

# THE VISUAL PHARMACEUTICAL WORKPLACE

Imagine a highway system without signs and you'll understand why so many drug manufacturing facilities fail to reach their potential. Visuality is key to achieving operational excellence.

By Gwendolyn Galsworth, President, Quality Methods International, Inc.

**ESTABLISHING** a "visual" workplace, where information is immediately accessible and part of the work process, is the foundation for improving efficiency at any manufacturing facility. At too many GxP-compliant pharmaceutical plants, operators, mechanics, scientists and engineers waste hours each day looking for documentation, locating spare parts, tools or the right labels, moving from one part of the floor to another, or running error-prone equipment or processes.


The result? Longer changeovers, wasted time and rework, all of which can add up to millions of dollars in losses each year. You may already be familiar with 5S (Box) and Error Prevention, which are key parts of any Visual methodology. However, the Visual workplace goes far beyond these tool sets by establishing a culture of openness, alignment and transparency even as it attacks errors and error-causing conditions.

This article will outline the requirements of a Visual workplace that will help you get started on developing a Visual work culture wherever you work, whether on a pharmaceutical production floor or packaging line, or in a quality control laboratory.

## THE ROAD TO EXCELLENCE

In a truly effective workplace, information is so thoroughly infused into the environment that it has become an integral part of the work process. Consider any advanced highway system. At every step of the way, visual information keeps the system functioning, helping drivers do the right thing, at the right time, in the right way, safely. And yet, drivers rarely give thought to this rich array of visual devices, because the information has "become" the system. The fact that we take these visual systems for granted is proof that they work.

A Visual workplace speaks to its workforce continually, telling employees how and

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## A 5S PRIMER

5S has typically been translated from Japanese as follows: Sort (*Seiri*), Set in order (*Seiton*), Shine (*Seiso*), Standardize (*Seiketsu*) and Sustain (*Shitsuke*). A more helpful definition might be as shown below:

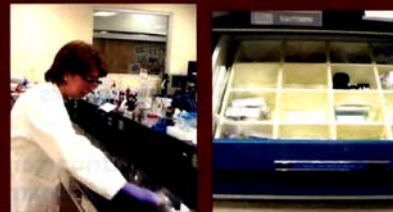
S1: Sort Through—Get rid of the junk

S2: Shine—Make it clean (and look for ways of preventing dirt)

S3: Secure Safety—Make it safe (and look for ways to prevent risk)

S4: Select Locations—Implement smart placement based on an accelerated flow

S5: Set locations—Install automatic recoil (the visual where) through borders, home addresses, and ID labels



# VISUALITY AT J&J'S PSGA MANATI

An Operations Excellence Leader and Master Black Belt describes how Visual methods are transforming her site and its teams

By Giselle Rodriguez, Operations Excellence Leader, J&J PSGA, Manati, Puerto Rico



**THROUGH** its Process Excellence program, J&J established a foundation for operational excellence, globally and throughout the corporation, with roots in Visuality and Lean principles. Each site implements its own strategy, based on unique plant needs, using 5S, error-proofing, and OEE (overall equipment effectiveness) concepts, as well as Lean and Six Sigma methodologies. We began our Lean program at Manati in 1999; like other J&J facilities, our goal is to get as close as we can to true "pull" manufacturing.

On the floor, we typically implement 5S (Box, p. 14) first, because the process makes it so much easier to highlight other problems. We start these initiatives from back to front, beginning with packaging lines, then working through manufacturing. Now that we have implemented 5S at our manufacturing facilities, we're rolling it out at our laboratories. Once this process is complete, we'll go on to Value Stream Mapping (VSM). But the first, essential step is getting everyone excited about establishing a Visual workplace through 5S.

The key to succeeding with 5S and Visual principles is realizing that they cannot be implemented everywhere, or overnight. It's critical to determine how much can be done without interrupting the normal work flow, so the first step is defining what's important for the business and identifying the critical work centers that would benefit most from the efforts. It's best to move slowly, with one or two projects. People involved in these projects will create an atmosphere of change and excitement that is contagious, and will quickly spread throughout the organization.

It took roughly three years to develop an overall Visual and Lean strategy at Manati. It's important to realize that, in order to succeed, leadership and training are required, and training will have to cover all aspects of the program, from forming teams to developing checklists and a format for recording training, all of which take time.

Implementation also takes time and resources. Any 5S program will require funding for overtime, and managers have to learn to be quiet and truly listen to operations staff. They can't simply dictate or impose what they want done. Picking the right battles is critical. If I want green and the operations staff wants yellow, I'll usually let them have yellow. Consistency is key.

At J&J, we've built a culture where we insist that people not simply accept something "because I say so." If I come up with a suggestion and anyone on the floor disagrees, they have to explain why. And I have to listen. If they make their point coherently, I have to admit when they're right.

## PATIENCE THE KEY

The full impact of 5S isn't always visible immediately, which may be why some companies have resisted it, or abandoned their efforts mid-stream. But given time, 5S changes the entire tone of the workplace so that people just feel better about coming to work.

Starting with the first S, "Set in Order," is best. The work area will look better and be easier to clean. It also strengthens the impression of compliance, conveying a message that the workforce has control over its area. Other issues then begin to fall into place.

For 5S, we let employees come up with their own ideas. They worked on Saturdays to do this, buying the materials and building the solutions themselves. In one case, spare parts had been stored in a common cabinet, so that operators or mechanics had to search, drawer by drawer and part by part, for what they needed. Now there's a box containing all the change parts, and each part is placed on its own "form," molded to conform to the exact shape of that part, in its own labeled drawer.



J&J's staff at Manati are implementing 5S, OEE and Kaizen approaches, with great success

With the forms, if the part's missing, it's obvious right away, while the wrong tool won't fit in the wrong mold. Also, instead of putting tools "straight" into these forms, they've been placed at a 20- to 30-degree angle so that they can be removed easily. These steps may not sound like much, individually, but they add up to significant time savings.

#### INTEGRATION

Of course, as the Visual work progresses, and 5S and other Visual programs are integrated with Lean, DMAIC and OEE, hard data will allow success to be monitored. Output will also increase, as unnecessary motion around work areas is minimized. But even before that, positive change is usually seen in workers' faces, which are more relaxed and reflect a less stressful work environment.

We've developed a training module for everyone involved in our 5S programs, including a radar chart that measures each person's success. People monitor themselves, and the entire team continuously reports results.

Once a 5S program is well established for a specific line undergoing Lean, we move on to VSM, to identify opportunities for improvement. A cross-functional group of stakeholders examines the process and identifies opportunities for improvement, which are written down and placed in a "job jar." They are then prioritized using a matrix that ranks suggestions based on their potential impact and how easy they are to implement.

A recent job was to develop visuals for Lean. We developed schedule boards to track projects and installed them at different lines so that operators could provide input. We left the board there for one week, gathered comments, then analyzed them based on 5S, VSM and Visual Factory methods. Now, for any project, we have a storyboard that keeps everyone up-to-date on progress.

Once we've prioritized changes and "action items," we go back a second time and validate the top-ranking initiatives to ensure we've selected the right ones. At this point, we make assignments and allocate resources. Some projects are engineering projects, while others are normal improvement projects and assigned to certified Belts or candidates for certification.

#### KAIZEN TEAMS START THE PROCESS

We use Kaizen teams on all critical lines, particularly those that make high-volume products. Typically, they create the teams that start the 5S process. Members stay on the same Kaizen teams for three months to one year, then move on, which is critical to sharpening their skills. These teams attend to the day to day, and provide feedback on OEE, develop Paretos and evaluate changeover, quality and downtime issues. We have a weekly one-hour meeting to address issues. If a problem has a quick fix, we go ahead and make it.

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when to use it properly, alerting them to where tools and materials are, at a glance, and warning them when processes are off-track. Because it explains itself, a Visual workplace engages the work force, which makes the workplace self correcting. Visual organization reduces stress in the workplace, and empowers people who work there to be more "in control" of their work processes.

#### THE BUILDING BLOCKS OF VISUAL THINKING

Visual thinking is each employee's ability to notice his or her own motion and the information deficits that trigger it, and eliminate both. Eight building blocks must be in place for this outcome to result.


1. **The ability to find answers to "information deficits"** that are vital to accurate, complete and safe work. Seeking those missing answers can consume much of the work day.

2. **Asking six core questions: Where, What, When, Who (or which machine, tool or person), How many, and How?** Workplace Visuality installs answers into the work environment in the form of Visual devices and mini-systems.

3. **An understanding of motion**, the chain of negative events that leads to "moving without working".

4. **A clear understanding of work**, which may be defined as "moving and adding value"—or engaging in value-enhancing activity.

Whereas work adds value, motion reduces it, blocks it or makes it impossible. Let's say, for example, you need a spare part for the case packing machine, so you walk to the stockroom and look through several cabinets in order to find it. All three of these activities are examples of motion—two of them can probably be eliminated through Visual devices, and the third (the need for the spare part) can probably be reduced as well.

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We audit the teams to ensure that they're following guidelines and to ensure consistency. *Kaizen* leaders report to cross-functional Performance Evaluation Teams (PET) at regular meetings. The PET teams assess progress and provide input, allowing us to capture gains and recognize team members.

Our top priority is always empowering people. All operators have the opportunity to be certified for Lean. If they wish to be certified, we pick a test project and assign it to them, then monitor progress monthly. An experienced coach guides the candidate through implementation. Each month, the novice Lean practitioner makes a presentation to staff and managers, and both groups give opinions as to whether goals were met. At the end of the project, if goals are met, that person is certified, and then eligible to pursue a Green or Black Belt.

Staff were recently surveyed on training needs, and some felt that they needed to polish their English skills, so we hired English coaches for them. Others want training in Excel and PowerPoint, to improve their presentation skills.

When I cannot attend a PET meeting, I'll hear about it later from operators. This is exactly the kind of empowered culture that we want to create, and Visual methods have helped us reach this point.

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**5. A motion metric that shows how much time you spend away from your value field, or the location where value is added.**

Start collecting data. Get a stopwatch or pedometer and track time and distance. You're in for a surprise. At the end of the day, have you racked up an hour away from your value field—or is it 2.5 hours?

**6. Answers to the two unanswered questions for every process or procedure:**

- **What do I need to know?** What information do I need in order to do my work?
- **What do I need to share?** What information do I have for others to do their work?

**7. Creating an I-driven environment.** Notice that the two basic questions are anchored in "I" rather than "we." The Visual workplace links each individual with his or her own information deficits and therefore puts him or her in charge of creating a Visual answer to them.

Once 1 through 7 are in place, you can move on to

**8. Establishing technical standards** (specifications, values, dimensions) and the step-by-step process by which they are achieved—standard operating procedures, or SOPs.

In a workforce of Visual thinkers, people apply these eight building

blocks to invent Visual solutions regularly. When they do, they liberate information that used to be hidden and restricted to just a few. The result over time is an aligned and empowered workforce of continuous improvement.

**A VISUAL BLUEPRINT:  
5S AND BEYOND**

The journey to a fully-functioning Visual workplace crosses no less than

five major levels of Visual information sharing. That process begins with preparing the physical environment to hold Visual information: clearing the clutter, making things clean and safe, and then designating a home for each item left in the area through a home address, and, if applicable, an ID label. In short, this means installing the Visual answer to the "where?" question. This is the work of what is commonly called 5S or workplace organization.

The next step is to implement Visual standards, displays, metrics, problem solving, and controls and pull systems, each a method that creates a given outcome. This system of methods culminates in the most refined Visual application: Visual guarantees or error-proofing, which is imbedding vital information so deeply in the process of work that it becomes the work itself. These *poka-yoke* devices override personal choice, and prevent inadvertent individual error from inhibiting performance excellence.

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A Visual workplace inspires creativity: The "apron" above was the idea of an assembler at Lockheed Martin Aerospace who noticed how frequently he and coworkers could not find tools that they needed. He crafted the big red apron, and added Velcro and color-coding to make storing and locating tools a snap.

## CORPORATE ENEMY NUMBER ONE: MOTION

Motion is often misunderstood. Managers may mislabel as motion some important activities that build community, safety and personal comfort in the workplace. Below are some guidelines for determining what motion is and isn't.

### Motion is:

Searching	Stopping
Wandering	Recounting
Wondering	Asking
Guessing	Answering
Checking	Interrupting
Rechecking	Waiting
Handling	Reworking
Rehandling	Retesting
Counting	

### Motion is not

Taking a break  
Going to lunch  
Calling home  
Going to the restroom  
Chatting with a friend

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### WHAT TO DO?

There is much you can do in your own enterprise to reap the rewards of workplace Visuality.


- Begin a 5S project, only instead of making it primarily about "clean and neat," expand its scope to include Visual information sharing. Go beyond lines and labels. Make a point of challenging people to invent Visual solutions that answer their own need-to-know questions.
- Support "I-driven responses." Make it okay for people to invent things that do not require official sanction.
- Challenge staff to find Visual answers to each of the six core questions. You will notice a new level of excitement and focus.
- Track results. Watch your performance metrics! Introduce a new metric on employee engagement or Visual inventiveness and track that as well.

The learning process will take time. Be sure to factor overtime into your budget, or sanction operator time off for Visual efforts; and think of it as an investment in the future, rather than lost production time.

### WHAT BENEFITS TO EXPECT

An investment in a Visual workplace can pay off in terms of improved throughput at 15% or better; a 30% increase is not uncommon. Just as importantly, people will be riveted on motion

and the information deficits that trigger it. Suddenly, instead of 30 managers being needed for 300 direct employees, 330 employees will be responsible for themselves and for each other. Together, these individuals will spot abnormalities with ease and eliminate them with Visual solutions.

Implemented alone, Visual methodologies can accomplish huge improvements in both day-to-day performance and in strengthening, realigning—or even creating—a culture of systematic improvement. Yet they are best implemented with Lean. Just as a bird needs two wings to fly, a company needs both Visual and Lean if its journey to operational excellence is to be sustainable. 

### About the Author

*Gwendolyn Galsworth, Ph.D. is founder and president of Quality Methods International, Inc. and the Visual-Lean Enterprise Institute. A Baldrige and Shingo prize examiner, she has been implementing, researching, and codifying the field of workplace Visuality for nearly 25 years. Dr. Galsworth is author of four books on the Visual approach, including her most recent, "Visual Workplace/Visual Thinking: Creating Enterprise Excellence through the Technologies of the Visual Workplace" (Visual-Lean Enterprise Press, 2005). The Visual-Lean Enterprise Institute, opening in January 2006, will train, license and certify companies in these technologies. More information can be found at [www.visualworkplace.com](http://www.visualworkplace.com).*