can display critical production line alerts and metrics, streamline communications and reinforce safety information that make it an instrumental resource for any modern operation.

Modern manufacturing often involves lean manufacturing initiatives, which digital signage can address with production data and metrics integration. Digital signage often supports “set it and forget it” programming, so floor managers can spend more time on the floor accompanying their plant workers, which has a tendency to boost morale and promote teamwork. With digital signage on the production floor, displays easily communicate reliable and timely production information, such as quality control, up-to-the-minute production totals, inventory levels and assembly line alerts.

For manufacturers that employ process development initiatives (such as lean, six sigma, kaizen etc.), digital signage is an asset. It can increase worker safety awareness, improve plant communications, alert workers to supply-chain concerns and help reduce response time for production quality issues, more so than less-agile communication methods. It can also eliminate or greatly reduce print publishing that will help eliminate waste, too.

Creating a Return on Investment with Digital Signage is typically accomplished through a positive impact on sales, improved customer experience, brand reinforcement and the like. But when it comes to manufacturing, ROI is often first realised with an improvement in safety. The cost savings of a safer work environment is huge, especially considering that just one injury costs an organisation £21,000 (source: HSE Cost Model 2012) on average. This is where digital signage can shine in manufacturing, considering how well and easily it accomplishes repetitive and engaging communications that include safety reminders and alerts.

Company communication is also a major challenge on the plant floor. Considering that 40% of workers don’t have access to email, plants often rely on word-of-mouth and bulletin boards to get their message across. This is not very effective or efficient. Digital signage placed away from the production floor where workers take breaks, socialise and eat has proven to effectively communicate company updates, reminders and messages. Employee contests and event highlights can be broadcast to increase worker morale, supporting overall the team atmosphere that foremen work so hard to achieve.

Imagine an industrial plant where management wants to communicate vital information to hundreds of workers. Perhaps it’s production quotas vs. actual performance; perhaps it’s mean time between accidental employee injuries; perhaps it’s delivery information regarding vital components that are en route. In all of these instances - and others too numerous to recount here - digital signage has the ability to convey to a workforce important information that is vital to employees maintaining a safe, efficient environment.
Technology that works

The most important feature of a Digital Signage system is for it to work in its designated environment. Whether installed above production lines for metrics and KPIs (Key Performance Indicators), inside a distribution centre or outdoors in the loading bay, the Digital Signage hardware needs to do its job. Failed technology can cause a loss of production and profits, while internal communications and health & safety practices suffer through lack of readily available information.

It is imperative to consider how to keep this technology protected, so your messages can continue to be displayed without lost time due to accidents or preventable malfunction. There are numerous environmental conditions that exist in today's factories that can raise concern, such as temperature, moisture and airborne particles (dust, aerosols, smoke and fumes).

To negate the risks of hardware failure, and ultimately the loss of production, performance, communications and health & safety practices, we only provide solutions that are rigorously tried and tested in the harshest environments and that are guaranteed to extend the longevity of your technology. Failure is not an option.
Communication is critical

Communication is critical in any working environment. There is a plethora of communication tools that can be used to dispense pertinent data to the workforce; scheduled meetings, mobile phones, emails, newsletters, two-way radios, and PA systems are all examples. The combination of these methods cause wasted time and allow for delays or miscommunication of information. Since good communication creates a level of accountability, trust and confidence, an adequate improvement strategy must include ways to simplify and streamline the communication channels.

"You can't expect to meet the challenges of today with yesterday's tools and expect to be in business tomorrow."

Using Digital Signage Displays to broadcast a wide range of data direct to the workforce is a hallmark of lean enterprises. Displays can show control charts and various production metrics, provide team and shift communications and other vital information that must be shared between management and employees (such as training and health & safety notices), as well as various departments and individuals throughout one or more facilities.

Communicating this way provides employees with a keen awareness of expectations while contrasting this with actual performance, all in real-time. This can alert employees as well as management to trends and potential problems much sooner than current communication methods.

By placing your Digital Signage Displays in strategic locations throughout high-traffic areas, employees are instantaneously notified of new work orders or tasks and can immediately see which priority these have been assigned. Also, they can see which work assignments are currently being addressed and which are finished. It is this kind of communication that eliminates time wasted waiting on verbal orders or getting questions answered by traditional means of communications.

Management has the luxury of seeing instantaneous production line activity like never before. Detailed, real-time metrics and KPIs are visualised and controlled, while the ability to disperse emergency alerts throughout the site proves an invaluable feature. New work orders can be scheduled, inventory requests can
placed and the entire system can be managed using a mobile phone, tablet or laptop from anywhere, thus simplifying communications overall. Gone are the tiring tasks of continually moving back and forth from the floor to a desktop computer, using only basic and unreliable means of verbal or written communication to interact with personnel.

Benefits to a Communications Strategy

- Reduction of operation costs by lowering the number of methods used to relay messages.

- Increase of productivity through real-time access to pertinent information. This allows employees to spend more time on the task at hand rather than on attempts to locate people in order to obtain needed information.

- Increase in overall operations productivity by streamlining overall communications.

- Better decision-making with communications based on real-time data, linked through data collection methods and allowing prompt responses to changing conditions in production.

- Enhanced data security by increased control over the flow of information.

- Reduction of on-going equipment and materials costs by eliminating outdated and no-longer required methods of communication.

Digital Signage Displays can be used in various environments around your site. Besides displaying information on the production floor, they can be used to display information specific to such departments as quality control & HSEQ, lounge and canteen areas, plant operations, logistics, warehousing, purchasing and inventory.
Health & Safety

The future of Health & Safety initiatives is here. Digital Signage will engage and enhance an effective strategy for negating incidents, accidents, disease, health issues and lost-time, while creating a proactive, compliant and financially viable workplace.

Organisations of all sizes are saving significant amounts of money by taking a more proactive approach. Cost savings include, but are not limited to: legal costs, insurance premiums, damaged property, recruitment costs and sick pay.

As reported by the Institution of Occupational Safety and Health (2014), "Across the world, two million people die every year as a result of health and safety failures". Health and Safety is an issue that businesses worldwide simply cannot ignore. Effective Health and Safety policies not only protect the wellbeing of an organisation's workforce and business continuity, but also present significant financial opportunities. For example, E.ON have saved nearly £12 million in a single year, Rolls-Royce saved around £11 million in just three years and chilled foods producer Uniq saved over £100,000 over three years.

The global financial impact was estimated by the International Labour organisation (ILO), "4% of the world's Gross Domestic Product (GDP) is lost due to accidents and work-related diseases."

Digital Signage provides the ideal platform from which Health & Safety communications can be disseminated to an organisation's workforce. In a few seconds it can accomplish something that traditional signage often fails to do; engage busy employees and instil concise visual information.

Well-implemented Digital Signage proves far more captivating than written communication, such as noticeboards, paper signage and email, and helps ensure your message gets across. Digital Signage is the ideal enabling technology to help embed Health & Safety strategies, and can be used as a primary training medium or to consolidate other learning e.g. classroom or external-based training.
Emergency & Evacuation

Central to any emergency plan is the ability to broadcast accurate and helpful info to the workforce and public fast - and in the most attention-getting way possible - particularly in large production areas or across a multi-building site.

Digital signage is just the tool for this. You can issue evacuation orders and other emergency procedures in great detail with easy-to-follow arrows and icons, as well as clear audio instructions. Details can be streamed system wide with the push of a button, even from a remote location, and content can be updated quickly even changes occur.

Emergency messaging through digital signage helps you protect those you're responsible for. Communication is a vital part in keeping guests, visitors and staff safe during difficult times. Help them efficiently find shelter, locate the quickest escape route, and stay informed. Most importantly, the information you provide will help to keep everyone calm during any emergency situation.

Once your emergency messaging system is put into place, our digital signage solution helps you maintain and update the messages very easily. Knowing that you'll be able to calmly instruct staff and property guests when an emergency arises is a peace of mind commodity that you cannot do without.
Develop your Data

Getting the most out of your metrics

Are you harnessing the true power of all the manufacturing metrics gathered in your facilities? How can you make that data actually work for you? It is a complex problem, but the answer is simple; data development.

By developing your data and by streamlining the number of metrics recorded and fed into a Digital Signage solution, you can create a targeted, reliable and manageable system which is can be both scalable and autonomous.

There are numerous benefits for implementing an autonomous system – the biggest being the saving on labour, however, it also helps to save energy and materials, and to improve quality, accuracy and precision. Combined with a targeted strategy, to ensure the displays are positioned in the most concerning areas and visualise only precise, necessary information, Digital Signage becomes one of the most important tools in manufacturing.

It has been common for metrics to be displayed on Whiteboards or even LED Scoreboards; of which, are either manual or extremely limited in their use. Automating this communication process with a targeted and scalable solution is key.

Automatically pulling data and displaying key metrics in real-time is extremely powerful. In a thesis titled ‘Metrics: You Are What You Measure!’ by John R. Hauser and Gerald M. Katz, it states that those “...who know how to maximise [their metrics] fear to change course. It is extremely hard to refocus the enterprise on new goals.”

This can be seen in many organisations that utilise Digital Signage to relay metrics. As an example, workers can see how small improvements to aspects of their workflow creates a substantial improvement to the manufacturing metrics visualised on the Digital Signage Displays.

Once this happens, as was written by John R. Hauser and Gerald M. Katz, it's incredibly difficult to move away from the productivity mind set. Having the individual and team efforts displayed as real-time metrics is gratifying and rewarding for the workers. Behind the scenes, those metrics just so happened to be hand-selected by management as the key areas for improvement.
Manually publishing manufacturing metrics to workers is extremely time consuming and could result in hundreds, if not thousands of hours wasted. Implementing Digital Signage, and vastly enhancing it with our Data Development solutions, will not only provide the benefits of having a common cause, but will naturally Lean up the workflows.

With the application of displays on the plant floor, employee common areas, and even metric displays in the executive offices, a new layer of process measurement can be implemented. The key is to utilise the capabilities of your Digital Signage to pull crucial data from existing MRP, ERP or MES systems, Excel sheets, recorded OEE data, SQL databases or anywhere else that your organisation performs manufacturing data collection and analysis.

**Lean Strategy**

Within all working environments, wasteful activities are abounding in many areas, including communications. Although communication is not usually considered an area that causes waste, excellence in communications should be a serious concern. Current methods of communicating, such as PA systems, two-way radios, printed reports and lengthy meetings can consume valuable resources, such as time and productivity. Talk is not cheap in these instances.

Adopting a lean strategy for your communication practices ensures time and productivity is paramount, while addressing methods of delivering pertinent information when and where it's needed in a reliable and efficient manner. This can have staggering effects and is why lean strategy is worthy of serious consideration by operations and productions directors, quality and HSEQ managers, inventory and logistics managers and maintenance teams.
What is Lean Strategy?

Lean strategy, according to Dr. Shigeo Shingo and Taiichi Ohno, the founders of Lean Manufacturing, is a process of that focuses on eliminating and removing the “Seven Deadly Wastes”. These include:

1. Overproduction: making something before it is actually needed.
2. Waiting: Time when work-in-process is waiting for the next in production.
3. Transport: Unnecessary movement of raw materials or finished good.
4. Motion: Unnecessary movement of people.
5. Over Processing: More processing than is needed to produce product.
6. Inventory: Product quantities go beyond supporting the need.
7. Defects: Production that is scrap.

How do Digital Signage Displays address the Seven Deadly Wastes? By streamlining operations with clear and precise visuals which provide vital information, correct data and metrics, performance and productivity indicators, all in real-time and exactly where it’s needed.

Eliminate Overproduction

Digital Signage Displays allow employees to pace production so rates coincide with customer demand. Too much product means monetary loss. With dynamic visual data in production areas linked to a manager's office, it becomes a simple task to identify trends and intervene to keep product flow on track, thus preventing overproduction and loss of product. Managers can then use a pull system to control how much product is manufactured or reduce batches of product as needed.

Eliminate Waiting

Are production goals being met? Orders being filled on time? What lines are down and how long have they been down? It can be quite a surprise to look at the time from order to shipment and see how much of that time has truly been spent on value-added manufacturing. With Digital Signage Displays, this information is easily displayed and evaluated, work orders issued, alerts broadcast and achievements of goals recognised.
Such information also allows managers to streamline work orders. Work orders are traditionally issued through clunky communication methods; such as two-radios, typing, printing, delivering work orders, or verbally relaying orders. Since they are integrated to pull from existing databases, our real-time Digital Signage solution can reflect up-to-the-minute changes, such as work orders assigned and work orders finished. This helps eliminate redundancy and waiting time involved in collected data and creating reports. The effect is a reduction of time spent discussing and improving on past deficiencies or occurring trends, as this information is now readily available and can be seen by all on the displays at any given time.

**Eliminate Transporting Deficiencies**

Using Digital Signage Displays in the warehousing and logistics departments allows for greater flexibility in inventory control and transporting of product. It eliminates changes in product flow and assures work-in-process is not placed in inventory, while automating the sequential flow of finished goods.

Constantly storing and moving stock can become a burden, especially with degradable products. Digital Signage Displays allow real-time communications with inventory and logistics personnel to identify trends and intervene to keep product flow on track. This ensures the right amount of stock is kept and correctly located for timely dispatch.

**Eliminate Motion**

By strategically placing Digital Signage Displays and ensuring only relevant content is shown in specific areas, employees are provided with a stream of continual and targeted information. In this instance, work can be logically organised so as to reduce motion and create more productivity.

**Eliminate Over Processing**

Often a more difficult waste to detect and eliminate, over processing is simply where more processing than is needed is put into a product. Having current trends and metrics available at all times throughout a plant keeps managers and employees informed of occurrences that are leading to over processing, assist in identifying these trends and allow them to be reduced or eliminated altogether.
**Eliminate Inventory Discrepancies**

Lack of or too much inventory can be devastating for manufacturers. The sooner employees are aware of a discrepancy; the sooner the problem can be addressed. With real-time data displays, production goals are broadcast, upcoming production schedules changed and information is communicated from a central location and made immediately visible to employees. Once production levels are reached, lines can compensate to avoid unnecessary production, thus maintaining appropriate inventory levels.

**Eliminate Defects**

Scrap product or product that requires reworking means monetary loss for manufacturing companies. But with easy access to inventory, production and maintenance schedules, managers can adjust raw materials as needed, reduce or entirely eliminate steps in production, or enforce overproduction countermeasures.

Keeping a close eye on manufacturing processes and the resulting products and inventory allows for improved design of processes, so that defects can be more easily identified or immediately corrected. Work instructions or work orders can then be immediately issued to reverse any adverse production.

**Conclusion**

The true value of lean strategy in manufacturing is seen when all operations or departments are linked through reliable, up-to-date information that is streamlined through use of integrated and dynamic data. With technology in manufacturing, such as Digital Signage Displays, relative information shared throughout the manufacturing facility or facilities from a central point can be shared with the entire site and beyond to various departments. This allows operation, production, maintenance, quality control and logistics to function seamlessly and to make constant improvements that eliminate the Seven Deadly Wastes in Lean Manufacturing.
Lean Six Sigma - Is There a New Methodology?

When determining the methodology that is best suited for the Lean Six Sigma project at your organization, one must consider; can there be a way to improve upon the methodology itself?

Why are methodologies used in a Lean Six Sigma project?

The fundamental objective of the Six Sigma methodology is the implementation of a measurement-based strategy that focuses on process improvement and variation reduction through the application of Six Sigma improvement projects.

Since measurement strategy is one of the foundations in which Lean Six Sigma rests, we must ask ourselves, is there more that can be done when going through the measurement and analysis processes?

The Define, Measure, Analyse, Improve and Control (DMAIC), and Define, Measure, Analyse, Design and Verify (DMADV) are the two Six Sigma methodology processes which encompass the progression of manufacturing projects.

By displaying the progress of the project, so as to have instant feedback for the teams involved, you’re contributing to the improvement, control and verification processes. Project completion results and crucial task information can also be displayed to communicate success and targets alike across the workforce.

While the benefits are obvious, how would this work?

After the Six Sigma project has been chosen and a Business Research Document (BRD) has been created, it is time to start the DMAIC or DMADV process. While doing this, it is crucial that the project metrics and Key Performance Indicators (KPI) are recorded in a way that analysis can be achieved. Real-time monitoring of these KPIs can add a new dimension to the process in the DMAIC and even the DMADV methodologies. This begins to form a new methodology based on DMDAIC (Define, Measure, Display, Analyse, Improve, and Control) and DMDADV (Define, Measure, Display, Analyse, Design, and Verify).
How do I display my Lean Six Sigma metrics?

While the KPIs and the other Lean Six Sigma metrics are being recorded in a database (Excel spreadsheet, SQL database, text file or other ODBC databases), a data-driven Digital Signage solution can automatically pull from a database or collection of databases, format the information into graphs, charts or tables, and then present the metrics that are needed during the DMAIC/DMADV process. This enables those in the Six Sigma project to capture real-time information so that they can take action.

The key is to make this an automated process so that all efforts are focused on increasing productivity, while decreasing defects within the project. In order to accomplish this, Digital Signage platform must be combined with a Data Development solution that is capable of pulling and filtering masses of information.

What Gets Measured Gets Done

Charles M. Schwab (1862-1939), an American steel tycoon, led Bethlehem Steel to become one of the largest steel makers in the United States. He was also a skilled motivator making use of manufacturing technology that was way ahead of his time.

Charles M. Schwab liked to tell the story of one of his mill managers whose people weren't producing their quota of work. While visiting the mill one day, Schwab asked the manager for a piece of chalk, then, turning to the nearest man, asked: "How many heats did your shift make today?" He said, "Six."

Without another word, Schwab chalked a big figure six on the floor, and walked away. When the night shift came in, they saw the "6" and asked what it meant. "The big boss was in here today," the day shift people said. "He asked us how many heats we made, and we told him six. He chalked it down on the floor."

The next morning Schwab walked through the mill again. The night shift had rubbed out "6" and replaced it with a big "7."

When the day shift reported for work the next morning, they saw a big "7" chalked on the floor. The crew pitched in with enthusiasm, and when they finished that night, they left behind them an enormous, swaggering "10."
Thus a fine competition was started and shortly this mill, which had been lagging way behind in production, was turning out more work than any other mill in the plant.

Schwab's history-changing "6" proves an invaluable point - informed employees work better and harder.

This story insightfully illustrates the old maxim ‘What gets measured gets done’. In this turn-of-the-century account, and throughout history, production data has been recorded and analysed for the purpose of improving efficiency. Employing manufacturing technology to display current production metrics keeps employees motivated and keenly aware of all company goals at any given time, creating a healthy, spirited competition.
Manufacturing Technology Today

Today you may not be writing your production metrics on the floor, but perhaps you are using similar manual methods such as writing them on a white board, typing them into a spreadsheet or text file, or manually collecting data from different sources to analyse. In support of lean and six sigma strategies, maybe you’ve utilised current manufacturing technology and stepped into the world-class realm of using ERP, MRP or MES systems to monitor, log and analyse all of your data, thus removing most human intervention.

However you collect and save your company’s most important data, you can see the importance of sharing that information with your people - automatically, quickly, accurately, consistently and reliably. Only then can you understand the cause and effects of problematic performance as well as successes, and take action to ramp up production and drive business improvement. What gets measured does get done with the right metrics initiative.

Digital Signage Displays from LamasaTech can lift employees and production to a new level. By communicating directly with your existing databases (or other multiple sources) and displaying it on strategically located screens, LamasaTech’s Digital Signage Solutions provide your employees and floor managers with consistent and accurate information to drive improvement and morale when it's needed.

Through implementing Digital Signage as a communication tool, internal processes between departments will be streamlined. Health & Safety is also a huge improvement area, with targeted messages, HSE notices and reminders being delivered as and when they're required to specific locations across the site. Link in with an emergency system to create a fully-fledged evacuation solution which proves invaluable for relaying immediate information and directions to everyone involved in a critical scenario.
Return on Investment

There is a universal case for returning profit through investment in a Digital Signage and Data Development solution, as each use will provide a form of ROI. By segregating the different uses to show the potential for ROI, it's clear how implementing such a solution will prove both massively beneficial and financially viable:

Communications

- Reduction of operation costs by lowering the number of methods used to relay messages.
- Increase of productivity through real-time access to pertinent information.
- Eliminates time wasted waiting on verbal orders or getting questions answered.
- No printed material is necessary, saving both time-spent and costs on materials.

Health & Safety

- Mitigate unplanned employee absence which affects productivity
- Reduce legal costs, fines, insurance premiums and compensation claims
- Reduce sick pay, staff cover, recruitment and training costs
- Minimise downtime and production losses (including contract penalties)
- Stop property and equipment damage
Process Improvement

- Lean improvements:
  - Eliminate Overproduction
  - Eliminate Waiting
  - Eliminate Transporting Deficiencies
  - Eliminate Motion
  - Eliminate Over Processing
  - Eliminate Inventory Discrepancies
  - Eliminate Defects

- Consistent and accurate information delivered to drive improvement and morale

- Negate chance of potential penalties where Service Level Agreements (SLAs) are not met

- Automated process so that all efforts are focused on increasing productivity

- Reduction of on-going equipment and materials costs

- Streamlined processes to reduce time-spent and overheads