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**335 211609**

# **INDUSTRIAL PLANTS II**

**Chapter one ó part 1.4:**

**Lean manufacturing**

**KAIZEN**

**DOUBLE DEGREE MASTER IN**

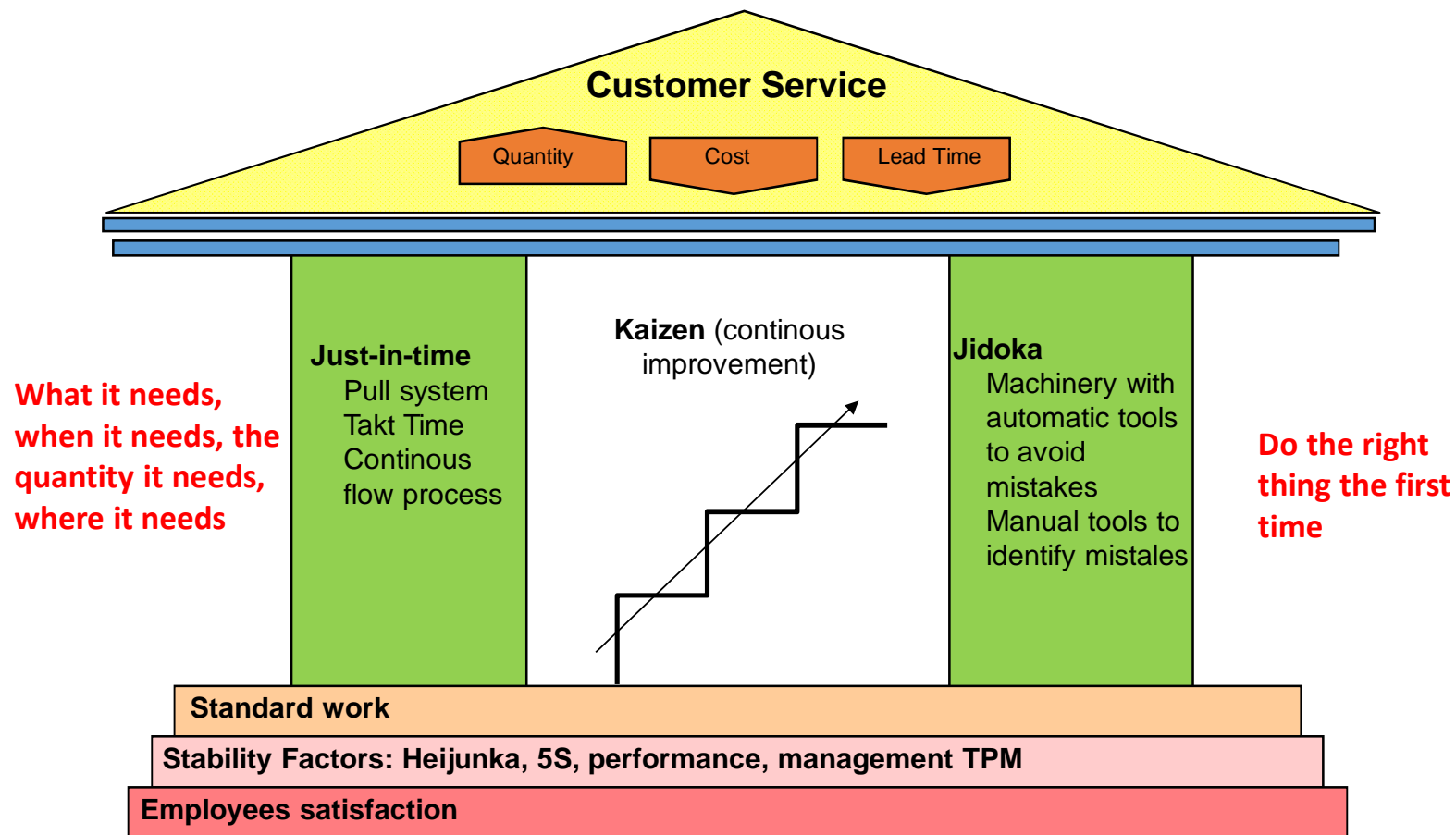
**öPRODUCTION ENGINEERING AND MANAGEMENTö**

**CAMPUS OF PORDENONE**

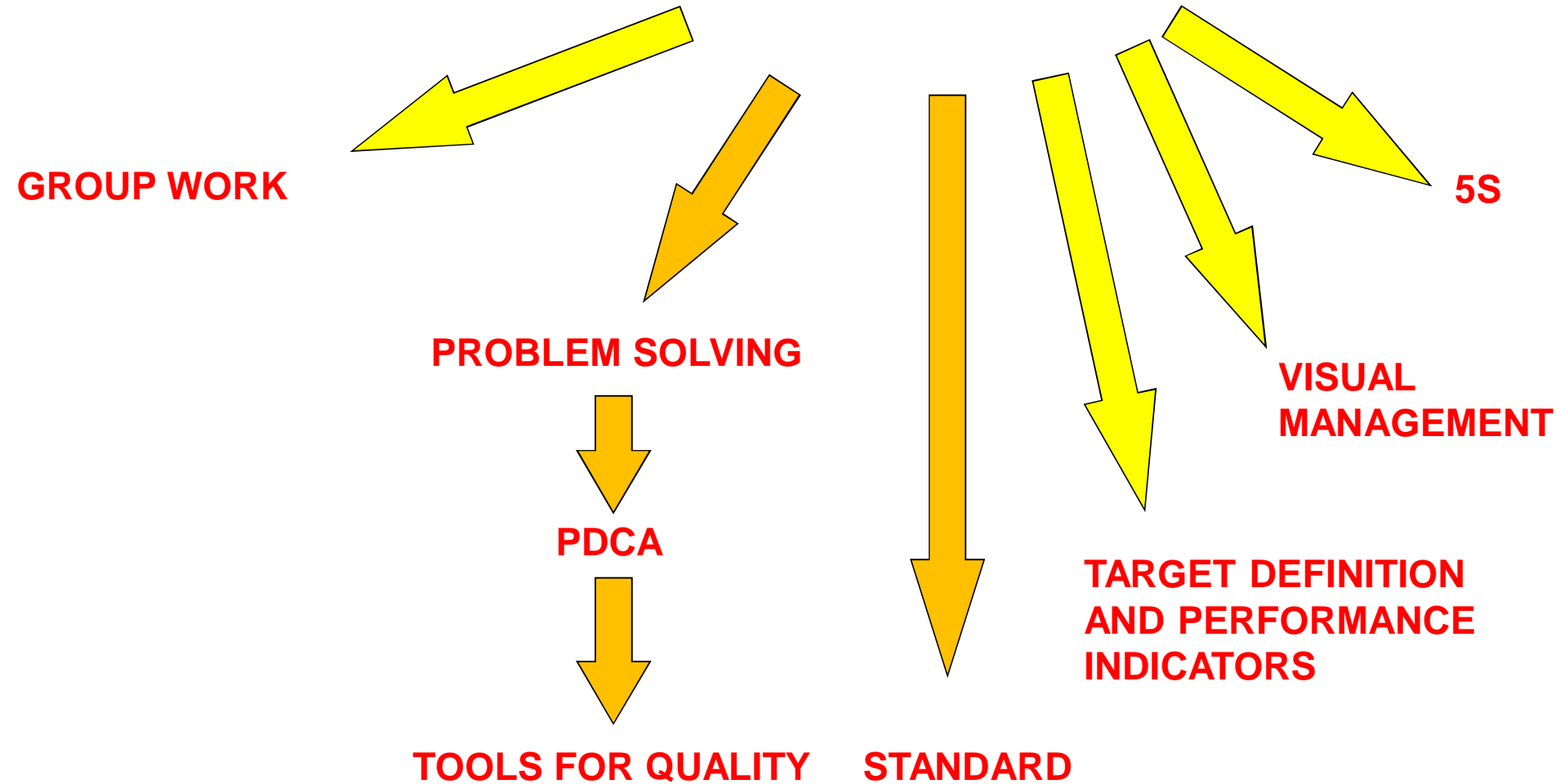
**UNIVERSITY OF TRIESTE**



# Il Toyota Production System



# CONTINUOUS IMPROVEMENT



# PERFORMANCE MANAGEMENT

TO DRIVE A CAR YOU NEED A COMPLETE DASHBOARD, SOME LEVERS AND A STEERING WHEEL

Current Values

Performance Indicators



Target Values

Levers for corrective actions



Levers for corrective actions



# PERFORMANCE MANAGEMENT

PERFORMANCE  
INDICATORS

COMPANY CULTURE

OBJECTIVES

RHYTHM

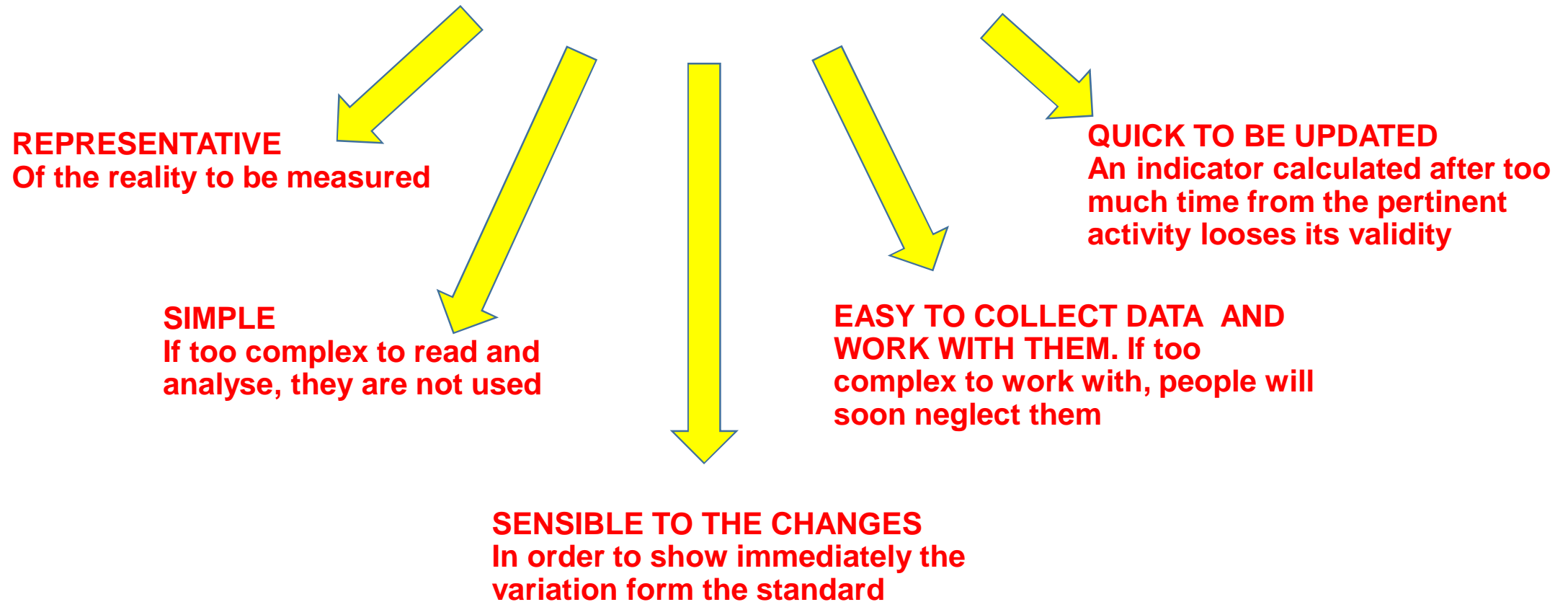
CONNECTION AMONG  
PROCESSES

PERFORMANCE ANALYSIS  
CAPABILITY



## PERFORMANCE INDICATORS

**WITHOUT A PANEL OF COHERENT PERFORMANCE INDICATORS  
YOU CANNOT KNOW WHERE THE COMPANY IS**





# OBJECTIVES

## S.M.A.R.T.

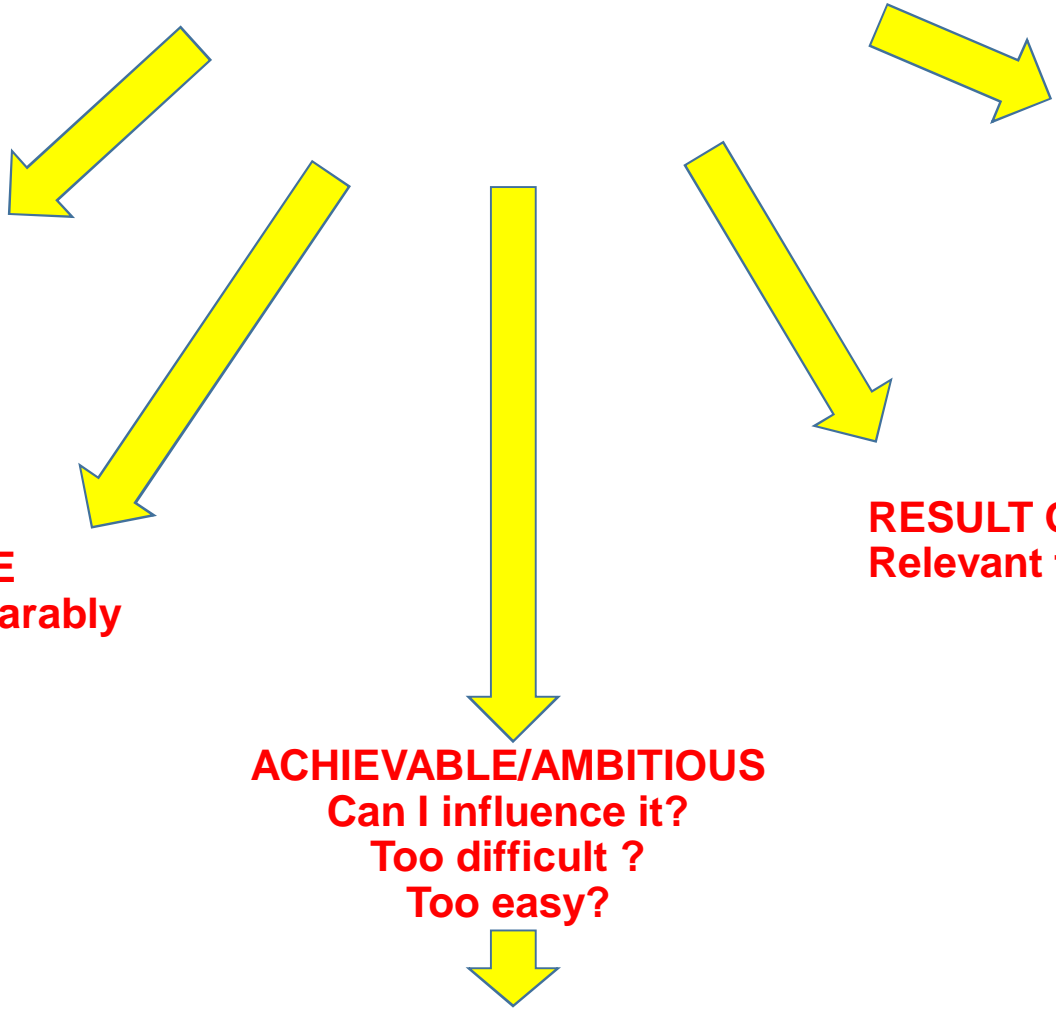
**SIMPLE**  
To be understood

**MEASURABLE**  
Clearly, comparably

**ACHIEVABLE/AMBITIOUS**  
Can I influence it?  
Too difficult ?  
Too easy?

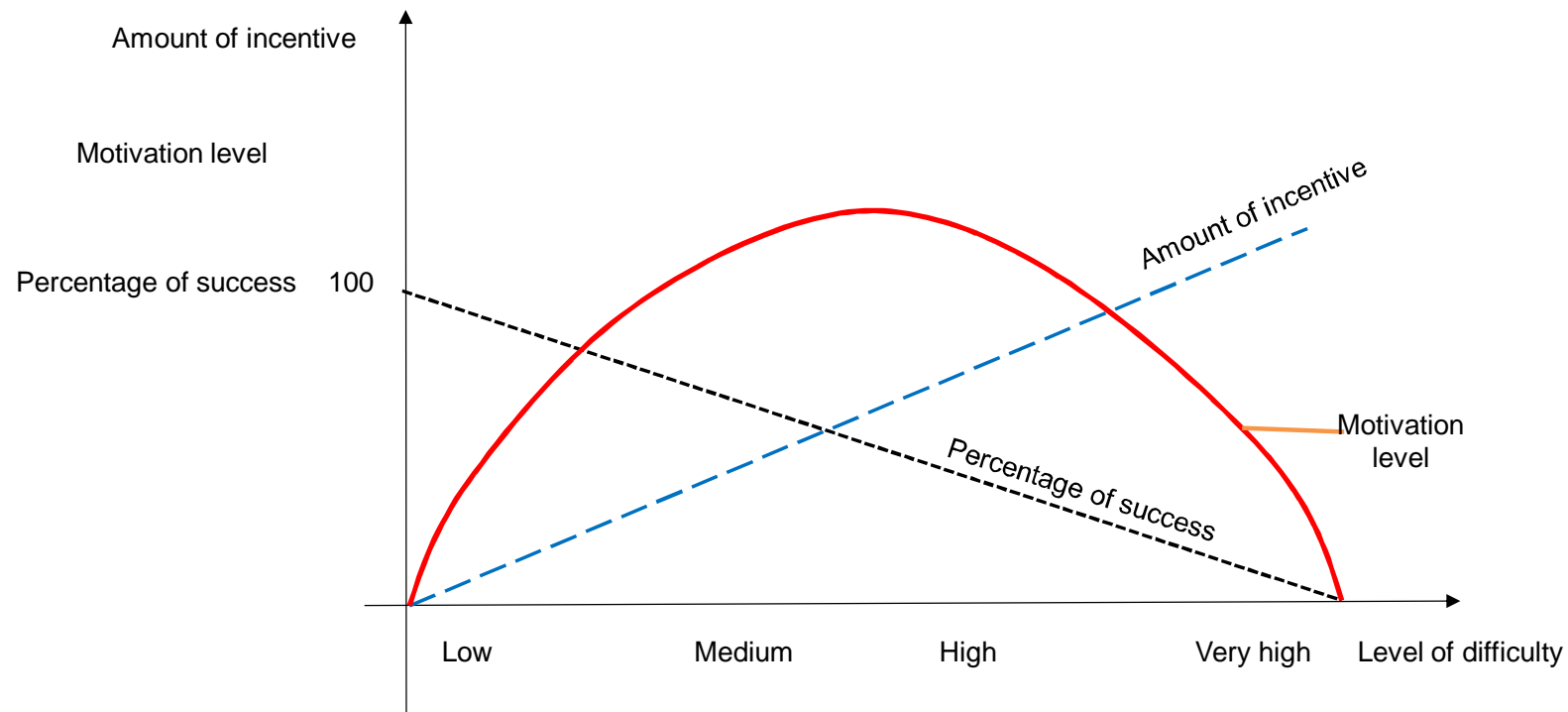
**TIMELY**  
Simply on time

**RESULT ORIENTED**  
Relevant for the activity



# OBJECTIVES

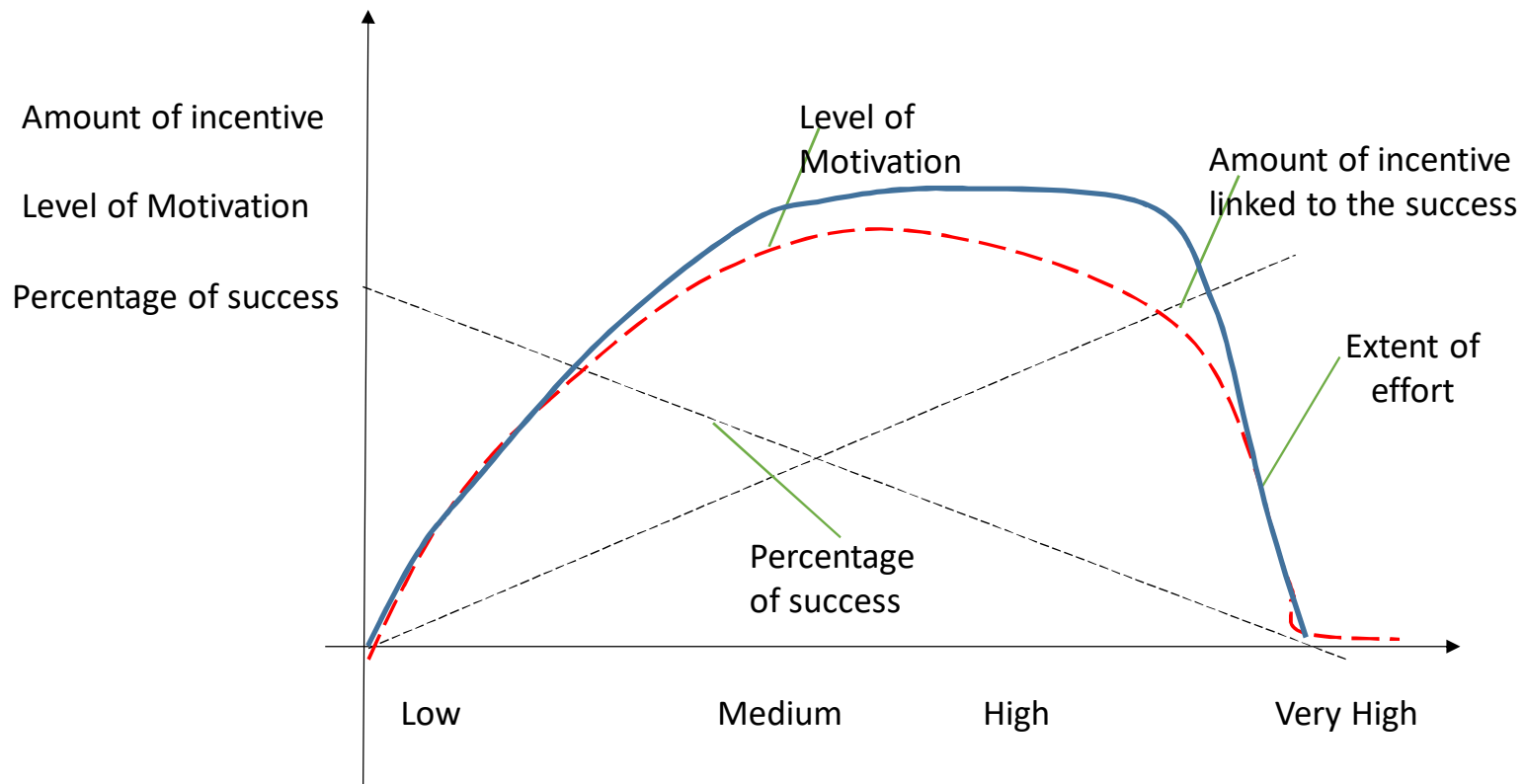
## ACHIEVABLE / AMBITIOUS



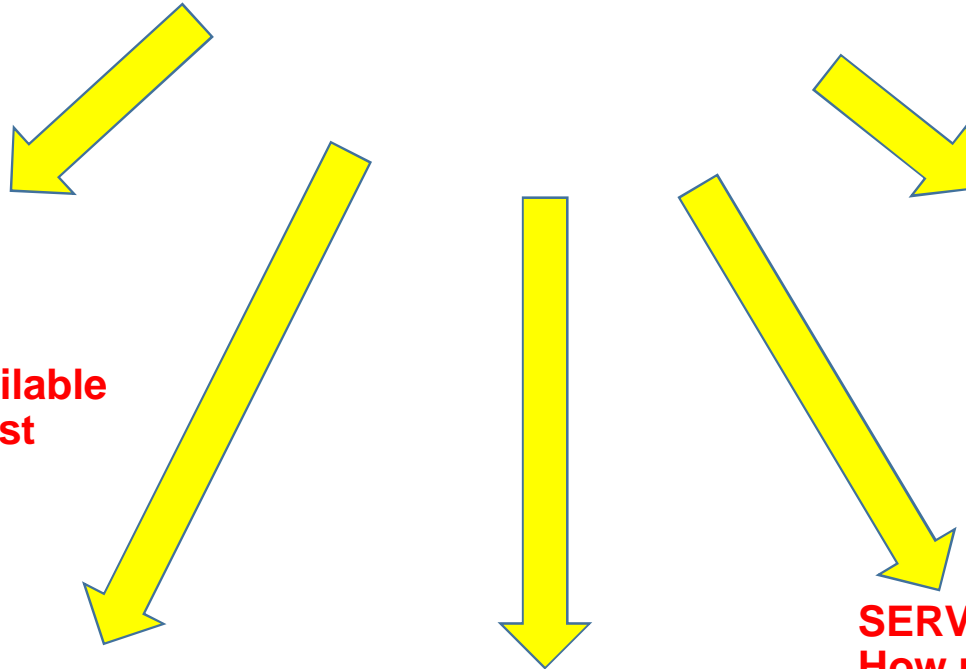


# OBJECTIVES

## ACHIEVABLE



## GROUPS OF OBJECTIVES



**PRODUCTIVITY**  
The way the productive system is using the available resources within the cost targets

**QUALITY**  
Level of adherence to the standard

**SAFETY**  
Ability to use the productive resources without accidents for the utilisers

**SERVICE**  
How much the system is able to satisfy the customers requests?

**FLEXIBILITY**  
Capacity of the system to comply with the demand of the market

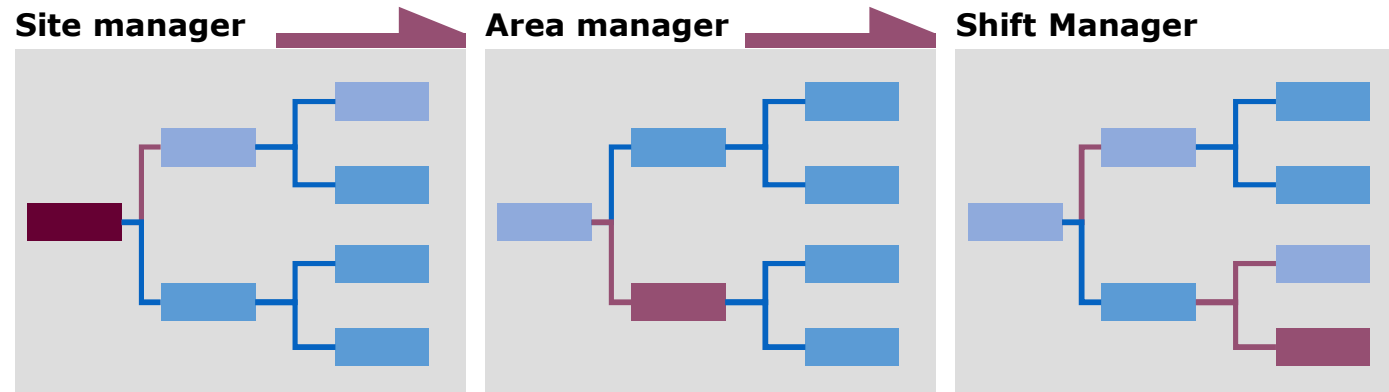


## OBJECTIVES

### examples

Ability to use resources	Ability to satisfy the requests	Performance Indicators Groups
<ul style="list-style-type: none"> <li>- Efficiency to use manpower</li> <li>- Efficiency to use Materials</li> <li>- Efficiency to use the machinery</li> <li>- Efficiency to use financial resources</li> <li>- í í í í ..</li> </ul>		<b>Productivity</b>
	<ul style="list-style-type: none"> <li>- Quality of Product Development</li> <li>- Compliance to the technical specifications</li> <li>- Quality by the Customer</li> <li>- Failure rate</li> <li>- Easiness to maintain the product</li> <li>- í í í .</li> </ul>	<b>Quality</b>
	<ul style="list-style-type: none"> <li>- Delivery quickness</li> <li>- Delivery Punctuality</li> <li>- Delivery Compliteness</li> <li>- Delivery Reliability</li> <li>- Delivery Flexibility</li> <li>- Time to market</li> <li>- Customer support</li> <li>- í í í í ..</li> </ul>	<b>Service</b>
	<ul style="list-style-type: none"> <li>- Lead time</li> <li>- Flexibility to the productive volumes variation</li> <li>- Flexibility to the mix variation</li> <li>- Flexibility to the products variation</li> <li>- í í í í í</li> </ul>	<b>Flexibility</b>

# KPIs ARE NOT THE SAME IN THE ORGANIZATION



## Productivity

Site Man-hour/Site output units

Area Man-hour/Area output units

Shift Man-hour/shift output units

## Scraps

Scrapped parts rate in the site (%)

Scrapped parts rate in the area (%)

Scrapped parts rate in the shift (%)

## Use of industrial facilities

Full capital utilised per output unit (€/unit)

OEE for key machine (%)

Shift Output vs. standard output

## Quality

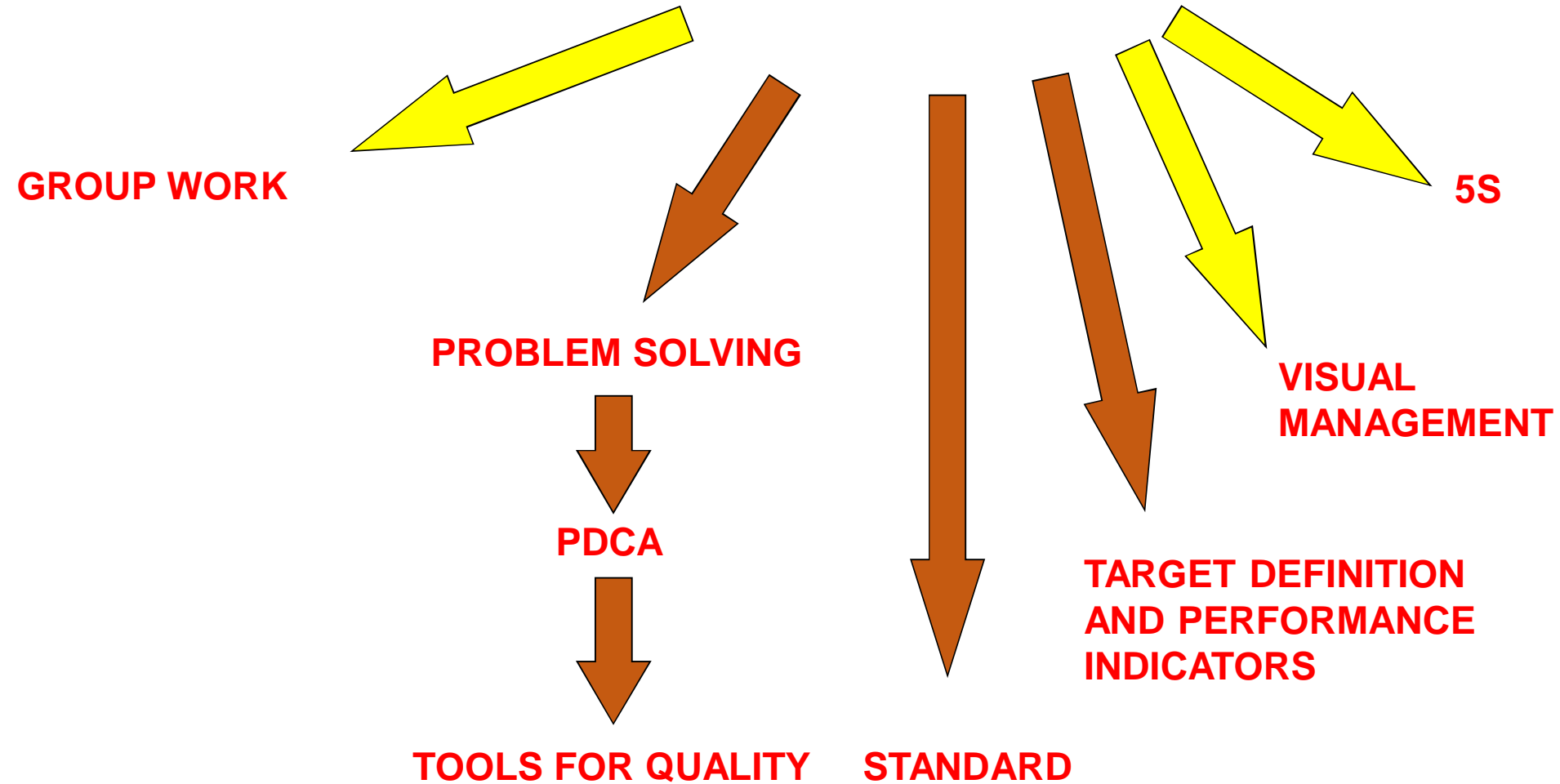
Defects per unit per site

Defects per unit per area

Defects per unit per shift

**Aggregate measurements up to the top level**

# CONTINUOUS IMPROVEMENT



# VISUAL PERFORMANCE MANAGEMENT

**Visual management is a company system of effective communication to make evident waste areas in order to fix corrective actions**

# VISUAL MANAGEMENT

## Why Visual Management?



# VISUAL MANAGEMENT EXAMPLES







## VISUAL MANAGEMENT EXAMPLES



**Clear indication of the folders' right position in the shelf**



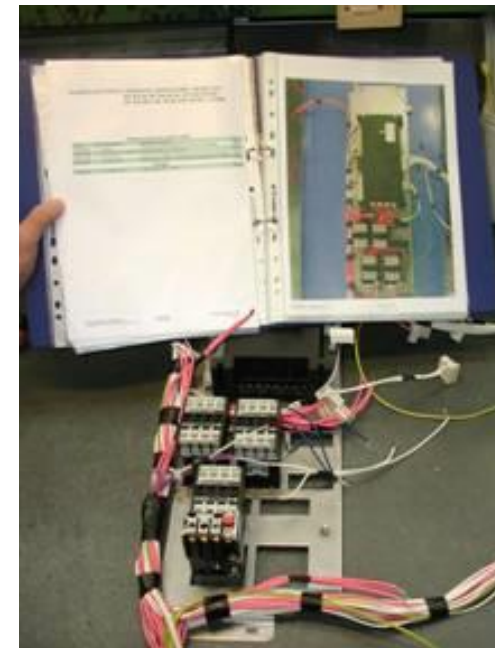
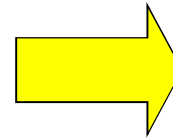
**Clear indication of the tools position.**

# VISUAL MANAGEMENT EXAMPLES

## Process instruction



BEFORE: Reference, unofficial document as process instructions for an electric panel assembly



AFTER: Catalog with part list, electric scheme and pictures for assembly and sample



# VISUAL MANAGEMENT EXAMPLES

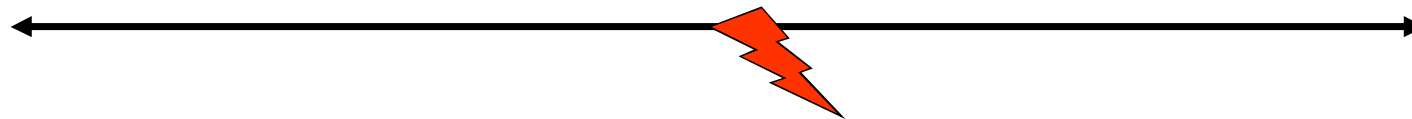
## Colour codification



**A simple colored scheme can limit the possibility to do mistakes.**

# VISUAL MANAGEMENT EXAMPLES

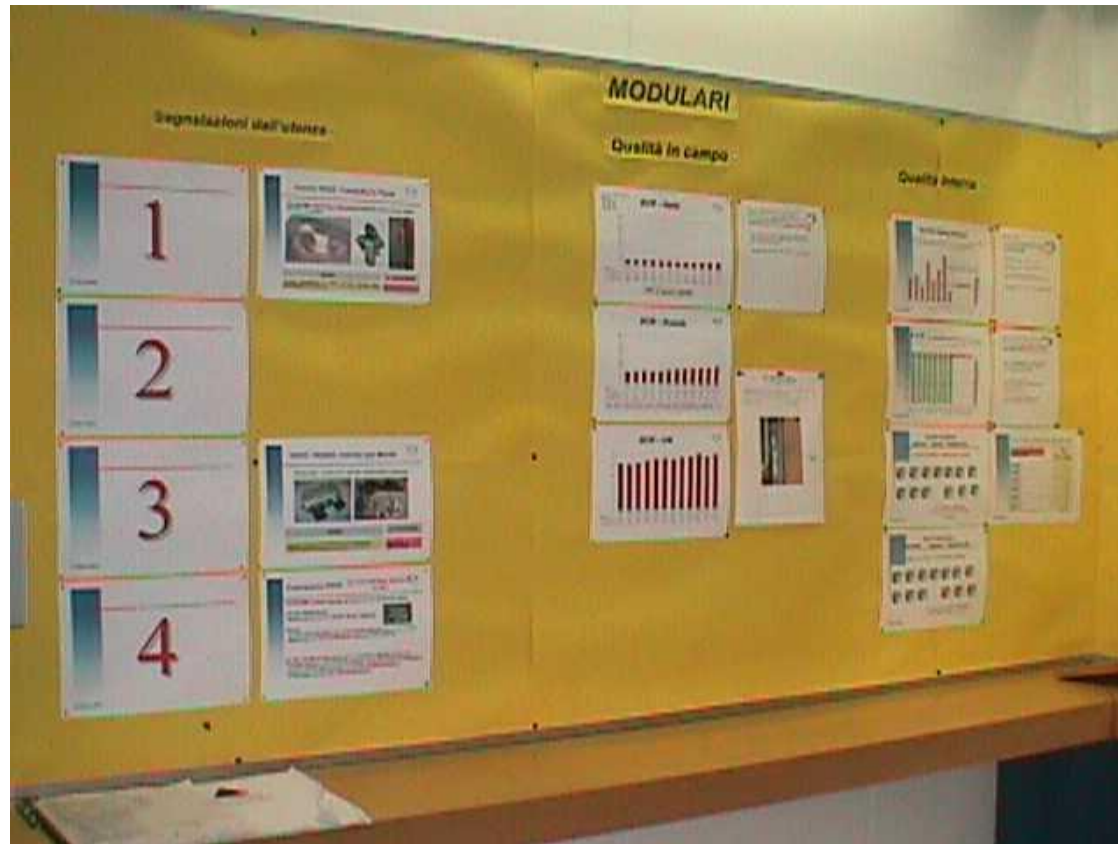
Colour codification



**It's time to change  
the lubricant...**

# VISUAL MANAGEMENT EXAMPLES

## Board





Materiale riservato  
Raffaele Campanella

# VISUAL MANAGEMENT BENEFITS

## A working visual management system allows to ...

- ... Show the position of every object
- ... Communicate process standard
- ... Display the production status
- ... Present performance information
- ... Enhance possible deviations from standard
- ... Inform on changes and improvements
- ... Get the root causes of problems



## ... getting tangible advantages

- Get better process reliability
- Sustain operative improvements
- Involve the employees arising their motivation level

**5S**



## WHAT ARE THE 5S?

IT IS A WAY TO IMPROVE THE QUALITY OF WHAT WE  
DO AND TO GET A CLEAN AND TIDY WORK  
ENVIRONMENT  
BY ORGANIZATION, NEATNESS AND DISCIPLINE





## THE METHOD

- 1 <sup>a</sup> S	Seiri	<b>SORT</b>
- 2 <sup>a</sup> S	Seiton	<b>STABILIZE</b>
- 3 <sup>a</sup> S	Seiso	<b>SHINE</b>
- 4 <sup>a</sup> S	Seiketsu	<b>STANDARDIZE</b>
- 5 <sup>a</sup> S	Shitsuke	<b>SUSTAIN</b>



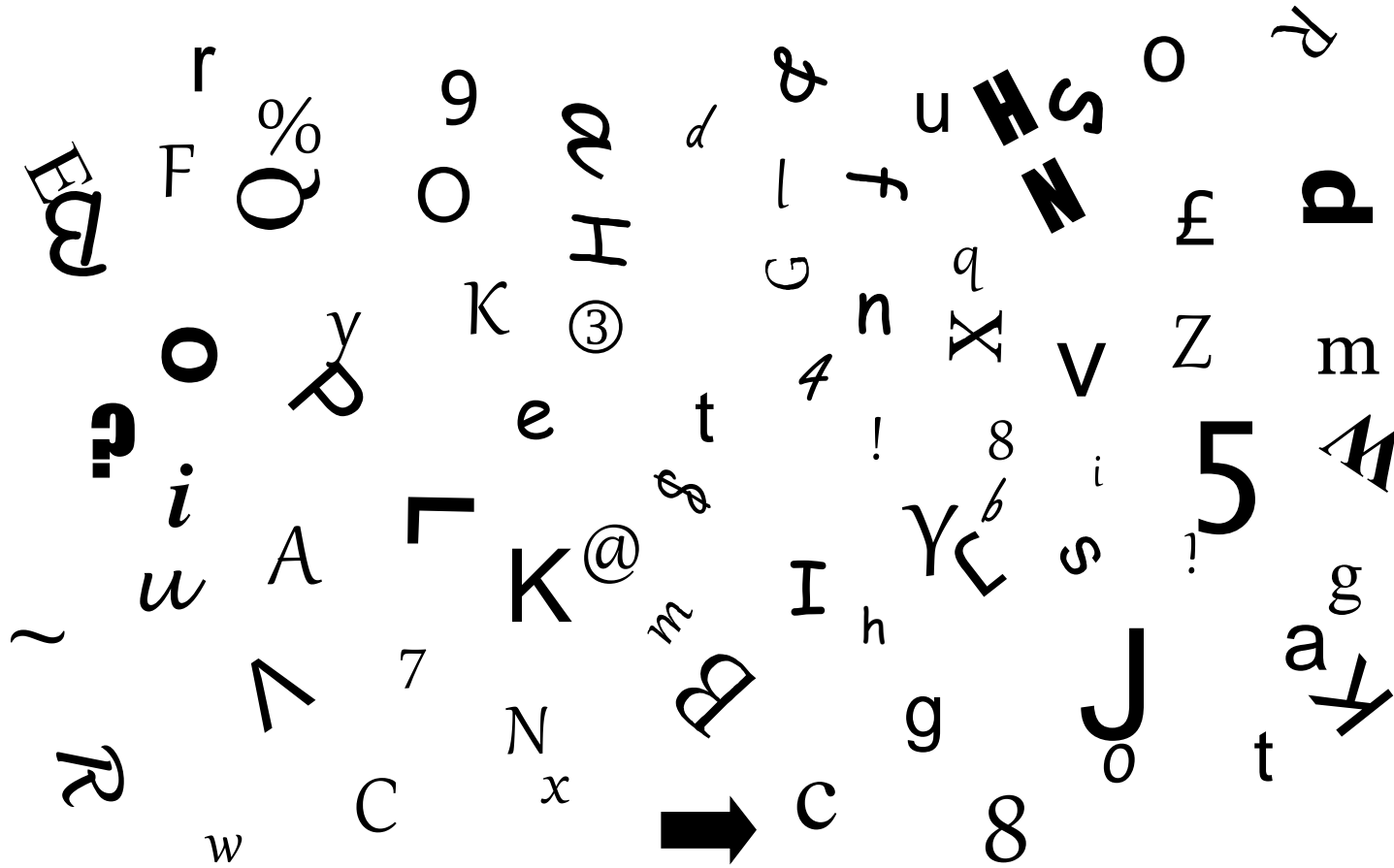
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Materiale riservato  
Raffaele Campanella

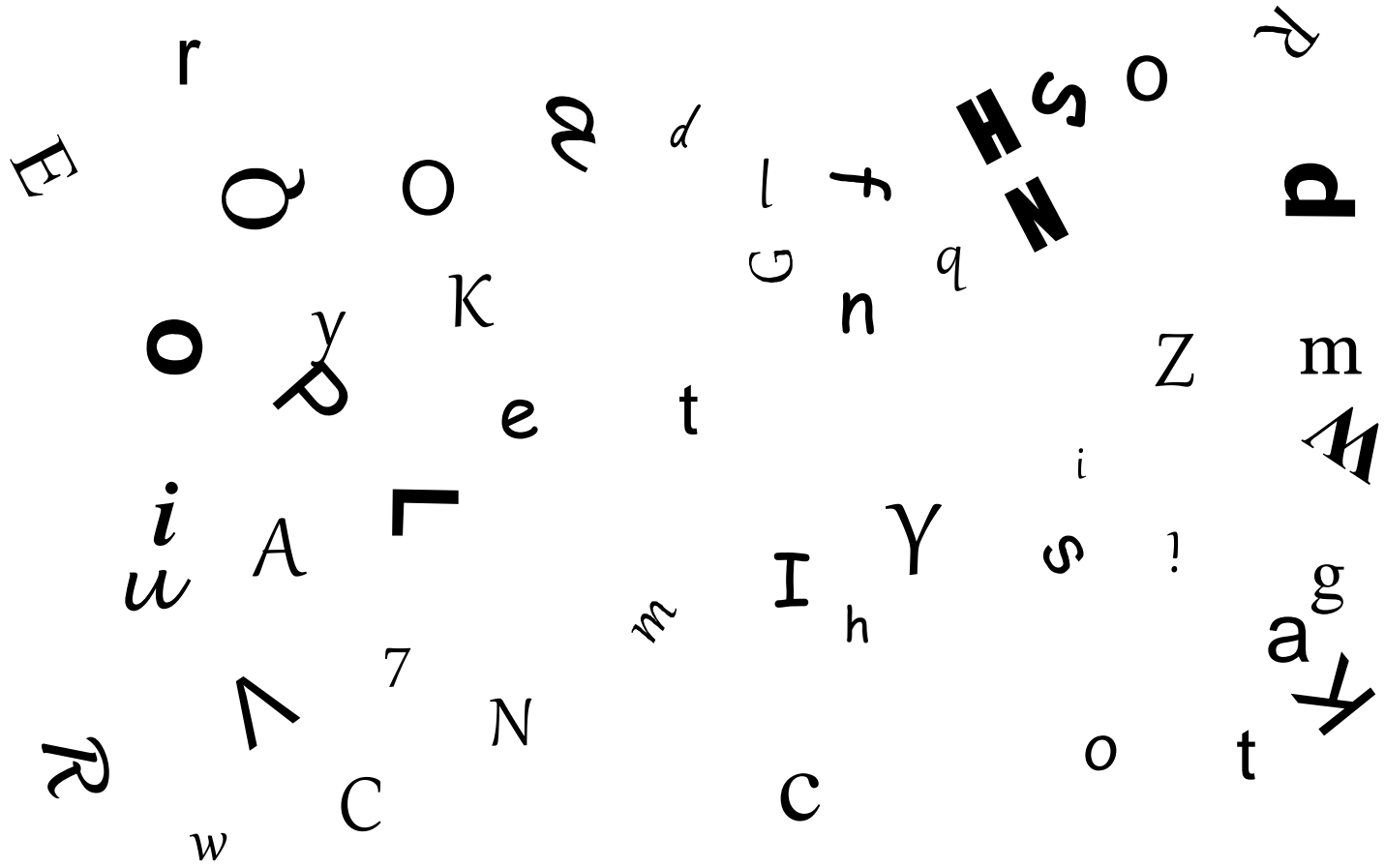
# A typical work place

Please circle the letters necessary to compose the words: **POSTAZIONE DI LAVORO**  
Raise your hand when the job is completed



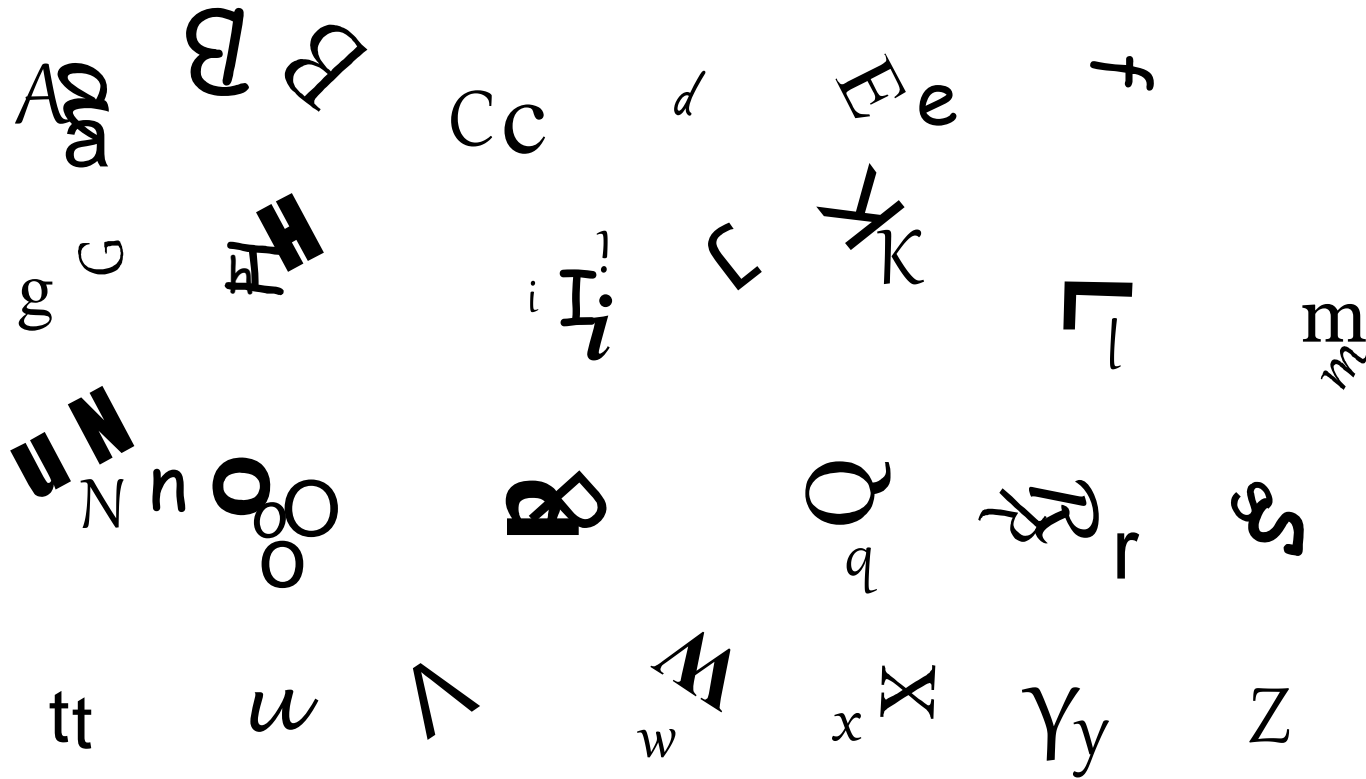
# Step 1 Ę Ę SeiriĘ (sort)

Please circle the letters necessary to compose the words: Ę POSTAZIONE DI LAVOROĘ  
Raise your hand when the job is completed



## Passo 2 È Í SeitonÎ (stabilize)

Please circle the letters necessary to compose the words: Í POSTAZIONE DI LAVOROÎ  
Raise your hand when the job is completed



## Step 3 Ę Ę SeisoĘ (shine)

Please circle the letters necessary to compose the words: Ę POSTAZIONE DI LAVOROĘ  
Raise your hand when the job is completed

Aa B Cc d Ee f  
gG H i i I J Kk LL Mm  
NnNn Oo p P Q Rr s S  
tt u v w W x y z

## Step 4 Ę Ę SeiketsuĘ (standardize)

Please circle the letters necessary to compose the words: Ę POSTAZIONE DI LAVOROĘ  
Raise your hand when the job is completed

A A	b	c	D	E	f	g
h	I I	j	k	L	m	N
O O O O	P	q	R	S	T	u
V	w	x	y	Z		



## Step 5 Ę Ĩ ShitsukeĨ (sustain)

Please circle the letters necessary to compose the words: Ĩ POSTAZIONE DI LAVOROĨ  
Raise your hand when the job is completed

POSTAZIONE  
DI  
LAVORO

# **SORT**

**The first operation is to check everything is useful in that workplace, considering the use frequency as well. In this way you understand what really is necessary.**

**If you do not do this, you get:**

- “ Drawers, cupboards, and tool boxes full of stuff**
  - “ Tools and equipment mixed together**
  - “ Inadequate quantities of material**
- 
- “ Keep only the things you need in the workplace and in the correct quantity.**
  - “ Classify what is useful in the workplace, removing all that is unnecessary**

## STABILIZE

The second activity to be done is to identify everything that needs and can make easy the work and to find the suitable place for them.

If you do not do this, it happens:

- " Loss of tools and equipment. Asking for another one is easier.
- " Non-functional lockers and warehouses.
- " Places not accessible.
- " The identity of the equipment/tool is lost if not identified.

Location and identification of materials:

- " Everything has a name and it is identified;
- " Everything has a precise location.
- " Everyone must know the exact location of the objects.

Functional layout:

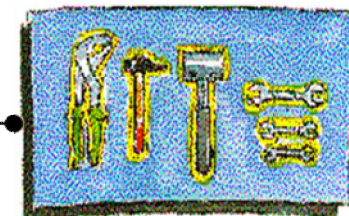
- " According to the same type of material
- " According to the frequency of use;
- " Depending on the tool set



Often used  
or light

rarely used  
or heavy

Always used  
- hanged





## SHINE

The third operation is the general cleaning of the workplace and the environment in which it is located; in fact, dirt is everything that:

- " interferes,
- " blocks,
- " corrodes,
- " damages the environment and people.

Regular cleaning ensures:

- " A healthy environment.
- " Quality of products and equipment.
- " Safety.
- " Highlighting what is out of place
- " Highlighting of dirt

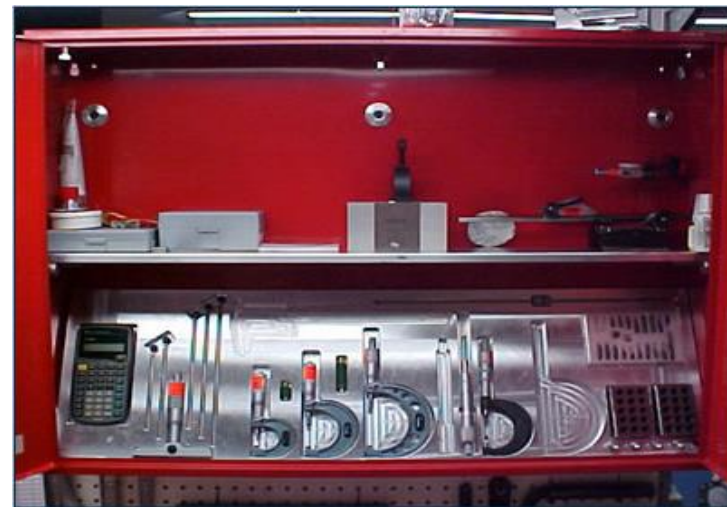


Cleaning can have a corrective and preventive function toward faults (see TPM).

# STANDARDIZE

- Lines for delimiting workstations and material storage
- Identification and location of all equipment
- Identification by labeling tools and materials for the set-up
- Danger and safety signs
- Operational practices
- Instruction sheets
- Labels

.....



## SUSTAIN

**Tis is the most difficult part of the 5S process to be done and kept for a long time until the next change of standard.**

- " REGULARITY**
- " CONTINUITY**
- " CONSTANCE**
- " NO DEROGATIONS**





## PRATICALLYÅ

**How to lead an event 5S by practical steps:**

- 1. Identify the area to be studied (operations, warehouse, delivery dept., other depts.)**
- 2. Divide the area into zones appointing the pertinent responsables (group leader)**
- 3. define the group, its composition and pertinent responsibilities**
- 4. define the 5S checklist and the standard module for the audits**
- 5. define the way and the calendar to make the audits**
- 6. Realize the information board for 5S program**
- 7. Do the 5S**
- 8. Identify the pertinent improvement actions**
- 9. Do the improvement actions**

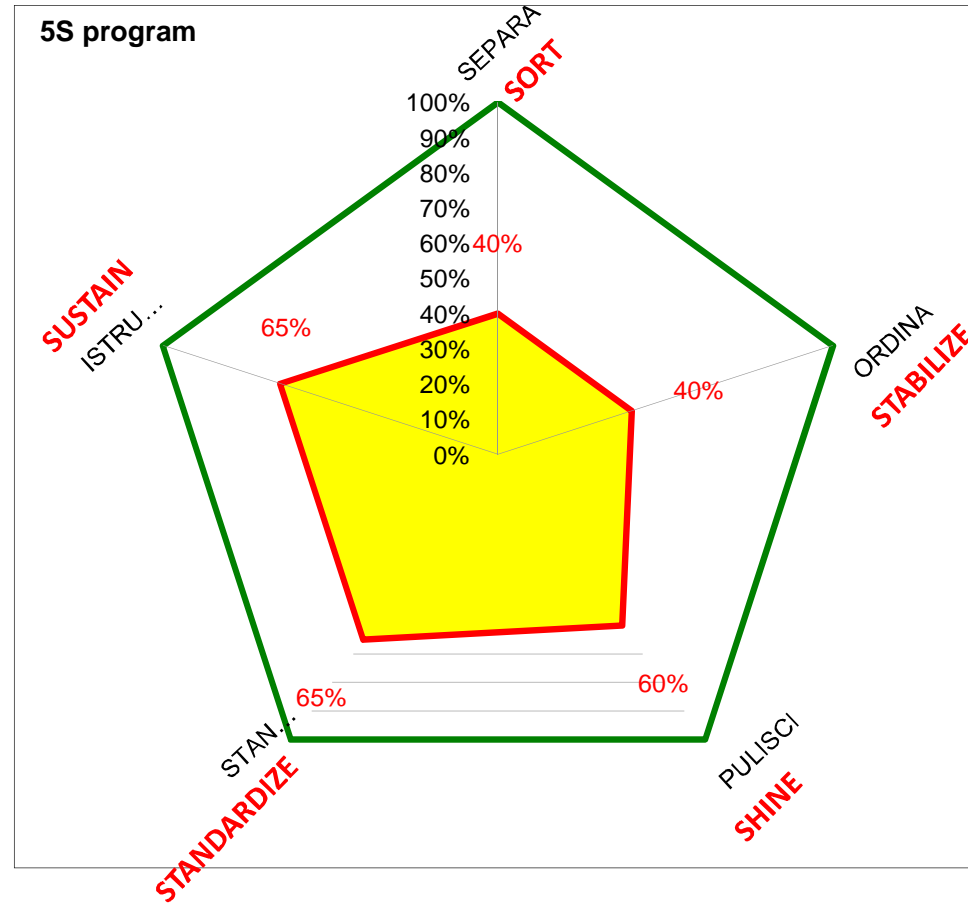
## BEFORE STARTINGÅ

### To be successful implementing 5S:

- involve strongly your employees
- make sure that employees understand the 5S system
- make sure that employees understand the importance both for them and for the company;
- start with a pilot phase and extend the approach to the remaining areas;
- an effort by everyone is required in the initial stages to be able to appreciate the real benefits
- managers must sponsor and support strongly the activity;
- make sure that employees understand clearly their responsibilities;
- make sure that the process is as visual as possible;
- connect the 5S program to all other Kaizen activities (for example SMED, TPM etc.);
- Integrate the 5S program with the safety program.



## EVALUATION SYSTEM BY RADAR DIAGRAM





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**Leader:**

**Auditors :**

**Audit Date :**

## EVALUATION SYSTEM CHECK LIST

		Lunedì	Martedì	Mercoledì	Giovedì	Venerdì	Week-end	Trend	Note
UFFICIO	1	Sul pavimento non ci sono materiali fuori posto (Carte, scatole, pallet...) ed è pulito (non ci sono tracce di grasso, acqua, rifiuti...). I muri sono puliti.							
	2	Il materiale d'ufficio è correttamente archiviato e conservato, ed etichettato. Per es. il toner per fotocopie è tenuto in un armadio definito e etichettato.							
ATTREZZATURE COMUNI	3	Tutte le attrezzature e le stanze che le contengono sono pulite ed in buone condizioni (ad es. stampanti, fotocopiatrici...)							
	4	Armadi, scaffali sono in ordine e contenitori di documenti sono impilati correttamente, in ordine, etichettati e identificati, secondo regole note.							
SCRIVANIE	5	Scrivanie e piani di lavoro sono pulite e ordinate quando l'impiegato finisce il lavoro. I PC sono spenti e protetti.							
	6	Effetti personali (vestiti, scarpe, cartelle, borsette...) sono conservate correttamente.							
IMPIEGATI	7	L'Ergonomia è rispettata: posizione di lavoro corretta, attrezzature di lavoro in buone condizioni, pulite e ben mantenute.							
	8	Le persone appartenenti o no all'ufficio rispettano le 5S e gli standard. Gli oggetti sono tenuti nei posti concordati e indicati.							
DOCUMENTI/ INFORMAZIONI	9	Tutte le necessarie informazioni comprese le istruzioni sul lavoro e le comunicazioni del Bouard sono visibili, aggiornate e chiaramente indicate.							
	10	Materiali riservati e obiettivi sono chiaramente indicati. Gli obiettivi sono chiaramente indicati. Gli obiettivi sono chiaramente indicati e gestiti. Le azioni sono monitorate e in tempo.							

Materiali riservati e obiettivi sono chiaramente indicati. Gli obiettivi sono chiaramente indicati e gestiti. Le azioni sono monitorate e in tempo.



<b>Leader:</b>					
<b>Auditor :</b>					
<b>Data Audit :</b>					

# SISTEMA DI VALUTAZIONE CHECK LIST

			Lunedì	Martedì	Mercoledì	Giovedì	Venerdì
Isola / Settore	1	Il pavimento: Non ci sono articoli fuori posto (Cartoni, pallette, ecc) ed è pulito (no sporco, niente a terra, niente grasso, etc.)					
	2	Prodotti per la pulizia e manutenzione sono disponibili e identificati, stoccati in apposite zone di sicurezza. Attrezzi per la pulizia hanno e sono in una zona dedicata					
Isola / Settore	3	Le regole dell'ergonomia sono rispettate : le posizioni di lavoro sono corrette, attrezzi sono in buone condizioni, puliti e ben mantenuti.					
	4	Macchinari ed attrezzi sono sicuri. Le targhette sono osservate. Gli armadietti per gli attrezzi sono puliti ed ordinati					
Operatore	5	Tutti gli operatori (PV) ed il personale di supporto in linea (NPV) e le funzioni di supporto sono stati formati e certificati (o in progresso).					
	6	I dispositivi di protezione (DPI) sono usati dove richiesto e in buone condizioni.					
Prodotto	7	Le regole MADC sono rispettate: Le carte Kanban non si perdono e sono in buono stato generale. Il percorso dei trenini e le regole di allocazione dei materiali sono rispettate					
	8	Non ci sono aree con parti inutilizzate (attrezzi, documenti), non c'è un WIP eccessivo e le ubicazioni designate sono rispettate.					
Docuemnti/Info	9	Tutti i documenti necessari (Dossier Metodo e schede di sicurezza) sono disponibili, le modifiche visibili e nelle loro ubicazione designate.					
	10	Sicurezza (Salute ed ergonomia) e 5S sono gestiti quotidianamente in AIC (ciclo 1): i piani di azione sono completati in tempo					
<b>0</b>		<b>TOTALE</b>					



# SISTEMA DI VALUTAZIONE CHECK LIST

Example of standard Check list that helps to keep the right position of the tools/materials and the cleaning of the ambient and the machines (included some small maintenance activities done by the operator

Department: .....

Machine: .....

Done by: .....

Issue date: .....

Signed by : .....

Procedure for evaluation of order keeping and ambient cleaning to be carried out at the end of every shift:

- 1) Place all tools and equipment on the appropriate place in the indicated position and checking if there are missing items.
- 2) Clean ..... .. with .....
- 3) After removing the panels, clean with a jet of air ..... and with a rag .....
- 4) Remove the oil and greasiness from ..... Use a rag soaked in .....
- 5) Clean the panels..... using a rag soaked in .....,
- 6) Sweep up the floor processing residues
- 7) Check .....
- 8) Check the consumption of cutting tools ..... .. with .....
- 9) Clean measuring instruments with ..... .. Standard time = ..... ..Min.

To be carried out at the end of the day:

1. Evacuation of waste containers,
2. bring containers to the area... .. Standard time = ..... ..Min.

To be carried out every x days:

- 1) .....

To be performed at the weekend

- 1) Oil change at: ..... .. Standard time = ..... .Min
- 2) Thorough cleaning of ..... .. Standard time = ..... .Min

To be carried out every ..... pieces worked

- 1) Tool change ..... Standard time = ..... .Min

# EXAMPLES

BEFORE



AFTER



**PROBLEM:** MATERIAL WITHOUT A FIXED LOCATION

**ACTIONS:** SUITABLE CONTAINER

FIX POSITION DEFINITE

## EXAMPLES



**PROBLEM:** SPACE OCCUPIED BY THE ROLL HOLDER

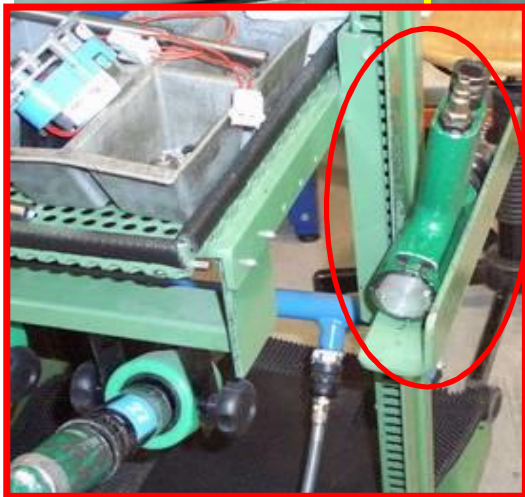
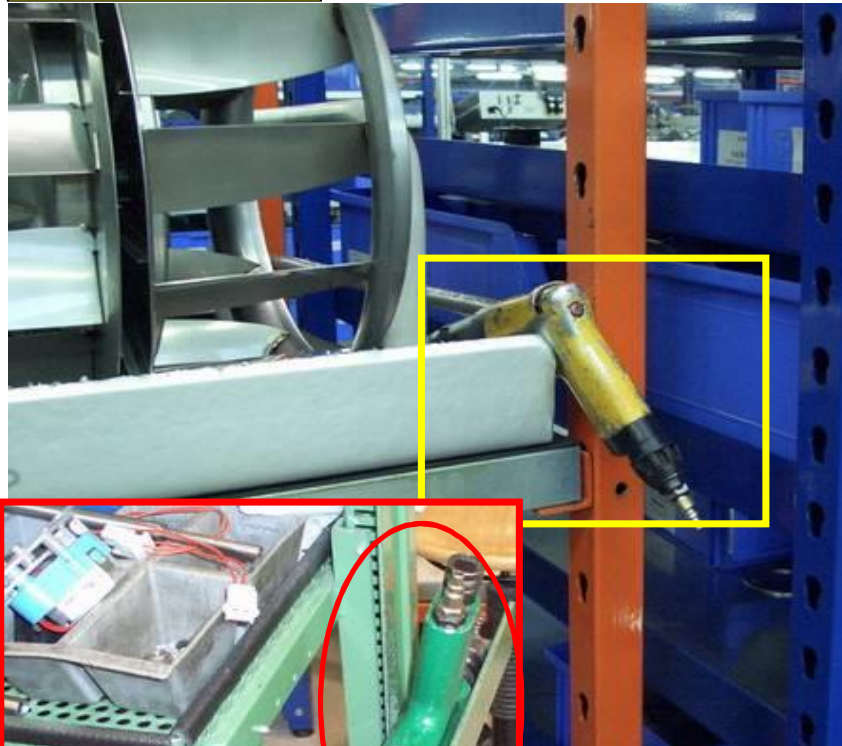
**ACTIONS:** NEW SUPPORT ATTACHED ON THE WORKBENCH





# EXAMPLES

BEFORE



AFTER



**PROBLEMA:** TOOLS WITHOUT RIGHT PLACE

**AZIONE:** ADDED TWO SUPPORTS ON THE WORK BENCH

# EXAMPLES

BEFORE



AFTER



**PROBLEM:** GASKETS POSITIONED IN UNTIDY WAY.

**AZIONS:** DESIGN AND CONSTRUCTION OF SUITABLE SUPPORTS





# EXAMPLES





# EXAMPLES

BEFORE



AFTER





# EXAMPLES

BEFORE



AFTER



# EXAMPLES

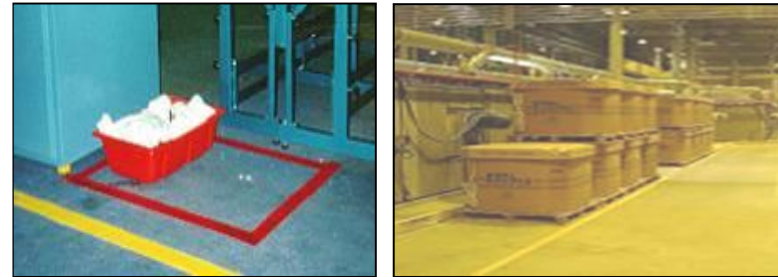


## EXAMPLES

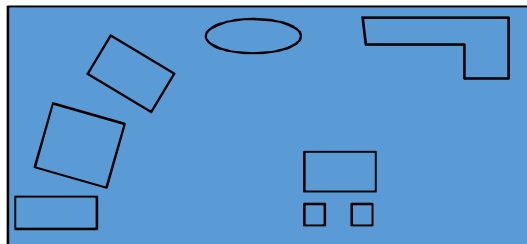
*INSTRUCTION BOARD*



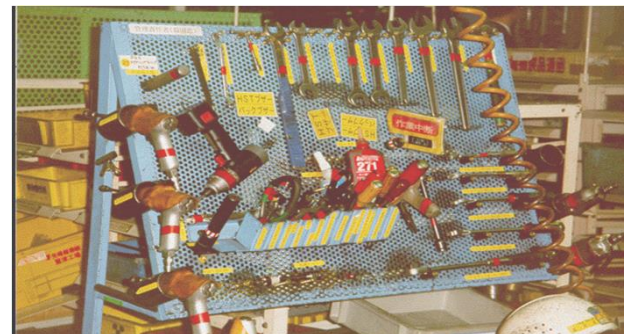
*LINES ON THE FLOOR*



*WORKPLAN -LAYOUT*



*TOOLS HOLDER WITH COLORED SIGNS*



# KAIZEN

**A KEY SUCCESS FACTOR IS  
THE GROUP WORK**

# ORGANIZATION

**WHO ARE THE MEMBERS OF  
A KAIZEN  
WORK GROUP?**

# WORK GROUP

## COMPETENCIES:

- BLUE COLLAR WORKER
- JOB LEADER (?)
- FORKLIFT DRIVER
- MAINTENANCE WORKER
- TIME AND METHODS SPECIALIST





## EG.: WORK GROUP



# WORK GROUP

**THE WORK GROUP PERFORMS WELL IF THERE ARE CERTAIN CONDITIONS:**

- **A good project leader/Chief Engineer/Project Manager**
- **Motivated members**
- **A culture of teamwork**
- **A project owner**
- **A suitable organizational structure**



# WORK TEAM

## DEFINITION:

**The work group (team) is a group of people belonging to different departments, with different professional skills, who meet and work together in a coordinated way, to address and solve one or more problems better than doing it individually.**

**The team is coordinated and controlled by a team leader, who works like the others, but also has the responsibility for the behavior and results of the entire team.**

**It is the place where professional values, autonomy and participation are enhanced and where the hierarchical structure is dropped to give space to free expression and ideas exchange.**

# WORK TEAM

## WHAT ARE THE WORK TEAM CHARACTERISTICS?:

- . To have common targets (eg. football team).
- . Each team member has responsible to act toward the target.
- . High level of communication and information sharing
- . High level of personal involvement
- . High level of motivation

**One of the conditions is to manage correctly the workteam meetings**

# WORK TEAM MANAGEMENT - 1

## THE MOST DIFFICULT AND IMPORTANT POINT IS THE STARTING ONE

- . Suitable choice of the members and the leader
- . Establish soon shared rules on internal behaviour
- . Establish how to make decisions
- . Consider listening as a value. Do not be arrogant
- . Establish roles within the group
- . Enhance the values of the group that have to be inspired and coherent with the company's ones.

# WORK TEAM MANAGEMENT - 2

## THENÀ À À ..

- . **Define the problem clearly**
- . **Be sure that the group has all the competencies**
- . **Establish a suitable measurement system of results**
- . **Define the targets according to S.M.A.R.T.**

# WORK TEAM MANAGEMENT È 3

## ONE MORE DIFFICULT POINT IS TO SUSTAIN ALONG THE TIME THE GROUP MOTIVATION

- . **Involve people and share the methods and the tools to be used**
- . **Work every time with data and facts**
- . **Use all the lean tools**
- . **Manage the possible internal conflicts**
- . **Assign responsibility and grant trust**
- . **Acknowledge the success and congratulate for the results**

# WORK TEAM MANAGEMENT È 4

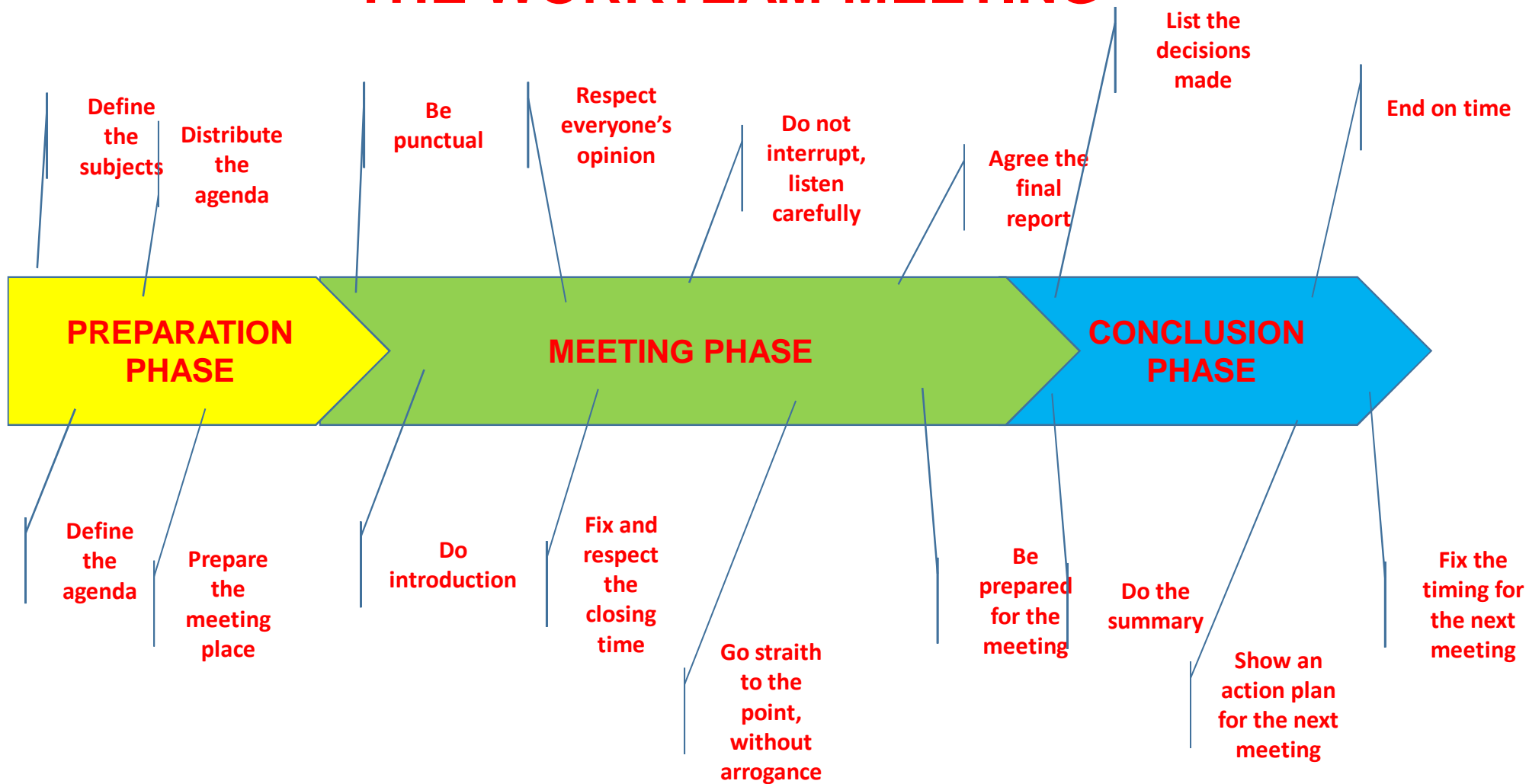
## HOW TO CLOSE THE PROJECT

- . **Compare the achieved results to the target**
- . **Identify possible remaining activities to end it**
- . **Document the job done and give maximum visibility to it**
- . **Celebrate the achieved goals**





# THE WORKTEAM MEETING

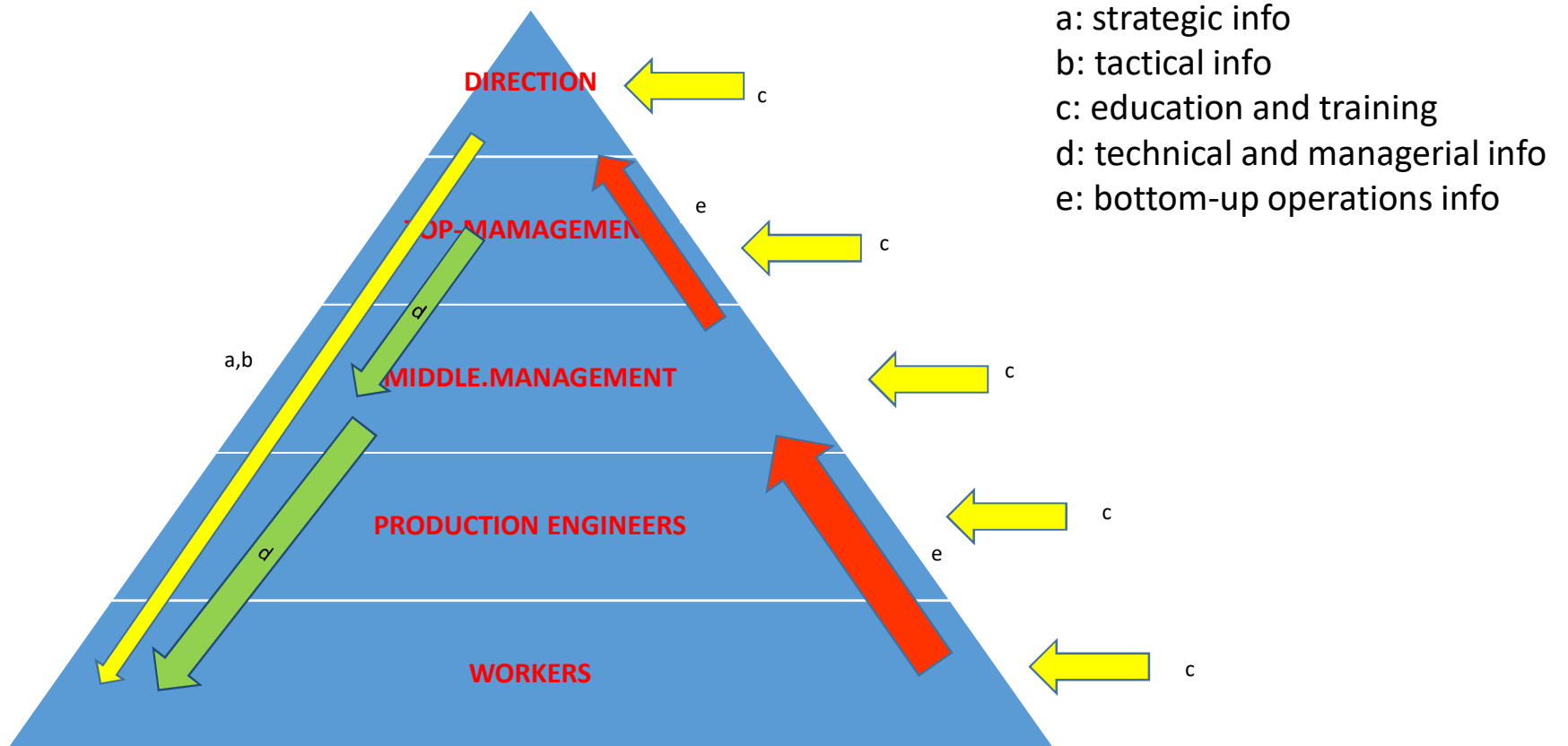




# SUMMARIZING THE MEETING CHARACTERISTICSÅ .

	THESEÅ	AND NOT THESEÅ
Relationships	<p><b>Productive work session:</b> focus on problems and their solution</p> <p><b>Challenge feeling:</b>. %Can we do better?+</p> <p><b>Responsibility delegation to the right employees</b> on the results of specific actions</p>	<p><b>A defensive session</b> where instead to look for the solution, the participants look for the guilty</p> <p><b>Acceptance of the present situation</b> (state AS.IS)</p> <p><b>Micro-management</b></p>
Process	<p><b>Find the time to read and comment the KPIs board.</b></p> <p><b>Focus</b> on gaps towards the targets</p> <p><b>Vital few for improvement</b></p>	<p><b>First look to the data</b> during the meeting</p> <p><b>Comment every single indicator</b></p> <p><b>No definite priority</b></p>
Contents	<p><b>Fact-based discussion</b> on root causes</p> <p><b>Clear ownership</b> of the corrective actions</p>	<p>Decisions based su <b>personal preferences</b> or feeling</p> <p><b>Limited ownership</b> without practical actions</p>

# INFORMATION FLOWS



# PROJECT LEADER

- GIVES THE GROUP CONTINUOUS STIMULATION AND MOTIVATION TOWARD THE RESULTS
- ORGANIZES THE GROUP'S ACTIVITY, DEFINING AND AGREEING ON THE OPERATIVE METHODS
- ASKS FOR INFORMATION, OPINIONS AND PROPOSALS
- PRAISES GOOD IDEAS AND RECOGNIZES THE PROPOSED SUGGESTIONS
- MODERATES THE DISCUSSION, ALLOWING TO ANYONE TO EXPRESS HIS OPINION
- MODERATES THE CONFLICTS, LOOKING FOR A WIN-WIN SITUATION
- MAKES THE SYNTHESIS OF THE WORK

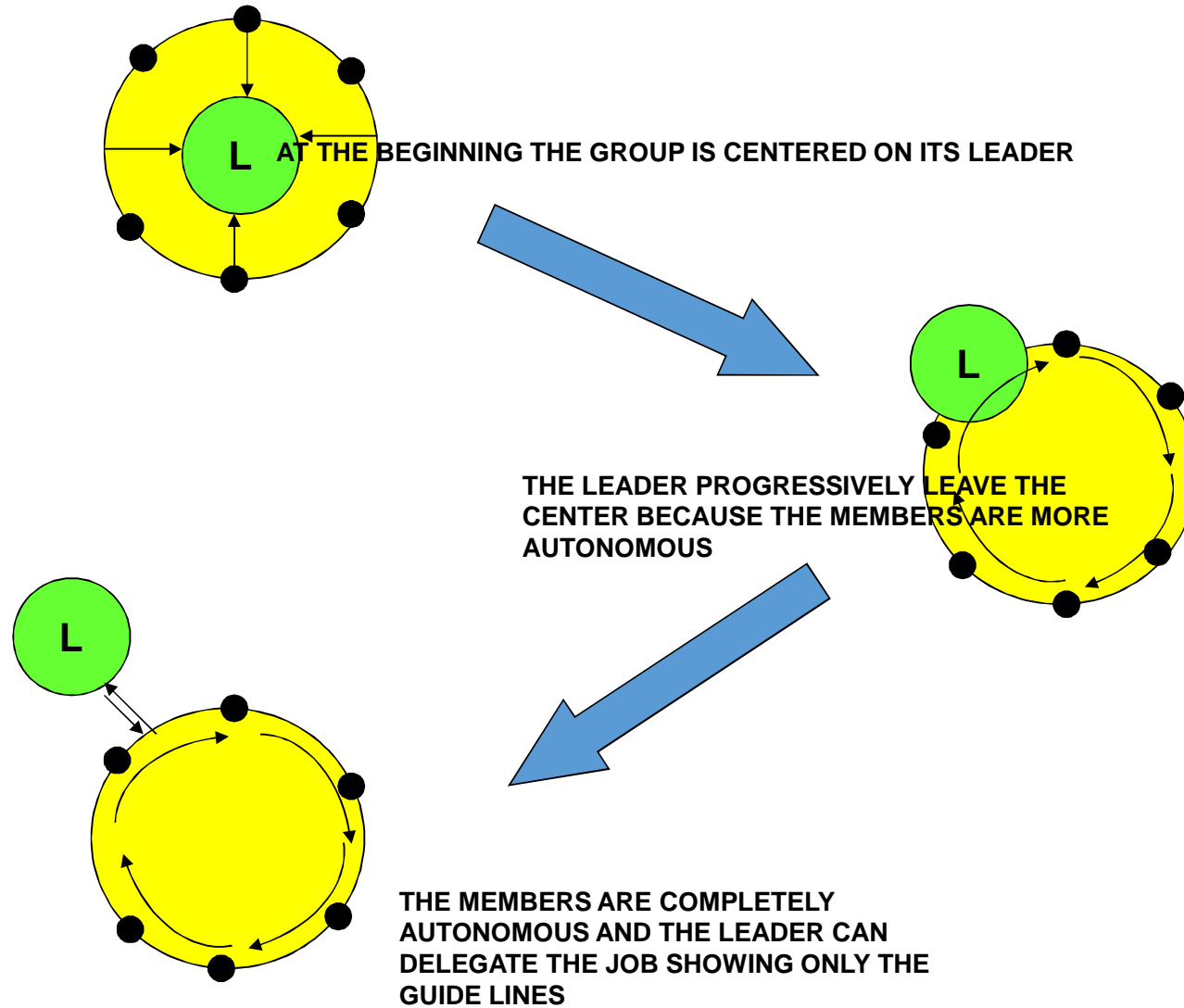
# PROJECT LEADER

## THE LEADER SHOULD:

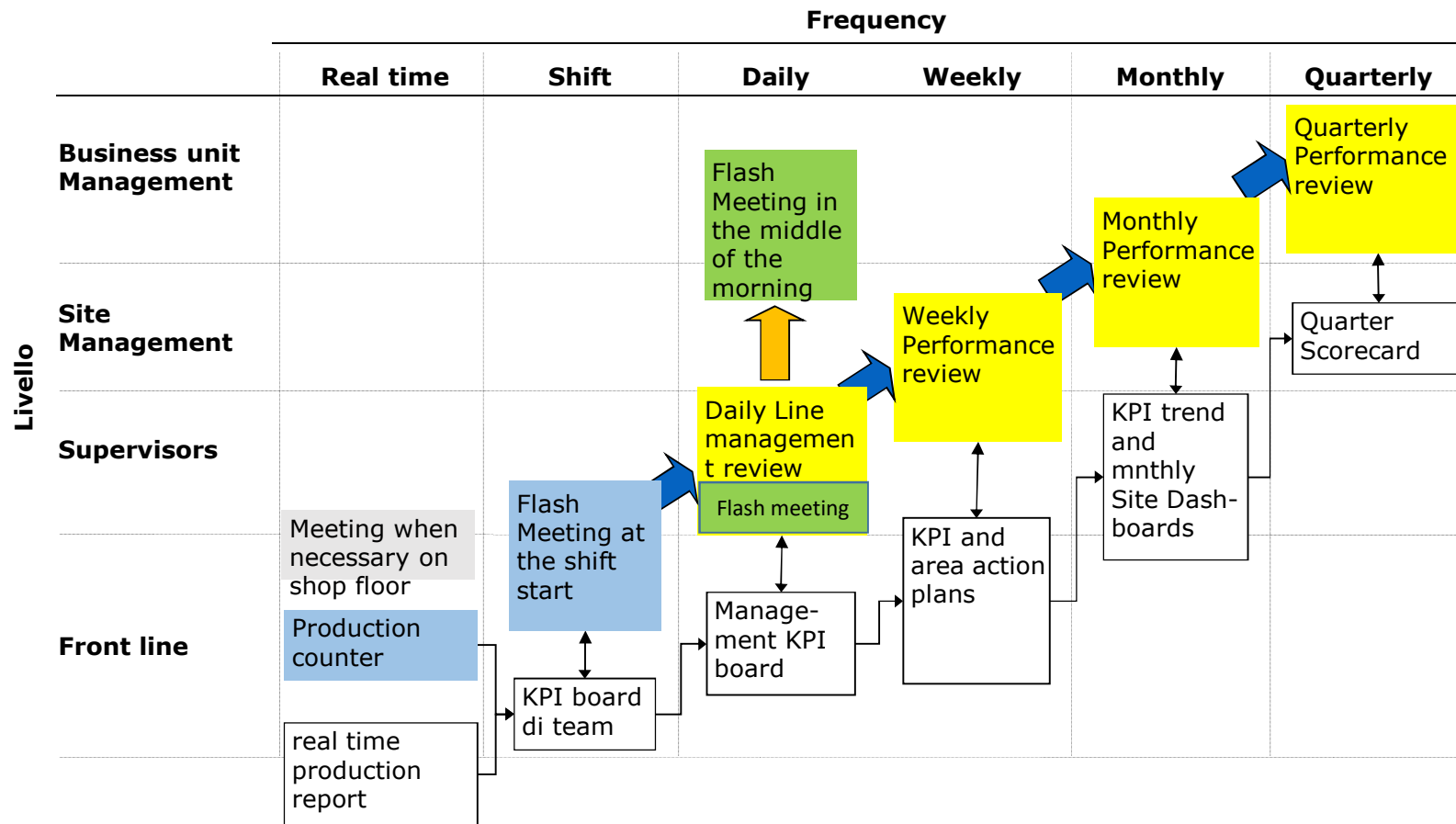
- KNOW DEEPLY CUSTOMERSNEEDS
- BE AN EXCELLENT TECHNICIAN
- KNOW DEEPLY HIS PRODUCT TECHNOLOGY
- BE INTUITIVE AND PRACTICAL
- BE CREATIVE / PROBLEM SOLVER / CONFLICT SOLVER
- BE DETERMINED
- BE DISCIPLINED / INTEGRATOR /MANAGER
- BE EASY COMMUNICATOR
- MOTIVATE HIS PEOPLE
- BE PATIENT
- BE WILLING TO CHALLENGE
- BE BRAVE AND AUDACIOUS

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# WORK LEADER



# PERFORMANCE REVIEW AND DAILY INFO



## FLASH MEETINGS

EXAMPLE

**5' meeting at the beginning of each shift** among supervisor and blue collars in front of "daily review board"

Led by supervisor

Employees help solving present problems

Solutions for small problems are promptly implemented

Daily problems are evident

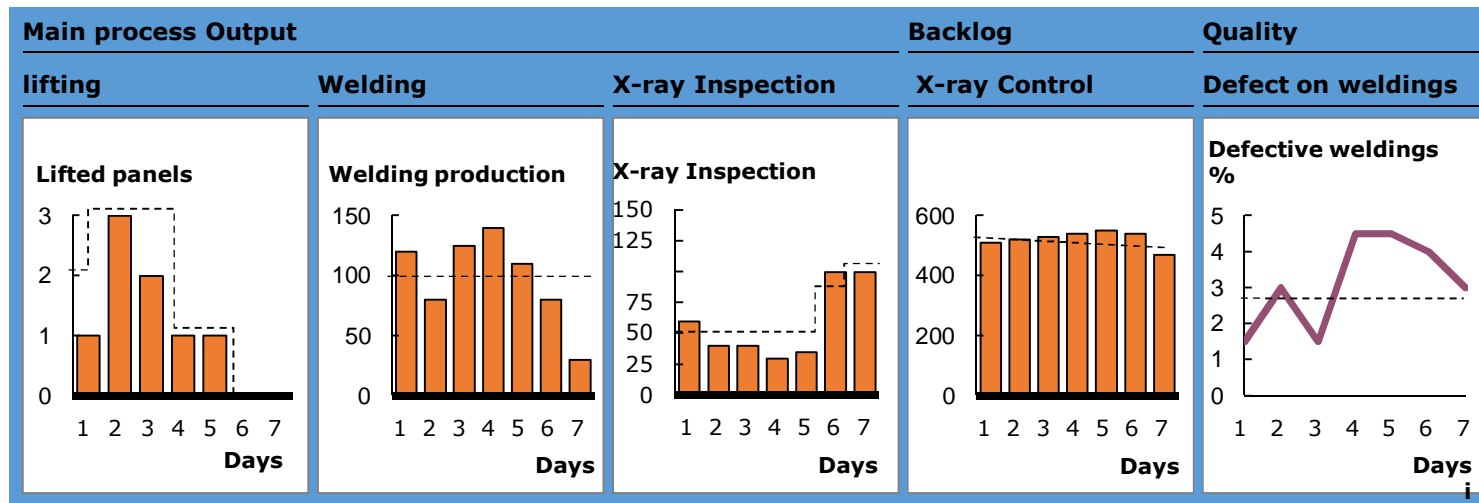




# 5D FLASH MEETING TYPICAL KPIs

OVEN WALL ASSEMBLY

EXAMPLE



# DAILY PERFORMANCE REVIEW MEETING

EXAMPLE

20' meeting among supervisor and manager of the Dept.



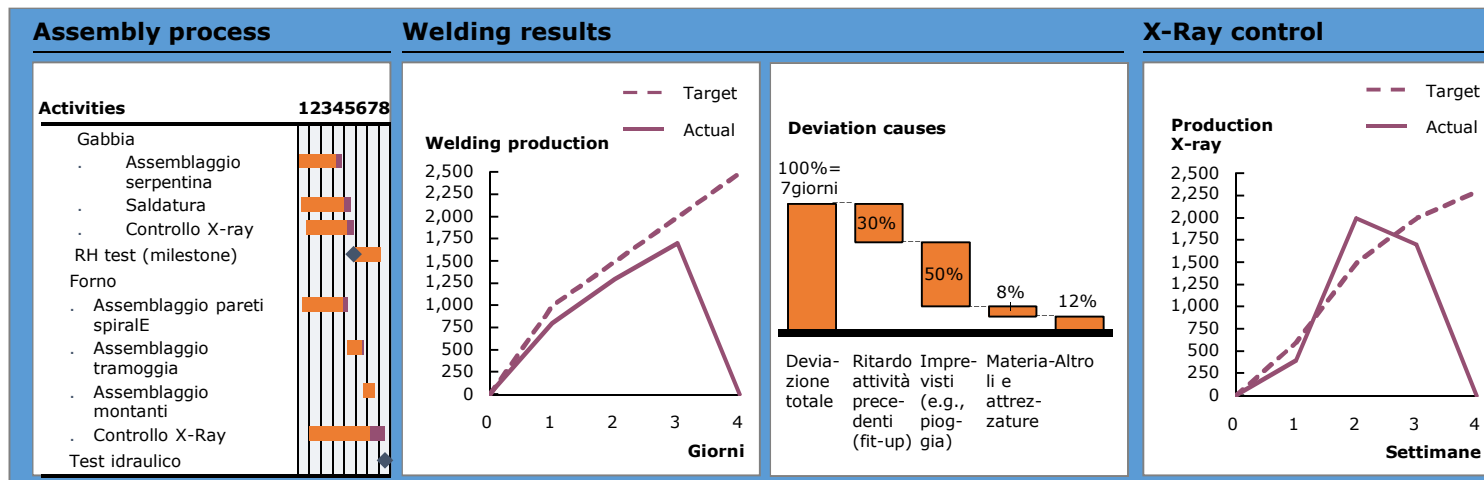
Daily performances are evident

The biggest problems are known by the upper management level

# EXAMPLE OF KPIs DISCUSSED IN THE DAILY/WEEKLY MEETINGS

OVEN WALL ASSEMBLY

EXAMPLES



# FOR A GOOD 5D MEETING, THE TEAM LEADER MUST ASK RIGHT QUESTIONS



## What happen?

- ~ What is the gap to the target?
- ~ What are the devians toward the standard?

## Why?

- ~ Have we clearly understood the root causes or do we have to investigate furtherly?

## What do we need to do?

- ~ Do we need an immediate action to face with the problem ?

## Who will do it?

- ~ Who will be responsible to implement the action?
- ~ Does the action responsible need an help from other team members?

## When will it be done?

- ~ Is this a top priority action?
- ~ What is the deadline for its completion (short term)?



<b>TECHNIQUES AND TOOLS</b>					<b>7 TOOLS</b>	<b>DATA COLLECTION SHEETS</b>	
						<b>STRATIFICATION</b>	
						<b>CORRELATION</b>	
						<b>PARETO'S DIAGRAM</b>	
						<b>ISTOGRAMS</b>	
						<b>CONTROL CHARTS</b>	
						<b>ISHIKAWA DIAGRAM</b>	
					<b>ONE POINT LESSON</b>		
					<b>A3</b>	<b>5 WHYS</b>	
					<b>KEY PERFORMANCE INDICATORS</b>		
					<b>5 S</b>		
				<b>YAMAZUMI</b>	<b>ANDON</b>	<b>FLASH MEETINGS</b>	
				<b>TAKT TIME</b>	<b>VISUAL MANAGEMENT</b>	<b>GROUP WORK</b>	
			<b>ERGONOMY</b>	<b>KANBAN</b>	<b>STANDARDIZATION</b>	<b>EMPOWERMENT</b>	
			<b>TPM</b>	<b>KAIKAKU</b>	<b>PDCA</b>	<b>INVOLVEMENT</b>	
			<b>SMED</b>	<b>JIT</b>	<b>POKAYOKE</b>	<b>AGREEMENT</b>	
		<b>SPAGHETTI CHART</b>	<b>OEE</b>	<b>HEIJUNKA</b>	<b>KAIZEN</b>	<b>INFORMATION</b>	
	<b>WASTES</b>	<b>LABOUR TIMES STUDY</b>	<b>ONE PIECE FLOW</b>	<b>FROM PUSH TO PULL</b>	<b>SIX SIGMA</b>	<b>COMMUNICATION</b>	
	<b>HOSHIN KANRI</b>	<b>CURRENT VMS</b>	<b>FUTURE VSM</b>	<b>PULL</b>	<b>JIDOKA</b>	<b>MOTIVATION RESEARCH</b>	
<b>PRINCIPLES</b>	<b>DEFINE THE VALUE</b>	<b>IDENTIFY THE VALUE FLOW</b>	<b>SET UP FLOW ACTIVITIES</b>	<b>MANUFACTURE PULLING THE PRODUCTION</b>	<b>RESEARCH PERFECTION</b>	<b>ATTENTION TO PEOPLE</b>	
<b>FOCUS</b>	<b>CUSTOMER</b>			<b>QUALITY</b>		<b>EMPLOYEES</b>	

# KEY MESSAGES

- “ **Leading a Company is like driving a car: you have to give direction and to manage the performance**
- “ **KPIs and objectives are necessary for performance management**
- “ **Visual management is the best communication system inside the company**
- “ **Kaizen works if the teams work**
- “ **Leading and managing teams is less easy than expected**