

# 6S and Visual Management

By Maurice O'Brien



## About LBSPartners

LBSPartners was founded in Limerick in 2002 to educate and assist companies in the development of operational excellence through Lean, Lean-Sigma & 6-Sigma.

We are a hands-on business improvement consulting firm with extensive Lean and management experience. Our customer base includes SMEs, Multinationals and Public Sector clients in food, engineering, life sciences, services and software.

LBSPartners has a proven track record of delivering measurable and sustainable results to our clients through significant Lean transformations to hundreds of clients. Projects typically deliver improvements in cost, quality and customer service.

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# 6S and Visual Management

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# 6S and Visual Management

## What is 6S?

The 6S process is a series of steps and procedures which are used to arrange work areas in the best manner to enhance performance, safety and cleanliness.

### Features of 6S

- 6S provides a solid base for all process improvement activity
- It represents the first step on the Visual Management ladder
- It places work-teams in control of their own areas
- It helps focus on causes and elimination of waste
- It helps establish standards of storage, housekeeping and visual communication

# 6S and Visual Management

6S is an acronym for 6 words which describe the methodology for developing the basis of process improvements.



Figure 1 The 6S Methodology

# 6S and Visual Management

## What's the purpose of 6S?

The main purpose of 6S is to drive cultural change within the organisation; to begin the cultural shift within an organisation to one of continuous improvement.

6S is concerned with behaviour; successful 6S is concerned with changing behaviours.

Specifically, implementation of a successful 6S program serves the following purposes:

- To introduce structured process improvement
- To build knowledge, capability and commitment, empowering employees in the process
- To provide management with a process that allows them to confidently allow employees to solve problems

## Benefits of 6S

- Increases productivity, saves time, reduces costs; improves safety, aims to eliminate all kinds of waste.
- Arranges work areas in the best manner to enhance performance, safety and cleanliness.
- Facilitates the early detection of issues or problems – if things look right, they generally are. Once the issues are made obvious, problem solving can begin.

# 6S and Visual Management

## Benefits of 6S

### To the employee

- It provides the opportunity to provide creative input
- The workplace is made Cleaner, Safer and Simpler
- It provides a more pleasant workplace
- It increases job satisfaction
- It results in fewer frustrations in work area
- It improves communication

### To the organisation

- It is the basis for all process improvement
- It improves quality by reducing defects
- It reduces costs by eliminating wastes
- It improves delivery performance by reducing delays
- It allows for reduced injuries, promoting safety
- Supports the implementation of other Lean initiatives such as JIT, TPM, Quick Changeover
- It allows for increasing growth through competitive advantage

## Visual Management

Visual management is defined as a set of techniques for creating a visual workplace, embracing visual communication and control throughout the work environment

### Benefits of Visual Management

- Facilitates employee autonomy
- Serves to eliminate waste
- Fosters continuous improvement
- Allows for quick response & recovery
- Leads to information sharing
- Exposes abnormalities
- Maintains gains

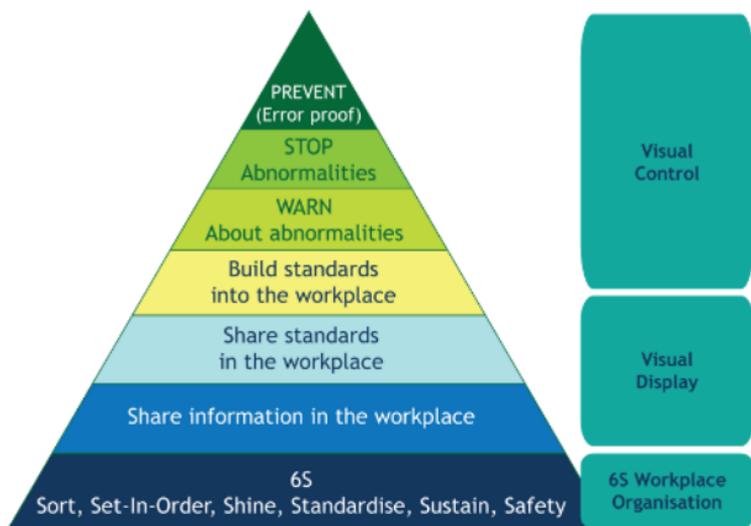
# 6S and Visual Management

## The Visual Management Pyramid

6S/Workplace organisation is at the base of the visual management pyramid.

The next step on the pyramid is Visual display, which involves display of information and standards.

The highest level on the Visual management pyramid is Visual Control, which involves the use of visual signals to monitor and control production.



# 6S and Visual Management

## Visual management - Goals

- The work environment should be spotless, safe and self-cleaning
- Standards should be easy to recognise and abnormal conditions are quickly identified, enabling speedy analysis and resolution
- Performance and progress should be readily apparent to employees
- Mechanisms should be in place to significantly reduce or remove waste and defects in the process

## Visual Display

Visual display involves the exhibition of specific information relating to the running of a work area in that area, for example:

- Team, training matrices etc.
- Standard Work Instructions
- Performance information
- Status of current issues
- Schedules for maintenance, calibration & other support activities
- Product and process information
- Customer requirements information
- Site level display boards

# 6S and Visual Management

## Visual Control

- Visual control is also referred to as “management by sight”.
- It goes beyond just simply tracking and displaying performance information - it serves as a “trigger” for action e.g. based on monitoring hourly production tracking charts, control charts etc.
- Gauges & dials are a form of visual control – they are used to display the current process condition.
- Material can be managed visually by identifying correct locations, quantities, types and Kanbans.
- Methods of visual control include the use of:
  - **Andons** – lights and boards – used to notify an operator of a situation where a process is out-of-control, allowing them to take corrective action.
  - **Poka Yoke (Error Proofing)** – putting measures in place so that a task can only be performed one way, the correct way.

## When Visual Control is properly in place:

- Anything that doesn't belong is obvious.
- Anything that is in the wrong place is obvious.
- Anything that is unsafe is obvious.
- Anything that is out of sequence is obvious.
- Too many or too few is obvious.

## Lean Principles

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### Lean Thinking

Lean thinking focuses on each product/service and its value stream rather than management of firms & assets. The objective of Lean is to enhance value and eliminate waste (muda). The following lean principles define the steps which guide the implementation of Lean across an organisation.



# 6S and Visual Management

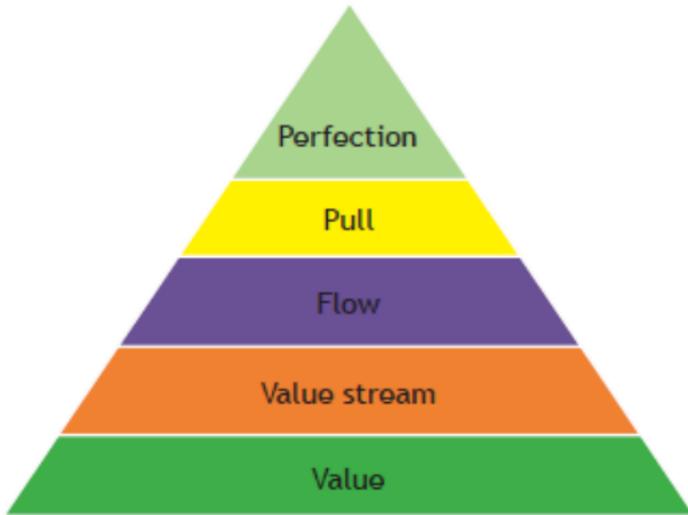


Figure 2 The Lean Principles

## Recognising Value – the 3 attributes of Value:

- Is the end customer willing to pay for it?
- Has some transformation occurred?
- Was it done right the first time?

Value can only be defined by the ultimate customer.

Rethinking value is the key to growth and using freed up people and assets.

# 6S and Visual Management

## The Lean Concept

Lean thinking involves firstly identifying waste and then eliminating it. It considers all activities carried on by an organisation, and sub-divides them into:

- Those which add value to the product or service (Value-adding)
- Those which don't add value but are necessary e.g. legal, certification etc. (Necessary Non-value adding)
- Those which don't add value (Waste)

First identify, then eliminate waste.

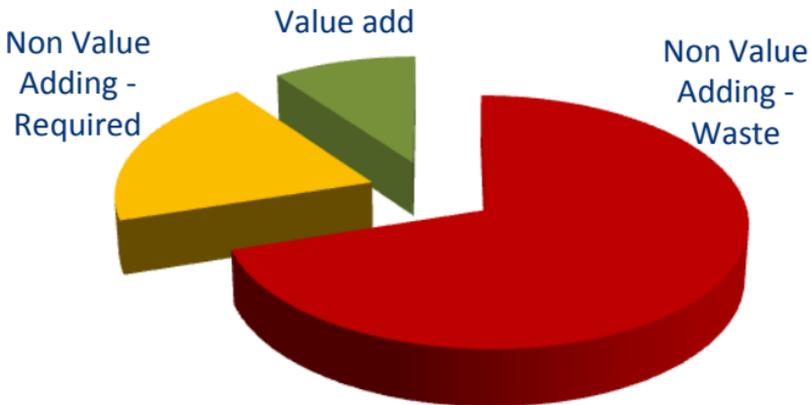


Figure 3 The Lean Concept

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## Value Stream

A Value Stream is the sum of all the activities necessary to create, order and produce a product or provide a service.

The Value Stream should be viewed from the Product perspective. It includes all activities touching the product both value adding and non-value-adding.

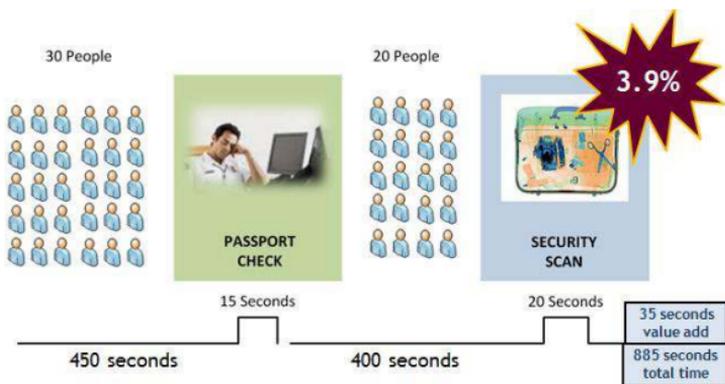


Figure 4 Value Stream Example

In the example above, the total process time is almost 15 minutes (885 seconds), but the time where value is added is only 35 seconds (or only 3.9% of the total time).

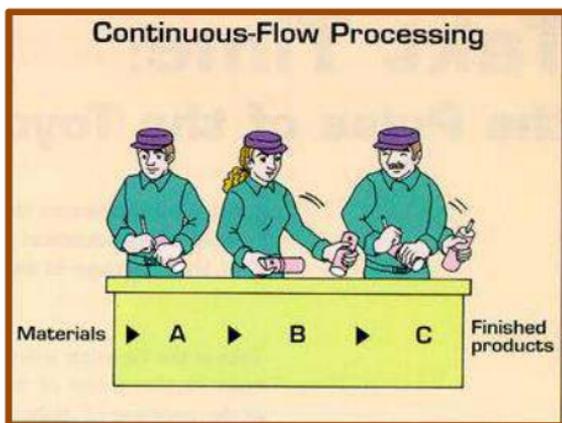
# 6S and Visual Management

Examples of Value-add vs. non-value add activities:

Value adding	Non-value-add-necessary	Non-value-adding
Order entry/management	Regulatory requirements	Waiting
Procurement of raw materials	Obtaining approvals	Sorting
Product design	Reading instructions	Inspecting/checking
Assembly of products	Accounting/payroll	Copying
Shipping finished goods to customers	Recording	Rework

## Flow

Each individual piece of work keeps moving i.e. being continuously worked on with no queues, waiting or rework.



# 6S and Visual Management

## Pull

- No one upstream should produce a Product or Service until the Customer downstream asks for it
- Each activity signals the next activity to begin ('back end' pulls from 'front end')
- Pull needs to take place along the whole Value Stream and therefore requires a sharing of final Customer demand with all tiers of Suppliers.
- Pull reduces time and waste.

## Perfection

- The ultimate objective is perfection - where every action and asset creates value for the end customer
- Most of what we do is waste!
- The more layers of waste you remove the more waste you can see!
- This is not a step change but a path which via a model of Continuous Improvement.

## Lean Wastes

One of the most effective ways to increase a company's profitability is to eliminate waste from its operations. The activities performed by a company either add value or waste to the production of a product or a service. Lean thinking classifies waste under the following categories. To easily remember these wastes, the mnemonic TIM WOODS is used as a prompt.

T	Transport	W	Waiting
I	Inventory	O	Overproduction
M	Motion	O	Overprocessing
		D	Defects
		S	Skills

# 6S and Visual Management



Figure 5 The Lean Wastes

# 6S and Visual Management

## Examples of the Eight Wastes:

Waste	Cause
Transport	Poor layout Poor understanding of the process flow Widely spaced equipment
Inventory	Large safety stocks Unbalanced workloads Unreliable supplier shipments Product complexity
Motion	Double handling Poor layout Inconsistent work methods Poor workplace organisation and housekeeping Keeping busy while waiting
Waiting	Unbalanced workload Unplanned maintenance Long set-up times Upstream quality problems
Overproduction	Unclear goals Excessive lead times
Overprocessing	Customer requirements not clearly defined Lack of communication Product changes without process changes Redundant approvals Extra copies/information
Defects	Weak process control Poor quality Deficient planned maintenance Inadequate training Customer needs not understood
Skills	Culture Little or no investment in training Poor morale

# 6S and Visual Management

## How do we get to a 6S State?

- The involvement of employees at all levels of the organisation is key to a successful 6S implementation.
- Ownership for the 6S programme must come from the top management
- The effort must be applied plant-wide
- All employees must be involved
- The relevant training, communication and understanding must be in place at all levels
- Encouragement must be provided – all employees must resolve not to give up when the programme gets difficult
- Link 6S to the company's survival path
- The following responsibilities must be considered:
  - Participate in implementation
  - Give up the old habits – take up the new
  - Communicate, Communicate, Communicate
  - Maintain the standard through measurement and support
  - Celebrate achievements
  - Be aware of the benefits

# 6S and Visual Management

## Incremental benefit of the 6S steps:

Good is 3S - 6S is Great

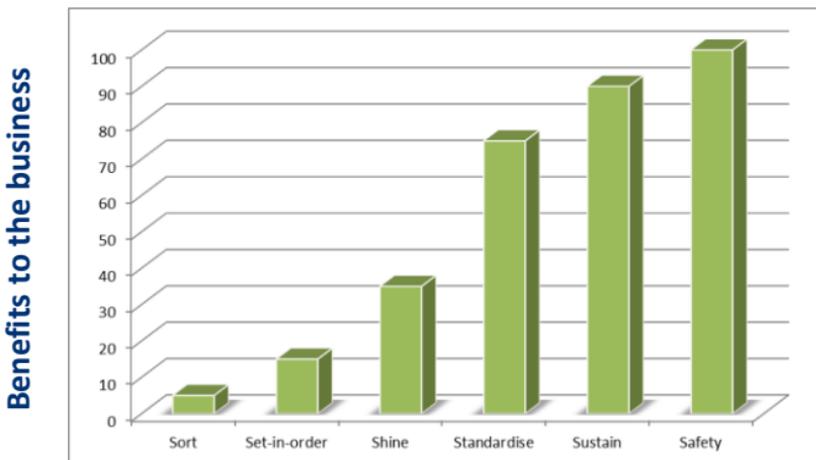
First phase of LEAN introduction

- Conversion of motion to work
- Neat desks have higher productivity
- Neat work areas produce fewer defects
- Neat work areas will meet deadlines better

“We all like to work in a safe, clean environment”

## Is 3S good enough? NO!

As illustrated in the graphic below the full benefit of a 6S program is not accrued until all 6 steps are implemented and sustained.



# 6S and Visual Management

## S1 - SORT

Sort means that you remove from the workplace all items that are not needed for the current operation. Leave only the bare essentials – when in doubt take it out.

### S1 - SORT

**Remove:**

- Excess and obsolete inventory
- Clear out desk drawers, cabinets, shelves
- Toss old e-mail printouts
- Take home personal items
- Broken equipment
- Old and unused tools
- Yesterday's lunch!

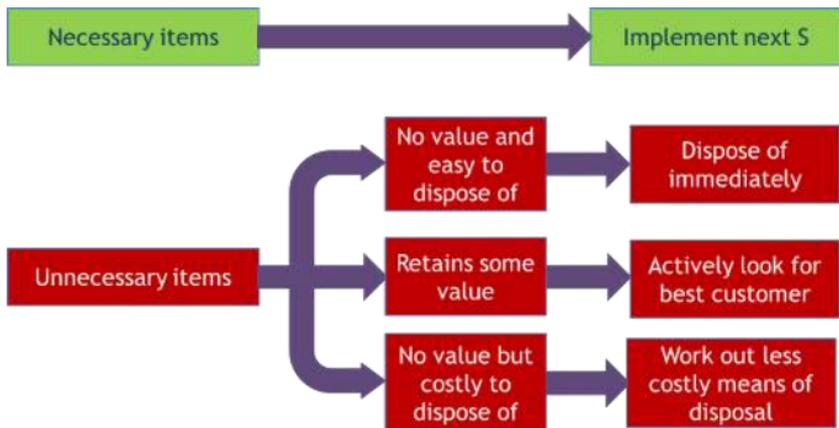
A list is created of those items which are necessary for the work to be performed and the quantities in which they are needed. These items will be organised in the Set-in-order step.

Unnecessary items are removed and disposed of according to their value to the operation.

Items which cannot immediately be classified as necessary or not, are labelled with a red tag and removed to an assigned 'red tag' area to await final disposition.

# 6S and Visual Management

## Implementation steps



### Benefits

- Less frustration - parts & equipment easy to find
- Available space becomes obvious
- Less time wasted looking for tools and materials

### Outcomes

- Cleared area free of all clutter
- Red tagged items for further disposition
- List of necessary tools and parts

# 6S and Visual Management

## S2 – SET-IN-ORDER

Once the Sort step has been completed and the essential items have been identified, a suitable location must be assigned to each item.

- Arrange necessary items in good order so that they are easily accessible
- Everything should be able to be found and retrieved within 30 seconds
- There should be a home for everything and everything should be in its home
- Appropriate labelling should be used, so that anyone can find items and put them away
- The focus is on eliminating “wastes” such as searching, difficulty in using items etc.

Create a home, with visual tools, for all items, and arrange them in line with the physical flow of the work

### Set-in-order toolkit

Motion Mapping (6S maps or Spaghetti Diagrams)

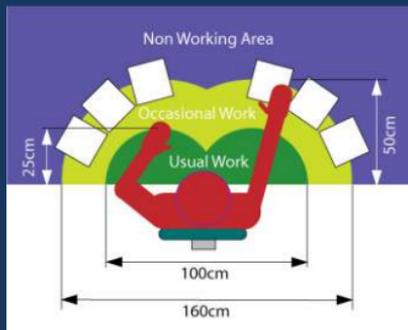
Labelling and Signboards

Floor Taping

Colour Coding

Outlining/Shadowboards

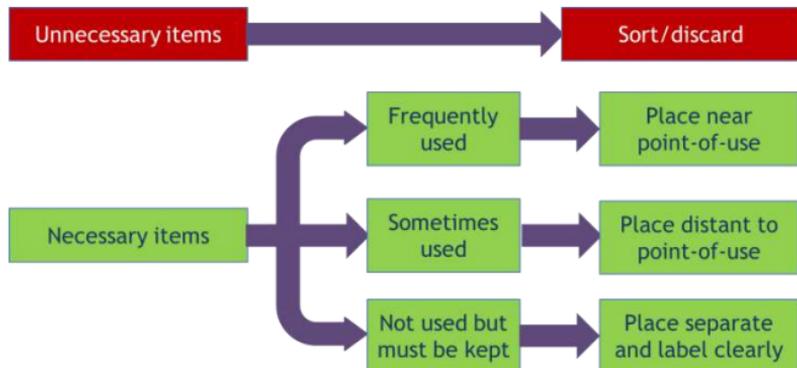
Before and After comparisons -  
(photographs for example)



# 6S and Visual Management

**Visual Control:** We can tell right away whether a particular operation is proceeding normally or not

## Implementation steps



## Benefits

- All necessary tools & equipment easily accessible
- Reduced effort and frustration
- Storage locations carefully considered and labelled

## Outcomes

- New area layout
- Listing of labels required (text, colour, size)
- New racking or shelving where required
- Floor marking completed

# 6S and Visual Management

## S3 – SHINE

The Shine step involves cleaning your workplace extensively to eliminate all dirt, grease and dust from the floor, machines, materials and equipment.

- This will ensure and verify that everything is ready for use.
- Cleanliness leads to inspection and early detection of problems.
- Shine contributes to improved Morale, Safety, breakdowns prevention and defect prevention.

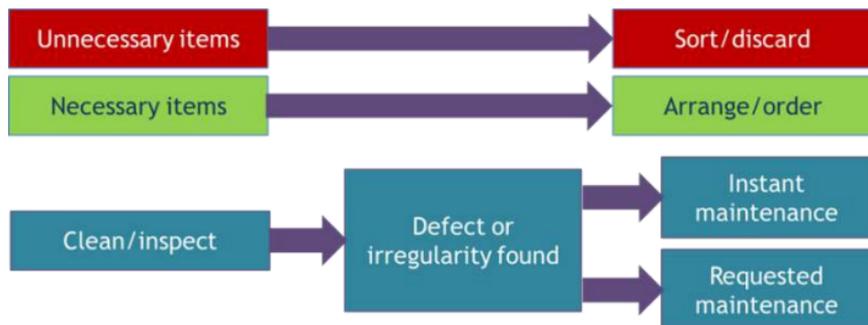
### Implementation tips

- Define Target Areas
- Draw map of areas and determine parts, equipment and space to be inspected/cleaned
- Distribute responsibility for 6S to named individuals
- Create a cleaning schedule to be completed for each area and identify the people who will complete the cleaning tasks
- Devote certain times exclusively to cleaning and inspection e.g. 5 minute “shine”
- Define a minimum standard for each area
- Develop a cleaning checklist
- Establish a minimum requirement for cleanliness

# 6S and Visual Management

The best time to find defects, dents, and scratches is when you are hand washing your car. Likewise, the best time to find defects and safety problems, and equipment issues is when you are cleaning your work area

## Implementation steps



## Benefits

- Maintain the first 2 S's: Sort & Set-in-order
- Problems/defects are easier to see
- Less likely to have a tripping hazard
- A clean work area promotes improved morale

## Outcomes

- Map of the area, divided into cleaning zones
- A checklist of cleaning activity per person per zone
- A sheet showing the cleaning schedule (Planned and actual)

## S4 – STANDARDISE

The Standardise step establishes the platform to maintain and improve continuously the level of organisation and readiness in the workplace.

- Not just when the boss is around
- Not just at the beginning of the week for the audit
- Not when visitors are scheduled
- But as a regular function of your daily activities

Make first three S's "unbreakable" - the state that exists when S1, S2 and S3 are properly maintained.

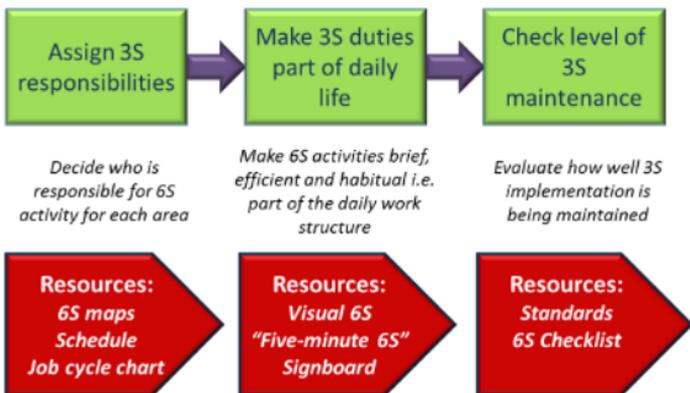
The methodology for each of the first three steps needs to be standardised for the organisation.

Roles and responsibilities need to be clear, and training completed where necessary. Employees at all levels will need to know how to apply 6S techniques consistently.

There is only One Right Way to do the work: The Standard; everybody follows this standard until we have found a better one.

# 6S and Visual Management

## Implementation steps



### Benefits

- Maintains the higher morale gained in the first three steps
- Minimal investment in time - goal is 5 minutes per person per shift
- Less downtime for equipment

### Outcomes

- A description of the defined standard for the area
- Photographs of the area
- Audit requirements defined
- Visual display of the key documents which were the outputs of the Sort, Set-in-order and Shine steps e.g. map, cleaning zones, cleaning schedules etc.

# 6S and Visual Management

## S5 – SUSTAIN

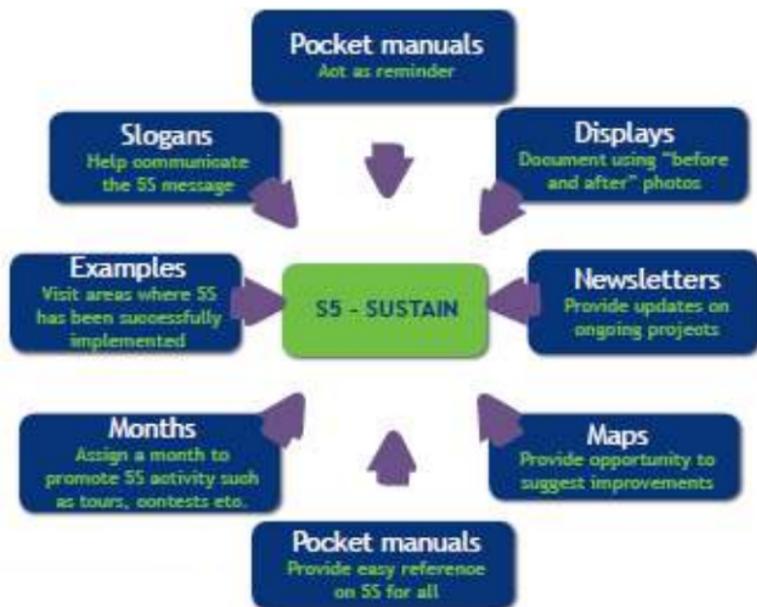
Make a habit of properly maintaining correct procedures. The aim is to build a Continuous Improvement culture which recognises standards and invests in maintaining and developing them.

### Sustaining – How?



# 6S and Visual Management

## Implementation tips



### Benefits

- The main benefit of the Sustain step is that the first four steps continue to be executed by the company. The full benefit of a 6S program is not accrued until all steps are implemented and sustained

### Outcomes

- A completed audit sheet
- A completed corrective action sheet

# 6S and Visual Management

## S6 – SAFETY

Safety must be a primary consideration while implementing any 6S programme.



Safety is a universal responsibility for all employees in an organisation

On completion of the first 5S', safety will be enhanced.

Having completed the Sort, Set-in-order and Shine steps the working environment should be free from clutter and well-organised.

Implementing the 6S steps should eliminate all hazards and verify that suitable control measures are in place.



# 6S and Visual Management

## Implementation tips

### Ensure that:

- All safety equipment is present and is regularly maintained e.g. fire extinguishers, Personal Protective Equipment (PPE), First Aid kit
- All required signage is in place e.g. exits, hazards
- All trip hazards are eliminated
- All electrical cabling is safely routed
- All equipment and lighting is in working order
- All floor surfaces are in good condition
- All walkways and stairways are clearly marked and free from material and other obstacles

### Benefits

- Reduced injuries and work-related illnesses
- Cost savings – avoid medical and insurance costs
- Improvements in productivity and morale

### Outcomes

- All equipment/lighting in working order
- Clear signage
- Marked walkways cleared of obstructions

## TEMPLATES

A selection of standard forms are presented on the succeeding pages, to assist in any 6S implementation.

These are listed as follows:

1. **Approved material and equipment list** – to help standardise the material and equipment which is needed
2. **Corrective action log** – to track actions to completion
3. **6S Map** – to document the current state and plan/document the improved layout
4. **6S Evaluation form** – to facilitate the audit process
5. **Daily 6S schedule** – to help set out the schedule for 6S activities
6. **Problem/Countermeasure sheet** – to record issues/opportunities for improvement and the measures proposed to resolve the issue or introduce the improvement

Please note that the original templates are available from [www.lbspartners.ie](http://www.lbspartners.ie)





# 6S and Visual Management

## 3. 6S map

<b>6S Map</b>		LBSPartners	
Date	Address	Area	
Time			



# 6S and Visual Management

## 5. Daily 6S Schedule

6S		Task No.	Description	Zones	LBSPartners											
					Shift	Mon	Tues	Wed	Thur	Fri	Sat	Sun				
				First												
				Second												
				Third												
				First												
				Second												
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# 6S and Visual Management

## 6. Problem/Countermeasure Sheet

**Problem/Countermeasure Sheet**

#	Problem (Sketch/Words)	Countermeasure (Sketch/Words)	Benefit		Person Responsible	By When	Status
			Current	Target			
1							⊕
2							⊕
3							⊕
4							⊕
5							⊕
6							⊕
7							⊕
8							⊕
9							⊕
10							⊕



Problem identified



Countermeasure identified



Countermeasure implemented



Countermeasure validated





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