

A Review Paper on Visual Factory

Shubham Borkar¹, Avnish Rai²

¹Student, Department of Mechanical Engineering, Bhivarabai Sawant College of Engineering & Research, Maharashtra, India

²Student, Department of Mechanical Engineering, Symbiosis Institute of Technology, Maharashtra, India

Abstract - A visual factory is a system of aids which organizes and controls the workplace environment and maintains the productivity standards and also allows for efficient conveyance of information. It is an idea or mechanism of lean Manufacturing system that helps the operators and the managers to have effective communication throughout the organization.

Key Words: Total Productive Maintenance, Lean Management System, Visual Factory, Visual Display, 5's

1. INTRODUCTION

In today's competitive world each organization has to maintain high quality, defects free products at optimum cost. To achieve this many of the organization has adopted lean manufacturing system, Total productive management, in manufacturing domain and service sector. Visual factory is an integral part of lean manufacturing which intends to develop quality culture and effective communication. [1]

Visual language enables the organizations associated to quickly distinguish between the desired (standard) situation and abnormalities in manufacturing process. In a visual factory workplace every item has defined location and remains there except when in use. [2] Each and every activity in an organization has a defined standard process which is well communicated and clearly visible through visualization. This paper aims to focus on basic concept of Visualization and implementing it. [3]

2. Basics of Visual Factory System

Three main elements in a visual factory system as shown below:-

ELEMENT1:- Workplace organization and standardization is the foundation of visual factory system.

ELEMENT 2:- Visual Displays for sharing information.

ELEMENT 3:- Prevention of abnormalities through error proofing.

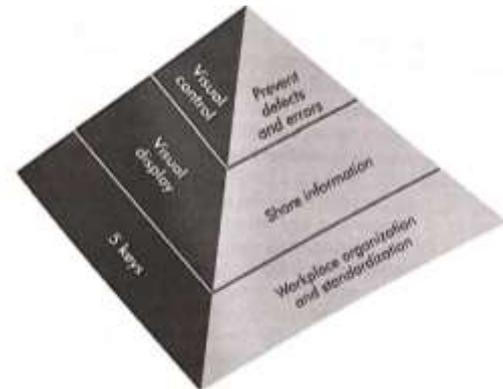


Fig1.The Visual Factory Pyramid

2.1 ELEMENT 1 (5'S)

Stability of production process is ensured by adopting 5s strategy.

- [1] Seiri (Sort):- Nothing is extra or unnecessary.
- [2] Seiton (Set in Order):- A place for everything and everything in its place.
- [3] Seiso (Shine): - The environment is immaculate and self-cleaning.
- [4] Seitketsu (Standardize): - Standards are easy to see and understand.
- [5] Shitsuke (Sustain):- Pride is created in the workplace, as well as the discipline to maintain it and continuously improve it.

2.2 ELEMENT 2 & 3 (VISUAL DISPLAYS/VISUAL CONTROLS)

Visual control and displays are a system of devices information, colour-coding, layouts and signboard standardize to create a common visual language in the workplace.

They promptly distinguish between the normal and abnormal condition, making abnormalities obvious enough to visible to everyone. Visual Control fall into the six categories, or stages as shown in visual factory pyramid Fig.1. Each stage is progressively more powerful in its capacity to share information, alert everyone, strengthen adherence and promotes prevention. Heading upward on the

visual factory pyramid there is increasing degree of visual control.

A visual display communicates the information but do not necessarily control what people or machine do. For example, information may be posted on safety chart which influences human behaviour but do not control it. Visual Display fall onto the first two levels of the visual control pyramid.



Fig.2 Visual Factory Pyramid in more detail.

Visual displays controls the information is such a way that activities are performed according to the standards. For example, painted walkways, machine guards, stop signs etc. It controls specific human behaviours. Visual controls falls into top four level of the visual control pyramid.

There are six level of visual displays and control level 1 and 2 pertains visual displays and levels 3 through level 6 covers visual control.

Level 1

In Level 1 visual displays the results of the control activities is being displayed which lets everyone to inspect how closely the performance conforms to expectations.

Eg:- Graphs Indicating Performance.

Level 2

Level 2 visual display involves sharing of standards at the workplace which lets everyone to follow the standard specification and method.

Eg:- Post instructions, Procedures, Diagrams etc.near the workplace.

Level 3

A level 3 visual control involves building standards into the workplace.

Eg. Status Board with lights.

Level 4

A level 4 visual control warns of abnormalities with something alarming like bell.

Eg. If car door is opened the lights gets on.

Level 5

A level 5 visual control stops abnormalities with a device. This is like machine shutdown.

Level 6

A level 6 visual control prevents the abnormalities.

Eg. Device that automatically switches off lights when a car engine is turned off.

EXAMPLES

- **Signboards** indicate what belongs where and in what amount. So anyone can understand where everything is supposed to be.
- **Status Board** immediately alerts everyone about any abnormalities occurring on the shop floor.
- **Red Tagging** helps distinguish between needed and unneeded items in the workplace.
- **Error prevention boards** document the type of errors that occur in the work area and highlights on going effort to reduce them.
- **Standardize worksheet** used to indicate the agreed upon way to perform operations within work area. These sheets to be displayed at each workplace.

3.IMPLEMENTING OF VISUAL FACTORY SYSTEM

To create a visual factory system, a straightforward implementation of steps and level described in the visual factory pyramid is needed.

3.1 Steps:

1. Identify and prepare the area to be implemented.
2. Choose the starting point.
3. Follow the 5's strategy.
4. Implement visual display and control.
5. Visualize standards and abnormalities.
6. Conduct periodic review of the Visual factory system.
7. Identify Improvement area.
8. Improve techniques where possible.
9. Standardize any changes implemented.
10. Clearly communicates the desired standards.

4. BENEFITS OF VISUAL DISPLAY

[4] Lean Manufacturing: A Plant Floor Guide, On Jan 1, 2001, J. Allen

A visual factory has many benefits. It:

- Promotes zero defects:-Condition for zero defects, zero failures, and zero waste are established and maintained by all.
- Shares information: - It makes visible all information needed for effective control of storage, operations, equipment, quality and safety, current status, and improvement targets.
- Alerts everyone to abnormalities: - Every standard must be easily available so that any deviation or abnormality can be instantly detected.
- Aids in quick Recovery: - Because all abnormalities are easily available, abnormal conditions are corrected quickly.
- Promotes worker autonomy: - Adherence to standards increases when everyone sees how the system is intended to function.
- Supports continuous improvement:- Stakeholders can look closely at each part of the processes and find more opportunities for improvement.

5. CONCLUSIONS

Implementing a visual factory system can help the lean implementer in many ways. It can reduce the amount of time spent in searching for the supplies, tools, equipment, people, or information. Visual factory eliminates much frustration, such as those caused by not having the supplies, equipment, or information where and when it is needed, increases the safety in the workplace by communication safety standard.

Visual factory is a system for organizing works that eliminates any chance of defects or waste. In order to implement quality management system successfully each activity should aim for excellence. Visualization is one of the tools of lean production in order to achieve those aims. It also allows user to function without any defects or mistake as it warns abnormalities. Successful visualization implementation results in increase of productivity with zero defects and waste.

REFERENCES

- [1] <http://www.sixsigmacertificationcourse.com/what-is-visual-factory/>
- [2] <https://www.graphicproducts.com/articles/creating-a-visual-factory-with-the-5s-system/>
- [3] <https://www.visualfactory.net/>