

P-3676



IMPLEMENTATION OF VISUAL  
MANAGEMENT SYSTEM  
IN TRIDENT PNEUMATICS PRIVATE LIMITED,  
COIMBATORE



A project report

Submitted

By

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Under the guidance of

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In partial fulfillment of the requirements  
for the award of the degree

of

**MASTER OF BUSINESS ADMINISTRATION**

**Department of Management Studies**  
**Kumaraguru College of Technology**  
(An autonomous institution affiliated to Anna University, Coimbatore)  
**Coimbatore - 641 049**

**November, 2011**

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Date : 05/08/2011

**PROJECT COMPLETION CERTIFICATE**

This is to certify that **Mr. SivaGanesh P** , Roll No. **10MBA54**, a Student of **TRIDENT Business School, Kumaraguru College of Technology, Coimbatore – 641 006** has undergone a Project entitled

**VISUAL MANAGEMENT SYSTEM**

between **27.06.11** and **05.08.11**.

During the tenure, his performance was very Good.

Organization Guide's

Name : R. Sivakumar  
Designation : Operation Manager  
Mobile No. : 9994978921

A handwritten signature in black ink, appearing to read "R. Sivakumar", with a long horizontal stroke extending to the right.

**Signature of the Organizational  
Guide**





## BONAFIDE CERTIFICATE

Certified that this project report titled “**Implementation of Visual Management System in Trident Pneumatics Private Limited, Coimbatore**” is the bonafide work of **Mr.P.Sivaganesh, 10MBA54** who carried out the project under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

A handwritten signature in black ink, appearing to read 'A. Senthil Kumar', with the date '17/11/11' written below it.

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**Assistant professor (SRG)**

**KCTBS**

A handwritten signature in black ink, appearing to read 'Dr. Vijila Kennedy', with a long horizontal line extending to the right.

Director

**Dr. Vijila Kennedy**

**(KCTBS)**

Submitted for the Project Viva-Voce examination held on

18/11/11

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Internal Examiner

A handwritten signature in black ink, appearing to read 'Dr. Vijila Kennedy', with the date '18/11/11' written above it.

External Examiner

## **ACKNOWLEDGEMENT**

I express my sincere gratitude to our beloved Chairman **Arutchelvar Dr. N. Mahalingam and Management** for the prime guiding spirit of Kumaraguru College of Technology.

I wish to express deep sense of obligation to **Mr. A. Senthil Kumar** Assistant Professor (Senior Grade) in Management, Project Guide, for his intensive guidance throughout my project.

I thank **Mr K. Sivakumar** operations manager and **Mr.Sathish Kumar** HR Manager, for their valuable support and guidance throughout my project.

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**CHAPTER 1**  
**INTRODUCTION**



## **CHAPTER 1 INTRODUCTION**

### **1.1 INTRODUCTION TO THE STUDY:**

Visual management system is used to improve quality through prevention, detection and resolution and to increase the workplace total efficiency and safety to reduce the total cost.

Visual management can be addressed by visual display and visual control. Visual displays present information, while visual control focuses on action needs. Information needs address items such as schedules, standard work, quality, and maintenance. Visual control can address whether a production line is running according to plan and highlights problems.

Visual controls are means, devices, or mechanisms that are designed to manage or control the operations so as to meet the following purposes:

Make the problems, abnormalities, or deviation from standards visible to everyone and thus corrective action can be taken immediately,

Display the operating or progress status in an easy to see format, provide instruction, convey information, and provide immediate feedback to people.

Therefore it is the principle of increasing efficiency and effectiveness simply by deliberately making things visible. When things are visible, they are kept in conscious mind. It also serves to ensure that everyone has a common viewpoint of what is being displayed. Visual control (VC) is known in several other terms, visibility management, management by visibility, and management by sight.

#### **1.1.1 Merits of the system:**

In both manufacturing and transactional processes, visual management systems can encompass the following items

#### **1.1.2 Visual management techniques include:**

##### **1.1.2.1 Manufacturing:**

- Display boards in public area showing processes in use or un-available for use
- Lights on machines showing status (red=unavailable, Yellow=available but not in use, Green=in use).

- Business/performance metrics posted in public areas, showing throughput and quality performance in a common format.

### **1.1.2.2 Transactional:**

- Status board in public area showing personnel availability
- In and out boxes in public area showing queues and backlogs
- Pegboard showing who has what job with tags or markers
- Status boards in public areas reporting error rates and cycle time performance in a common format.

## **1.2 INDUSTRY PROFILE:**

**1.2.1 Industry served:** The Company serve a variety of industries, some of which include

### **1.2.1.1 General industry:**

Trident ranges of products are exclusively designed for various industries like:

- Textile
- Auto mobile
- Foundry
- Engineering
- Metallurgy
- Power
- Medical
- Aviation

### **1.2.1.2 Petroleum, power, metallurgy, custom solution:**

Trident manufactures air dryers meeting the exacting standards of the petroleum industry for both onshore and offshore use. We are approved by almost all Project Consultants. We manufacture products and plants to the specification of the customer and consultants. Our products include large, automated heated desiccant dryers to very small very high pressure refrigeration dryers.

### **1.2.1.3 Rail road products:**

Trident manufactures a range of rail road products to improve the quality of compressed air in braking systems. Trident has bagged various contracts for manufacturing the Rail Road Air dryers from world leaders.

#### **1.2.1.4 Off Road Vehicle Dryers**

Trident is the OEM supplier of Off Road vehicle Brake dryers to BEML(Komatsu) and Caterpillar India. These dryers are used for the compressed air line of dumpers and other off road vehicles in order to protect the braking system which works completely on compressed air.

### **1.3 COMPANY PROFILE:**

**1.3.1 Company name:** Trident Pneumatics Private Limited.

**1.3.2 Company logo:**



**1.3.3 Company website:** <http://www.tridentpneumatics.com>

#### **1.3.4 History:**

Trident pneumatics pvt ltd was established in the year 1988, the company engaged in manufacturing compressed air treatment products which includes Drain Valve - Condensate Sensing and Timer Type, Submicron Filters, Adsorption Air Dryer, Refrigeration Dryers, Dryers for Locomotives and Trucks and Flow Meters. Strong R & D capabilities and engineering expertise helps to bring out revolutionary concepts such as timer type condensate drains, sensing type drains and modular dryers.

Trident pneumatics limited is situated in the outskirts of Coimbatore in the place of KNG Pudur. It is one of the well known companies in the manufacturing of dryers, filters and accessories. This company was ISO 9001:2000 certification registered firm.

Trident pneumatics limited has attained growth at a regular pace. The main customers are the industrial customers and they manufacture varieties of products and services such as auto drains, refrigeration dryers, desiccant dryers, compressed air filters, compressed air dryers, locomotive Air dryers, circuit breaker dryers, brake dryers and dental dryers.

Trident pneumatics partners with OEM's leading compressor manufacturers across industries and customers in niche market segments including Railways and Petrochemical industries.

**1.3.5 Turn over:** rupees 17-32 crores

**1.3.6 Cost involved:** as on 2010-2011 share capital of rupees 30 crores.

**1.3.7 Promoters and Board of Directors :**

Mr. KS. Natarajan, Managing Director

Mrs. Saraswathy, Director

**1.3.8 Sales in past 3 years:**

2008-2009: 14.50 cr200

2009-2010:15.58 cr

2010-2011: 17.32 cr

**1.3.9 Product/Service:**

Auto Drains,

Refrigeration Dryers,

Desiccant Dryers,

Compressed Air Filters,

Accessories,

Compressed Air Dryers,

Locomotive Air Dryers,

Circuit Breaker Dryers,

Brake Dryers,

Dental Dryers.

**1.3.10 Main markets:**

North America,

South America,

Eastern Europe,

Southeast Asia,

Africa,

Oceania,

Mid east,

Eastern Asia,

Western Europe.

**1.3.11 Main customers:** all industrial customers

**1.3.12 Competitors:** gem equipment, summit, atlas copco.

**1.3.13 Awards and achievements:** Quality award from ELGI for the year 2010-11

ISO 9001 - 2008

#### **1.4 STATEMENT OF THE PROBLEM:**

Visual Signals about the ongoing production process are essential for effective production layout setup. Hence, the problem for the study is to design a visual management system for the production process.

#### **1.5 OBJECTIVES OF THE STUDY:**

##### **1.5.1 Primary objectives:**

- To design and implement a visual management system.

##### **1.5.2 Secondary objectives:**

- To design visual display of attendance roll.
- To design visual display of incoming material.
- To design visual display of the weekly plan of manufacturing cell.
- To design visual display of the production orders on the queue.
- To design visual display of the materials purchased and in stock.
- To design visual display of outgoing material.
- To design visual display of the status of on-going production order.
- To design visual display of the major production order.
- To design visual display of the quality assurance.
- To design visual display of the finished stock status.

#### **1.6 SCOPE OF THE STUDY:**

The scope of the study is within the organizational framework of Trident pneumatics pvt ltd. The study focuses only on the shop floor setup.

**CHAPTER 2**  
**REVIEW OF LITERATURE**

## CHAPTER 2 REVIEW OF LITERATURE

LEAN VISUAL MANAGEMENT IN AN ERP/MES-CONTROLLED PRODUCTION CELL by Brian M. Kisby B.S. 2003, M.S. 2007 Mechanical Engineering Brigham Young University

Thesis advisor: Deborah J. Nightingale Professor of Aeronautics & Astronautics and Engineering Systems Co-Director, Lean Aerospace Initiative Janice Klein Senior Lecturer, MIT Sloan School of Management

As a company grows, more and more effort is needed to control and coordinate operations. Typically, this is accomplished through an evolving collection of systems and processes, such as an Enterprise Resource Planning (ERP) system, but such systems also influence how a company does business, reviews performance, and communicate results. Manufacturing Execution Systems (MES) are often used in conjunction with ERP systems to streamline and enable actual manufacturing processes. A third type of system, the visual management system, is used to take production out of the closed, computerized realm and make it open, intuitive, and efficient. Visual Management, as a lean concept, can be a simple and effective means to efficiently regulate inventory levels and production activities. However, when visual management systems are to be embedded within a broader ERP/MES system, certain conditions and support systems are requisite, the absence of which will render the visual management system ineffective, at best, or destructive, at worst. Furthermore, there are fundamental issues around implementing visual management, be it high-tech or low-tech. This thesis will describe a case study of the process to manage the design and implementation of a visual management system, while addressing various stakeholders' needs and refined business objectives. Theories and frameworks of Enterprise Architecting and Change Management are utilized to analyze which functions the visual management system should perform and how to achieve operator buy-in.

Article submitted by Nick Kroll - Trico Corporation

## Visual Management in Production Management

One of the core components to lean manufacturing is a solid 5S visual management system. It is easier to manage an operation if you can fully understand it, and understanding often comes from being able to “see” what is happening. The 5S visual management system is designed to create a visual workplace - an environment that is self-explaining, self-ordering, and self-improving. The 5S system consists of five elements.

These elements are Sort (eliminate those things not truly necessary, remove the clutter), Set in order (organize that which is necessary to minimize waste), Shine (keep areas clean and well-ordered with regular inspections), Standardize (document and communicate what good condition looks like), and Sustain (institutionalize through process development and training). Self-explaining, self-ordering, and self-improving - visual management assists in the simplification of work management systems. If an employee can visually see what is required of them, their work becomes easily understood and as a consequence they become more efficient and productive. Practically speaking, putting visual management systems in place is one of the simplest lean ideas to implement.

Lean is about eliminating waste and unscheduled equipment downtime is wasteful. Therefore, lean has application in improving asset reliability. All maintenance and operations environments are challenged to do more with less. There are real challenges to be faced every day with the requirement to maintain (and expand) production with fewer skilled personnel. Skilled personnel are retiring and they are either not being replaced or their replacements are not fully trained with the proper procedures. Applying lean techniques in the interest of improving asset reliability can help.

Visual management can be applied to a plant facility on a wide scale basis. In fact, many plant facilities already utilize visual aids by identifying piping systems (pneumatic, natural gas, various gases, etc), electrical wiring (control, connections), and locations of danger (paint on floors or railings, emergency phone locations), etc... Applying visual management techniques in the interest of improved reliability can occur on a step by step basis. One of the best places to start is with the lubrication management program. Creating a system of well tagged and even colour coded lubrication points will help maintenance personnel and operators clearly understand what lubricants are appropriate for each application. The system



needs to be applied from the moment lubricants are received in inventory all the way through the chain to the specific lubrication point on the equipment and then to lubricant disposal. In most facilities, lubricants are handled by a variety of people (with different responsibilities) and in a variety of locations throughout the chain. A simple tagging and coding system will assist in helping employees understand the internal supply chain ensuring that the right lubricant gets to the right application.

A lubrication assessment or audit is an important step in fully understanding what lubricants are being used in the facility, what lubricant is required for each lubrication point on the equipment, the frequency of lubrication, and the method of lubrication required. Most lubrication assessments/audits are very comprehensive covering many additional aspects of the lubrication program, but these mentioned are key components. The understandings mentioned take time to establish, but investing this time is important. It is equally important to put a system in place to ensure the understandings reach throughout the operation and employees clearly “see” what is required.

Colour coding is now available for lubrication systems reaching from lubricant receipt and storage through the lubrication room to the point of application. Colour tags or identifiers can be assigned to designated lubricants. Assigning specific colours to designated lubricants (both oils and greases) allows for a tagging system to be deployed throughout the lubricant chain within the facility. From the point of storage to the point of application, the operator and/or maintenance person will know which designated lubricant is supposed to go to each specific equipment lubrication point. This is an excellent example of employing visual management within the lubrication program in the interest of lean (in its simplest form). A system like this minimizes the opportunity for error as the individual(s) performing the lubrication tasks does not need to know specifically which lubricant is used with each equipment application. The colour can be identified with lubricant type and/or lubrication frequency. As long as the system is set up properly, documented well, and deployed thoroughly with the necessary identifiers, the individual(s) performing the tasks can understand what is required without needing to be “experts” in lubrication. No employee should have to rely on memory and no employee should be performing a task that he/she has not been trained in and competent in.

Help your employees “see” what is required of them by implementing a visual management system. Simple can be better and more reliable. Managing the information they are required to know will improve their effectiveness.

**CHAPTER 3**  
**RESEARCH METHODOLOGY**

## **CHAPTER 3 RESEARCH METHODOLOGY**

This chapter explains the research tools that have been applied by the researcher to collect data analyze and interpret results. In this study, the researcher seeks to understand the current situation and process followed by Trident Pneumatics Private Limited. Results obtained were analyzed and used as a measure to decide on the appropriate automated production process to be implemented. Research methods are a program that guides the researcher in collecting, analyzing and interpreting data and facts. The following tools were used in this research:

**3.1 Type of study:** The study is Descriptive in nature.

**3.2 Sources of Data:**

The study uses Secondary data.

**3.3 Tools used in this research:** Visual Display technique.

**3.4 Limitations:**

- The study is confined only to the production setup.
- The outcome of the study may be applicable only to Trident pneumatics pvt ltd

## **CHAPTER 4**

### **DATA ANALYSIS AND INTERPRETATION:**



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<b>TABLE 4.2 INCOMING MATERIAL</b>		
<b>INCOMING MATERIAL</b>		
<b>TOTAL NUMBER OF INCOMING MATERIAL</b>	<b>NO OF INCOMING MATERIAL WAITING FOR INSPECTION</b>	<b>NO OF INCOMING MATERIALS INSPECTION DONE</b>

<b>TABLE 4.3 MANUFACTURING CELL</b>			
<b>MANUFACTURING CELL</b>			
<b>WEEKLY PLAN</b>	<b>NC'S</b>	<b>PRODUCTION DELAY</b>	<b>TODAYS WORK</b>







TABLE 4.6 OUT GOING MATERIALS					
OUT GOING MATERIALS					
TOTAL NO OF OUT GOING MATERIALS		REWORK		REJECTION	
ITEM	QTY	QTY	SUPPLIER	QTY	SUPPLIER

TABLE 4.7 PRODUCTION						
PRODUCTION						
TOTAL NO OF SALE ORDERS	TODAYS DISPATCH		NO OF SALE ORDERS CROSSED DELIVERY DATE			MAJOR ITEMS TO BE RECIEVED FROM MATERIALS
	PLAN	ACTUAL	MORE THAN 2 DAYS	MORE THAN 1 WEEK	MORE THAN 2 WEEKS	

<b>TABLE 4.8 PROJECT / CUSTOM SOLUTION</b>	
<b>PROJECT / CUSTOM SOLUTION</b>	
<b>MAJOR ORDER PROGRESS SCHEDULE</b>	<b>MAJOR MATERIAL SHORTAGE</b>

TABLE 4.9 QUALITY ASSURANCE						
QUALITY ASSURANCE						
NC'S	NC'S		CAR	CAR		
	QTY	DEPT		QTY	FINISHED	PENDING



Exhibit 1 Example: Display board for attendance roll in the company

TODAYS ATTENDANCE													
STAFFS			WORKERS			ATTENDANCE CALANDER OF THE MONTH							
DEPT	NUMBER		DEPT	NUMBER		WEEK					1		
	PRES ENT	ABS ENT		PRE SEN T	ABS ENT	MONTH					1		
						SUNDAYS							
						HOLIDAYS							
MARKETING	6	0	DP	8	0	1	2	3	4	5	6	7	
R&D	5	1	LOCO DRY	6	1	66							
PURCHASE	6	0	CNC	4	4	,1							
PRODUCTION	4	2	ELECTRONIC S	8	0	1	8	9	10	11	12	13	14
CS	5	1	DPS	6	2		15	16	17	18	19	20	21
QC	2	0	CS	6	0		22	23	24	25	26	27	28
OTHERS			OTHERS				29	30	31				

Exhibit 2 Example: Display board of attendance roll in the company





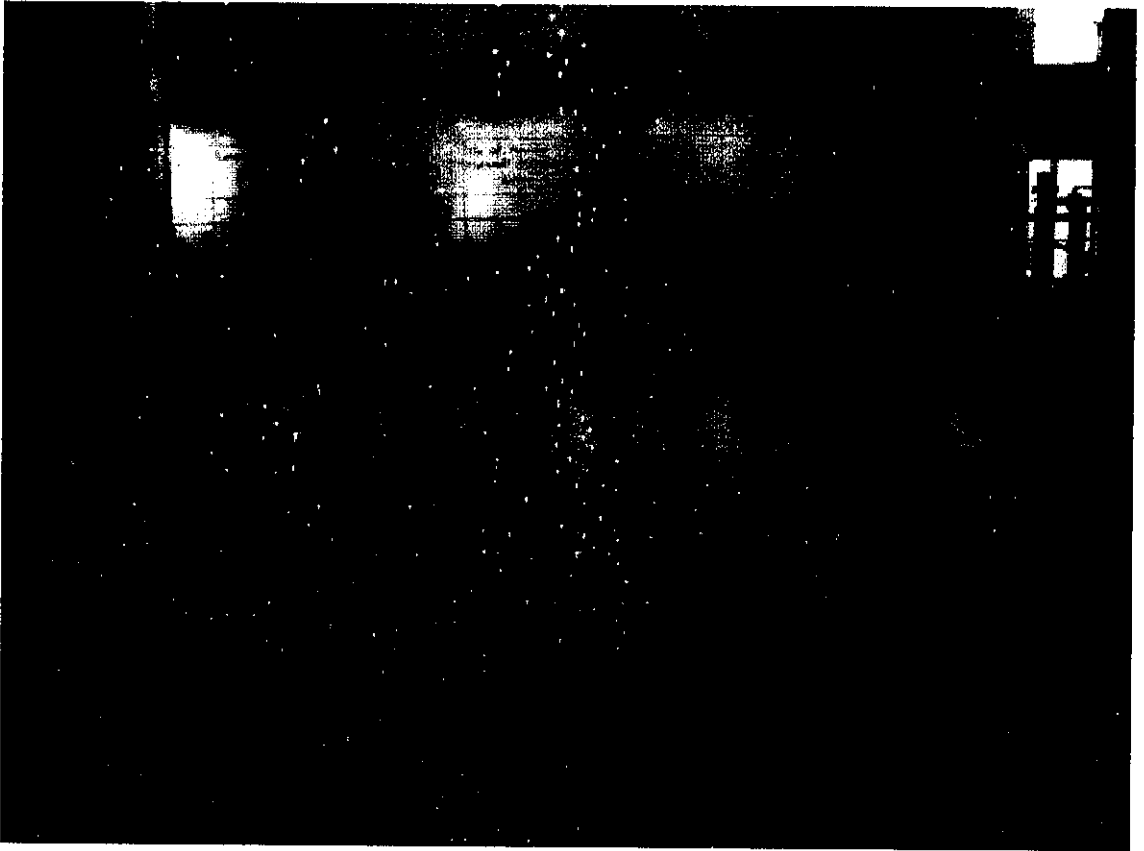
Exhibit 3 Example: Display board for incoming material in the company

INCOMING MATERIAL		
TOTAL NUMBER OF INCOMING MATERIAL	NO OF INCOMING MATERIAL WAITING FOR INSPECTION	NO OF INCOMING MATERIALS INSPECTION DONE
4(dry spell)	4	2
5(cold spell)	5	5
7(cnc)	7	5
8(dps)	8	0
9(loco dry)	9	9

Exhibit 4 Example: Display board for outgoing material in the company

OUT GOING MATERIALS					
TOTAL NO OF OUT GOING MATERIALS		REWORK		REJECTION	
ITEM	QTY	QTY	SUPPLIER	QTY	SUPPLIER
Air dryers	24	2	Elgi	1	summit

Exhibit 5 Example: Display board for incoming and outgoing material in the company



## Exhibit 6 Example: Display board for production status in the company

PRODUCTION						
TOTAL NO OF SALE ORDERS	TODAYS DISPATCH		NO OF SALE ORDERS CROSSED DELIVERY DATE			MAJOR ITEMS TO BE RECIEVED FROM MATERIALS
	PLAN	ACTUAL	MORE THAN 2 DAYS	MORE THAN 1 WEEK	MORE THAN 2 WEEKS	
60(11.10.11)	60	50	10	5	2	2
50(12.10.11)	50	45	5	3	1	6

Exhibit 7 Example: Display board for production status in the company

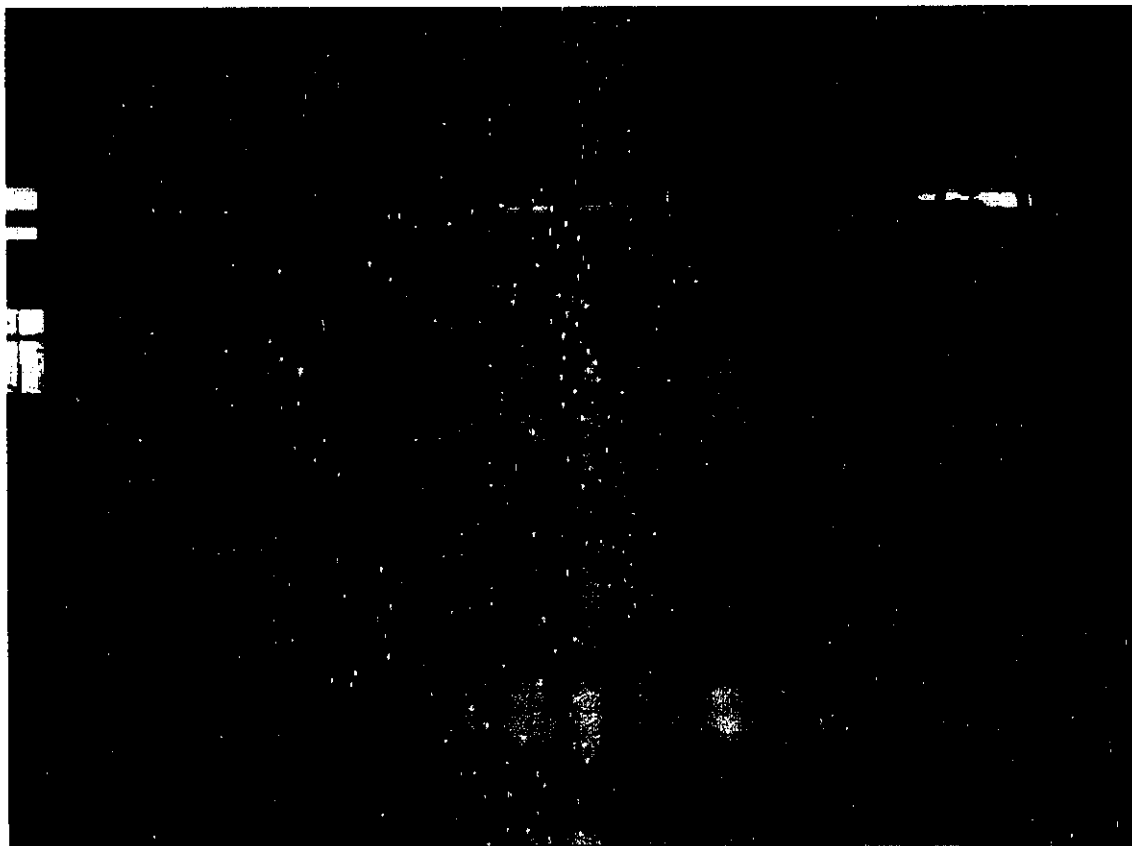
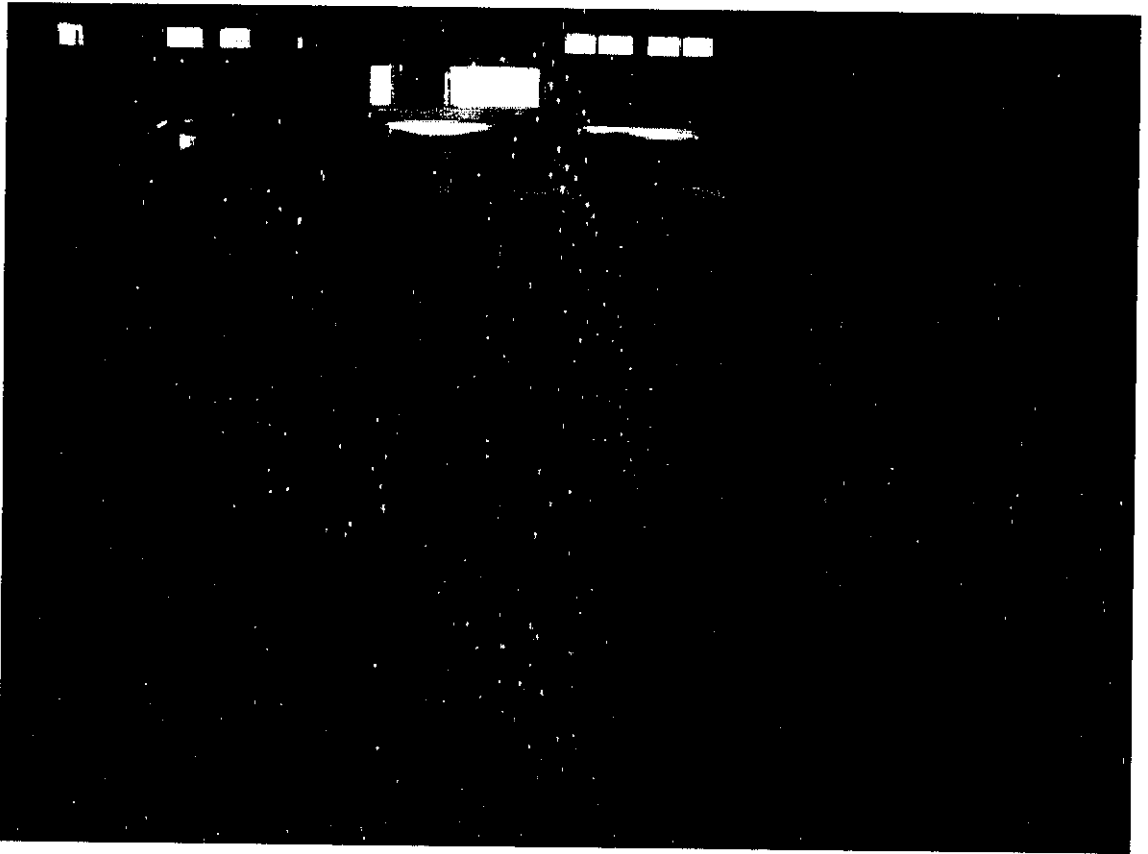


Exhibit 8 Example: Display board for stock status in the company

STOCK STATUS								
PACKED DATE	SECTIONS							
	DP DRYERS	LOCO DRYERS	DRY SPELL	DRAIN VALVES	ITERGRATED DRYER	VX2	ADV	COLD SPELL
14.11.11	100	56	50	45	60	60	50	50
15.11.11	80	60	50	50	40	35	60	20

Exhibit 9 Example: Display board for stock status in the company



**Exhibit 10 Example: Display board for manufacturing cell in the company**

<b>MANUFACTURING CELL</b>			
<b>WEEKLY PLAN</b>	<b>NC'S</b>	<b>PRODUCTION DELAY</b>	<b>TODAYS WORK</b>
Dry spell-heatless air dryers	2	3 days	Dry spell



Exhibit 11 Example: Display board for marketing section in the company

MARKETING							
NO OF PO'S WAITING FOR SALE ORDER	NO OF PO WAITING FOR CLARIFICATION		NO OF PO'S WAITING FOR MORE THAN 2 DAYS	SELLING COMMISSION		TA'S	SERVICE COMMISSION CLOSING
	INTERNAL	EXTERNAL		OPEN	REASON		
8	6	2	4	1	3	4	0

## Exhibit 12 Example: Display board for material purchase in the company

MATERIALS (PURCHASE)							
MAJOR ITEMS		NO OF PO'S PENDING	NO OF PO'S RECEIVED TODAY		NO OF PO'S CROSSED DELIVERY ORDER		
TO BE RECIEVED	DELAY		PLANNED	ACTUAL	MORE THAN 2 DAYS	MORE THAN 1 WEEK	MORE THAN 2 WEEKS
Incoming materials	1 weak	10	10	6	1	3	0

Exhibit 13 Example: Display board for project/custom solution in the company

<b>PROJECT / CUSTOM SOLUTION</b>	
<b>MAJOR ORDER PROGRESS SCHEDULE</b>	<b>MAJOR MATERIAL SHORTAGE</b>

Exhibit 14 Example; Display board for quality assurance in the company

QUALITY ASSURANCE						
NC'S	NC'S		CAR	CAR		
	QTY	DEPT		QTY	FINISHED	PENDING

**CHAPTER 5**  
**FINDINGS, SUGGESTIONS AND CONCLUSION**

## **CHAPTER 5**

### **FINDINGS, SUGGESTIONS AND CONCLUSION**

#### **5.1 FINDINGS:**

The need for visual displays in the following areas:

1. Attendance
2. Incoming material
3. Outgoing material
4. Manufacturing cell
5. Marketing
6. Materials
7. Production
8. Project
9. Quality assurance
10. Stock status

#### **5.2 SUGGESTIONS:**

The following suggestions are made to improve the overall efficiency of the production line.

The main objective of the study is to implement visual management system to visually present the current production status, goals, metrics, procedures, standards and expectations through the use of signs labels worksheet lights and colour coding. By implementing the visual management system the benefits would be For company: dependable production processes and asset reliability For customers: increased product consistency and confidence

For employees: clear and well defined roles, responsibilities and expectations , safer working condition.

### **5.3 CONCLUSION:**

A study to design and implement Visual Management System was done successfully in Trident Pneumatics Private Limited, Coimbatore. The visual signals about the ongoing production process were identified in the production layout setup; hence the implementation of visual management system will be beneficial to the company in various dimensions like improving quality through error prevention, detection and resolution and increasing workplace efficiency, improving workplace safety and to reduce the total cost.

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2. <http://www.bizxchange.in/Trident-Pneumatics-Pvt.-Ltd..html>
3. <http://www.tridentpneumatics.com/catalogs/airdryerheated.pdf>
4. [http://books.google.co.in/books?id=hZ9wSHysQDYC&printsec=frontcover&dq=research+methodology&hl=en&ei=XXm\\_TvKAL8fVrQfr2vW-](http://books.google.co.in/books?id=hZ9wSHysQDYC&printsec=frontcover&dq=research+methodology&hl=en&ei=XXm_TvKAL8fVrQfr2vW-)