



INTERNATIONAL OPERATIONS & MAINTENANCE CONFERENCE  
IN THE ARAB COUNTRIES

UNDER THE THEME

**"MANAGING MAINTENANCE WITHIN INDUSTRY 4.0"**  
CONICIDE WITH THE 16<sup>TH</sup> ARAB MAINTENANCE EXHIBITION

## **The European Experience Regarding Industry 4.0**

*The Impact of Emerging Technologies & the Resultant  
Challenges Facing the Maintenance Function*

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# 4.0



**sapartners**  
Together, the power to improve

# Japan 1992-Light Bulb Moment ! CHIM.....

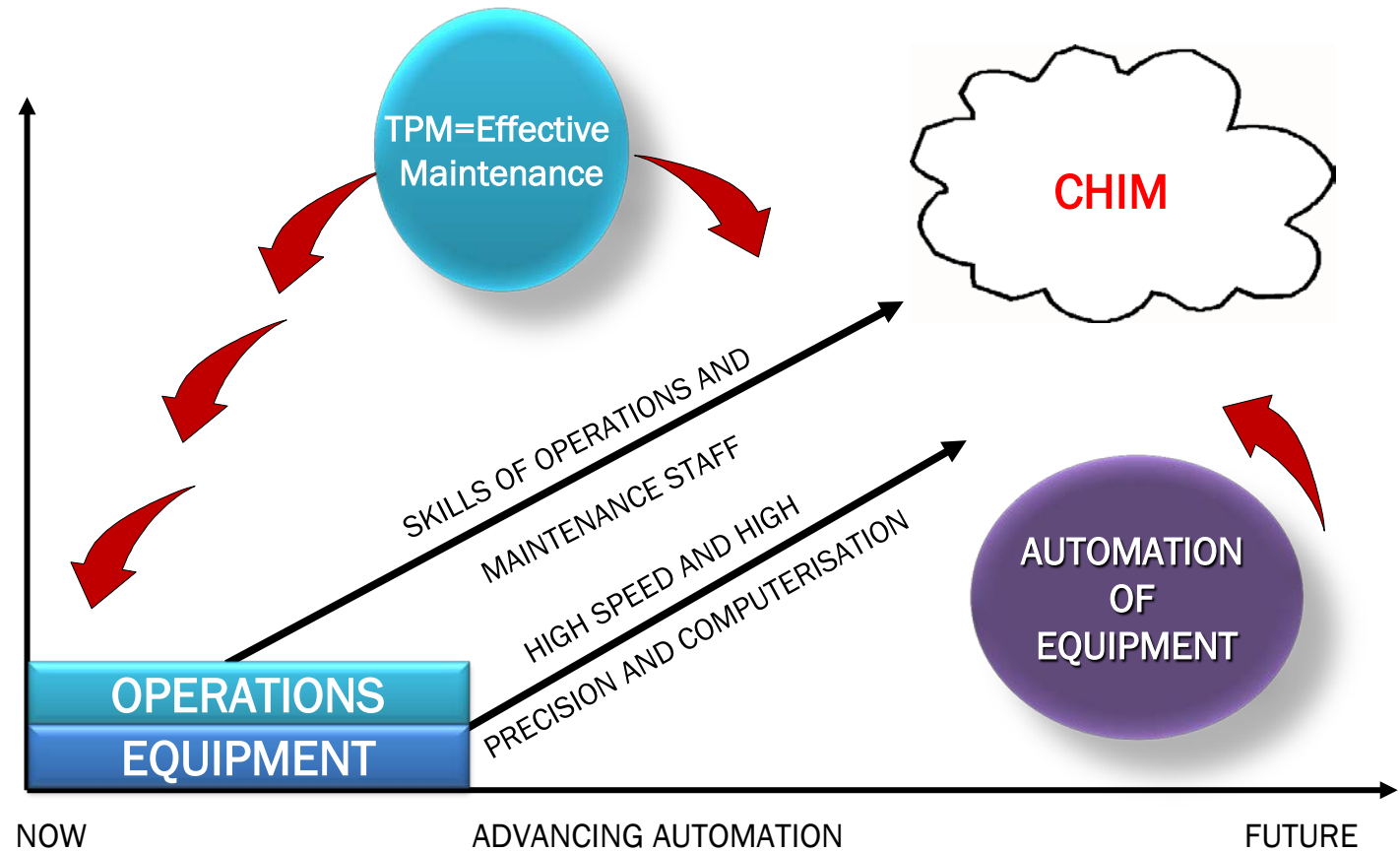


<b>Key Performance Indicator</b>	<b>Start Point Reference</b>	<b>6 Years Later</b>
Breakdowns per month	250	5
Overall Equipment Effectiveness	65%	88%
Productivity Index	100	180
Return on Investment	\$1.00	\$4.50

# The Future Vision & Impact of Industry 4.0 on Maintenance



DEVELOPMENT  
OF TECHNOLOGY  
AND SKILLS



Computer/Human Integrated Manufacture

Is No **Dream** But Reality !

# The Problem and hence Opportunity facing Businesses

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## **Survey of over 400 European based businesses**

- 68% are concerned the education system will not deliver skills required for technological change implied in Industry 4.0.
- Only 51% say they are taking steps to influence the content of degrees and the technical training engineers undertake

## **McKinsey survey findings**

- 7 out of 10 companies have yet to define their STEM skills gaps
- Only 1 in 10 are implementing a plan aimed at bridging the skills gap impact.

# 5 Key Questions to Ask.....

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- Q1-Is your Company keeping pace with the emerging Technologies of Industry 4.0?
- Q2-What percentage of time spent by your current staff is fully productive and hence 'value adding'?
- Q3-How good or effective are your Systems of Work and supporting processes to systematically improve on your answer to Q2?
- Q4-How well does your organisation encourage a positive attitude to learning in the workplace?
- Q5 -How well defined is the ideal engineering team skill profile, where are the gaps and how good is your company at developing the skills it needs?

# Question 1

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Is your Company keeping pace with the emerging Technologies of Industry 4.0?

- The rapid pace of technological progress means traditional academic education cannot keep up with developments in eg memory capacity, sensors and artificial intelligence.
- In-house practical hands-on '*Learning by Doing*' projects is essential. Organizations that do this well focus on pockets of automation using multi-disciplined teams

# Question 1 Continued

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Is your Company keeping pace with the emerging Technologies of Industry 4.0?

- The European experience shows that front-line operators with training and combined with routine cleaning and inspection checks pays big dividends acting as the early warning system for their maintenance colleagues to take preventive action and avoid catastrophic breakdowns.
- This approach is at the heart of the well proven TPM philosophy.

## Question 2

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What percentage of time spent by your current staff is fully productive and hence 'value adding'?

- Let's take an example of the typical Maintainer's use of time in response to a Breakdown
- With the interactive nature of real time data collection within Industry 4.0 digitalization, this allows our CMMS systems to report each of the 11 sequential steps below.



# How much of a Maintainer's time is actually 'value adding'?



- An Equipment Breakdown occurs. (The clock starts ticking....)
- Break down is Reported to Maintenance Planning
- Planning allocates a 'Maintainer' & informs that resource
- Maintainer goes to see equipment broken down at its source
- Isolate ,initial Inspection, appraisal, discussion, decision
- Leaves source equipment to get necessary tools, parts, kit
- **Return & carry out Repair (*this Value Adding part is typically only 15% of total elapsed time*)**
- Test / check/ start up & adjust
- Confirm to the user as satisfactory
- Formally hand back to 'asset owner'
- Sign off job as complete to Maintenance planning

Classic Mean Time to Repair (MTR) needs to become MTT Respond & Repair (11 steps only one is adding value)

## Question 3

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- How good or effective are your Systems of Work and supporting processes to systematically improve on your answer to Q2?

# What Can We ECRS?

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Produce a Current State Map of the 11 Steps  
And set a Challenge for the Future State, by asking  
what steps can we:-

- *Eliminate ?*
- *Combine ?*
- *Replace ?*
- *Simplify ?*

*And then Implement and then Standardise that FS*

# Current State Maintenance Response time of 145 mins

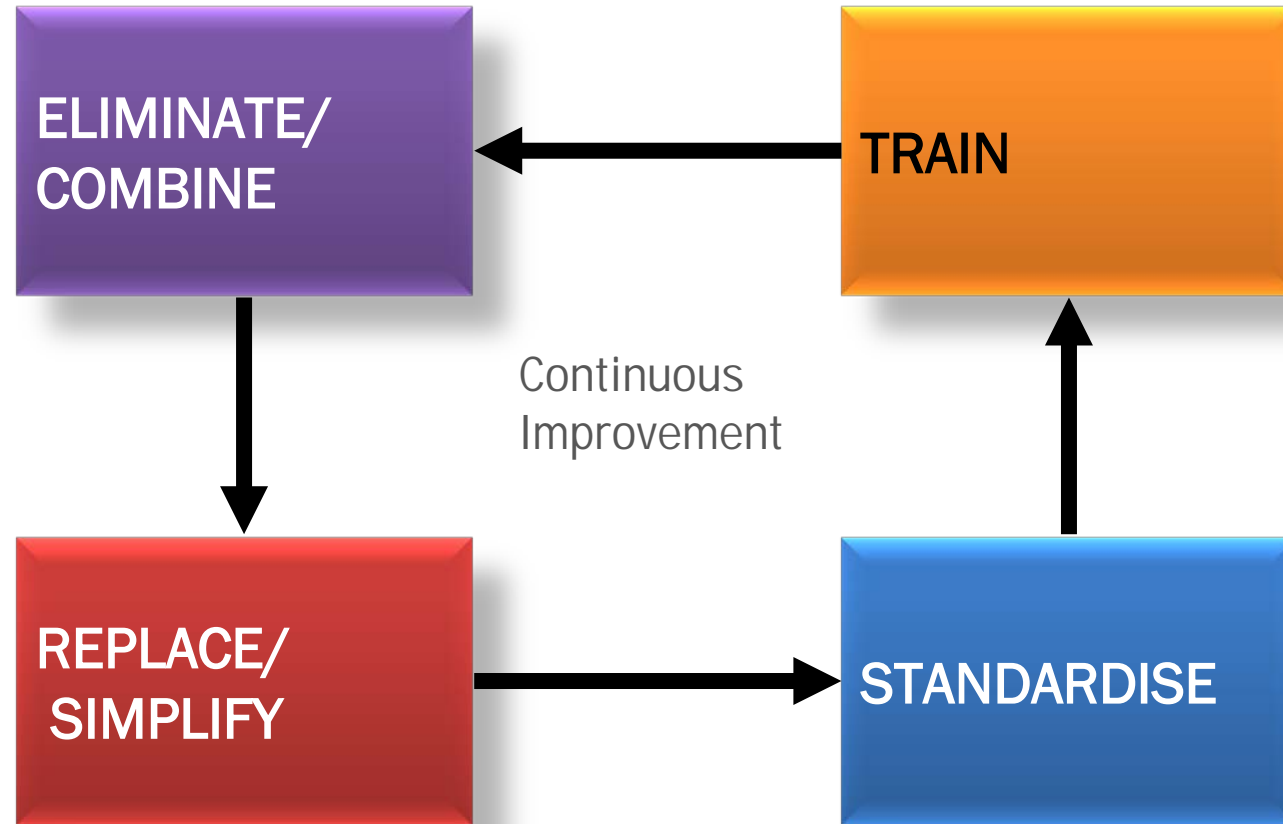


# Future State Maintenance Response time of 72 mins

(50% Reduction via 34 opportunities)



# Continuously Review and Improve Through.....



# Question 4

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## **How well does your organisation encourage a positive attitude to learning in the workplace?**

- Skilled personnel are not usually tempted to change jobs for just personal development opportunities and / or financial reasons alone. They tend to be motivated by in-house opportunities for self-development and job satisfaction. European Surveys show that training and development are key job satisfaction factors for nearly 70% of STEM workers. Food for thought if you want to keep the engineers you have!

# Question 5

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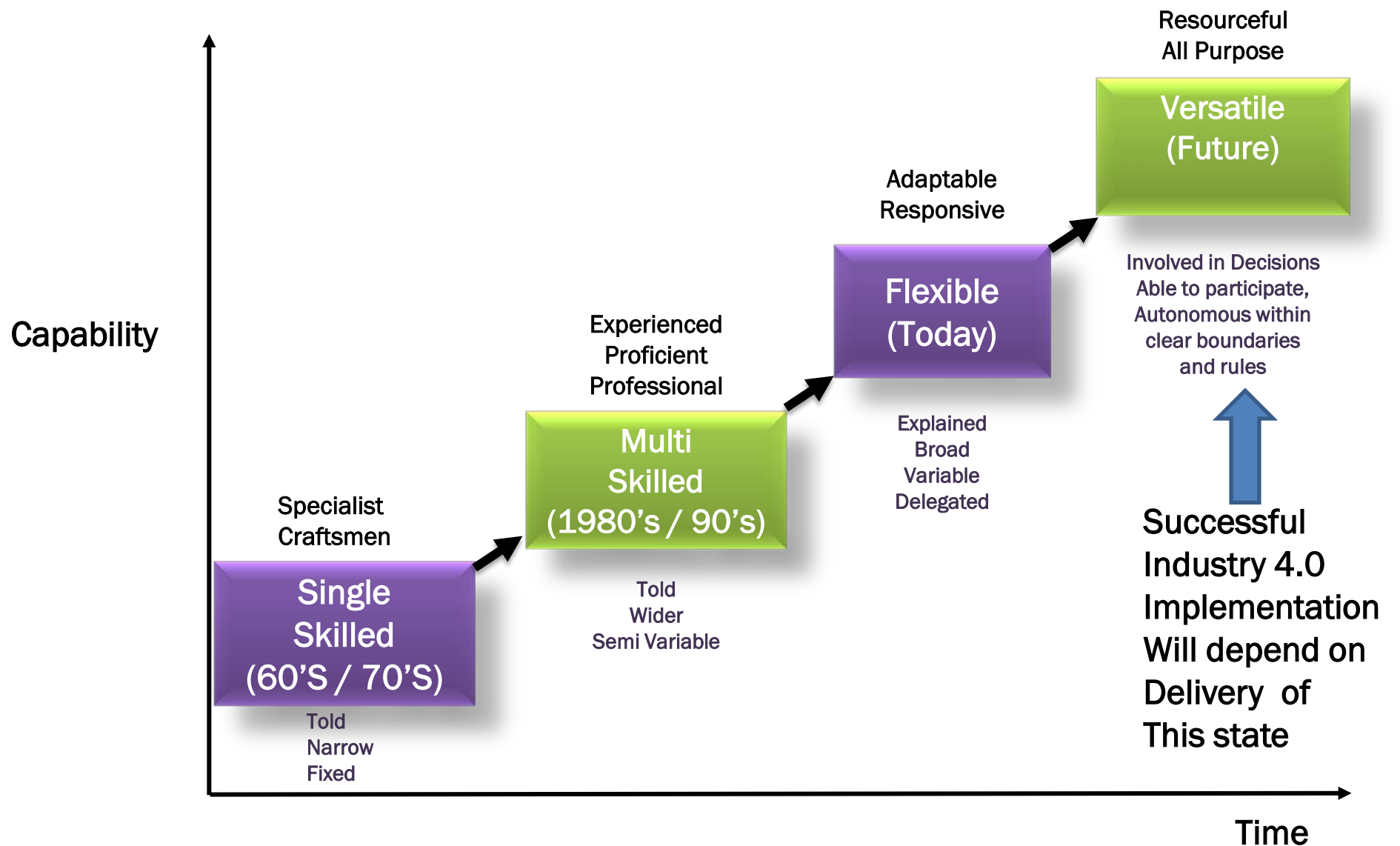
**How well defined is the ideal engineering team skill profile, where are the gaps and how good is your company at developing the skills it needs?**

- This includes transferring lessons learned and helping engineers to acquire new capabilities. Organisations that do this well can reduce the time to achieve local site specific competency levels by as much as 75%.
- The European experience of Skills Capability Development over the last 40 years have been driven by enlightened attitudes from both Trade Unions and Management **working in partnership**



# The Learning Organisation & Industry 4.0

## The European history and experience



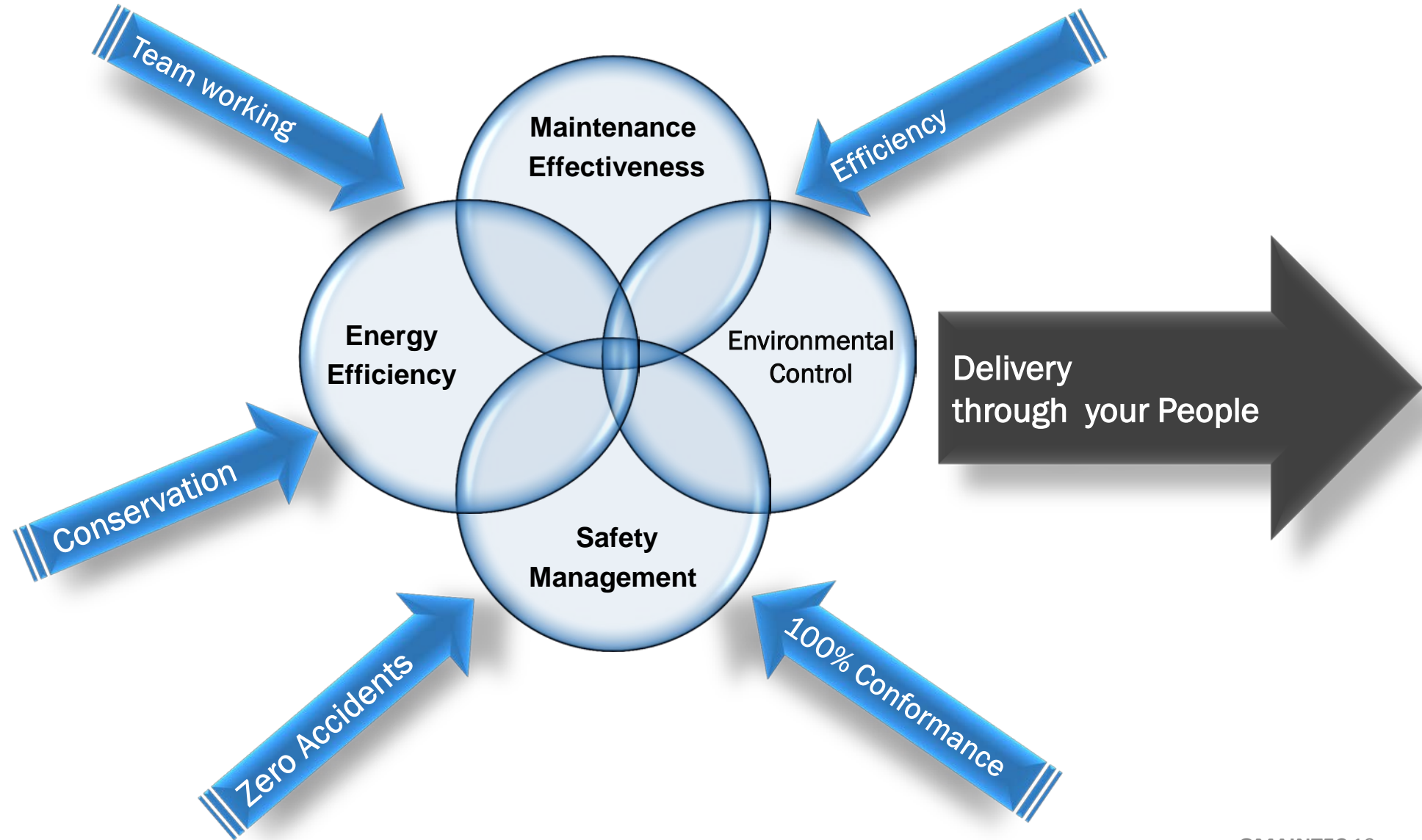
# A Key Message to Remember.....

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**“..... The Quality of Our Maintenance will assure the Maintenance of the Quality of your Product and Processes”**

# Making Your Plant a 'World Class' Facility, Where the Future Drivers for Industry 4.0 are:



# Finally-a health warning.....

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**Do not let the Technological Tail of Industry 4.0 Wag the Dog!**

