TPM AND CORPORATE CULTURE FROM THE PERSPECTIVE OF EXCELLENT COMPANIES MANAGERS

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Abstract

Managers of excellent companies in the Czech Republic mens in Kaizen Congress regularly each year, where they use a panel discussion, gemba walks in a benchmark company, fill in the questionnaire, give lectures, workshops and present concrete proposals as a results of their managerial work in continuous improvement. The aim of this paper is to present practical and specific starting points, relationships and recommendations of successful corporate management in the Czech Republic. In the research methods, questionnaire surveys, group interviews and attendance observations were used. These congress was focused on two key areas: 1. Total Productive Maintenance (TPM) and 2. Corporate culture and change management. The authors have analysed and evaluated all outputs and have done the opinion research of 60 managers from 27 companies world-class in both of the areas. The conclusions are summarized in practical case studies and recommendations in the above topics of the Kaizen Congress

Keywords

Total Productive Maintenance, Autonomous Maintenance, Gemba Walks, Corporate Culture, Change Management, Kaizen

I. Introduction

International company KAIZEN Institute held 8th Congress in the cooperation with Assa Abloy Czech & Slovakia Company in Rychnov nad Kneznou at the end of 2013. This congress was called: *"About machines and people… and about the fact that people are not machines,"* main aim of this congress was to create opportunities for changing experience from business practice, to get inspired by new trends and to acquire new contacts. 60 managers, lean specialists and specialists from 27 companies and organizations from Czech and Slovak Republic participated in the congress. The participants were from companies: Rohde & Schwarz Vimperk, Fraenkische Okříšky, OEZ Letohrad, FVE BS Letohrad, KH-Cetto Chodov near Karlovy Vary, Embraco Slovakia, Magneti Marelli Slovakia, Kuststoff-Fröhlich Czech Plast Písek, Česká spořitelna, Kaizen Institute Polsko, Rohde & Schwarz Vimperk, Kostal CR Zdice, VŠB - TU Ostrava, MASM Žilina, Valeo Compessors Europe Humpolec, Třinecké železárny, Aisan Industry Louny, BOS Automotive Products Klášterec, Assa Abloy Rychnov, Mann-Hummel, Tokoz Žďár nad Sázavou, RM Gastro Veselí nad Lužnicí, VUES Brno, SAS Autosystemtechnik Mladá Boleslav, Kaizen Institute Praha.

The congress concentrated on two topics:

1/ Total Productive Maintenance (TPM)

Specialist's information about trends and experience; everything about machine's and equipment maintenance leading to maximum effective production, autonomous maintenance, predicative maintenance, steps to implement TPM system, sharing experience from practice, methodology, employees training systems, and discussion.

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2/ Company's culture and its change

Motivating employees to get involved in improving company's processes and their personal approaches, functional remuneration systems, team work, employees development, mutual support and respect in company's culture. The devices and tools for company's culture change were also discussed.

The specialists and managers presented interesting results which were achieved by their companies in the TPM area and in managing company's culture. Therefore, the authors have decided to elaborate and publish these outputs. The authors point out not only the changes and what trends are these successful companies using, but they also point out practical experience and achieved results which have inspiration character for those that would like to follow them.

II. Course of Kaizen Congress

The authors have noted and elaborated outputs from several applied methods and work techniques by managers during the congress. Among the most important belong:

1. Presentation of achieved results of companies in the TPM area and change of company's culture – holistic benchmark.
2. Gemba walk:
   2.1 Looking for losses and waste with gemba walk
   2.2 Recommendations for improvement
3. Comparing of reached TPM level and Autonomous maintenance among companies
4. Workshops aimed at creating common vision of company's culture leader of the future
5. Controlled panel discussion – topic: Gemba Kanri for supervisors and middle management

2.1   Interesting presentations of achieved results in the area of TPM and company's culture

Company *VALEO Compressors* have created ERIM system (**E**quipment **R**eliability **I**mprovement **M**anagement). Main aim of the system is to eliminate the following problems in the area of TPM and autonomous maintenance:

1. The level of quick response is insufficient.
2. Preventive maintenance is not sufficiently defined, fulfilled or managed.
3. Problems without determining their cause are repeating.
4. The maintenance workers are "Problem's firemen".
5. Operators do not take over responsibility and they do not feel ownership of the machine.
6. The managers do not pay attention to maintenance enough.

Třinecké železárny Třinec company have concentrated on planned maintenance system TPM change and autonomous maintenance.

Table 1 The Planned Maintenance System

Before:	After:
1. Card (paper) system of marking and writing machines' and equipment's abnormalities	1. Electronic on-line record about abnormalities enables us to immediately see abnormality and enables the maintenance to react and accept measures more quickly (MTBF and MTTF time reduction)
2. Distributing lubricants and oils without controlling its consumption and measures to decrease consumption	2. Lubricants and oils consumption is regularly tracked and evaluated and measures for their decrease are accepted.
3. OEE indicator of machines was evaluated always at the end of the shift according to real production and plan	3. On-line tracking of OEE indicators on main machines and lines for individual shifts A,B,C enables to quickly react on changes in production versus plan.

Source: Own processing

In **KH Cetto** company, the managers in cooperation with their employees have created pilot project so called SQM team (Safety, Quality, Motivation) in order to try if such team will be successful in improving the process of quality and machine's and equipment's maintenance. SQM team consisted of 12 members (management, maintenance, operators, quality, technology etc.). Work of SQM team:

- The team has regular workshops (30-60 min.) in production or in the conference room.

- Topics: consulting and evaluating found losses or waste, sharing information among team members towards TPM and Autonomous maintenance etc.

In 2013 SQM team submitted 26 improvement proposals and in total they saved € 32.685. The reward for the team was € 1.600. The pilot project was successful and the company is building another SQM teams.

Plant Manager from **Magneti Marelli Slovakia,** Pierre-Emmanuel Pazdej presented how you can support successful empowerment in this plant by leadership. Leaders are learning how to actively utilize:

1. Guide and propose a vision,
2. Share accurate information,
3. Create autonomy through explanation,
4. Development of team spirit.

Frankische Industrial Pip*e* company has implemented a program called Kaizen Chameleon. The employees have selected this lizard because its characteristics and behavior is typical also for the behavior of people in company (i.e. He is an excellent strategist – hunter, he can look to every direction and to a far distance up to 1 000 m, he can adapt to any conditions, he can strongly hold to any branch, has a perfect overview about what is happening around him). Employees' goal is to have a symbol which will support their cooperation, motivation and company's culture values.

In **OEZ (SIEMENS)** company, the employees realize the intercultural differences in Czech-German managerial environment. They look for a way towards Reconciliation of Corporate culture. The main differences are in the following table.

Table 2 The differences between German and Czech approach in culture

| German approach	Czech approach
Goal oriented	Relationships oriented
Avoiding risks	Improvisation
Explicit expressions	Implicit expressions
Monochromic perception of time	Polychromic perception of time
Separating spheres of life	Blending spheres of life

Source: Own processing

German and Czech companies share best practice in the area of TPM, OEE, productivity, building lean organization. These activities help in the convergence of both cultures.

2.2 Loss and waste analysis, improvement proposal from gemba walk

All of the congress participants (60) have participated in finding losses and waste in the production of a hosting company within gemba walk. 86 losses and waste were diagnosed; they were categorized into 10 groups. Following graph shows overview of found losses and waste according to frequency.

**Graph 1. The structure of losses and waste**
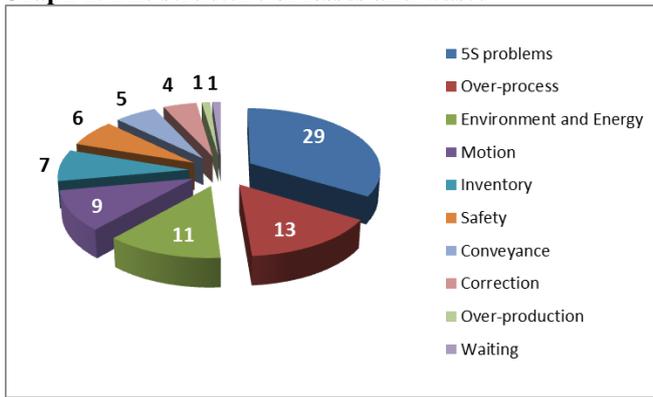
Source: Own processing

8 basic types of losses *(modified according to Masaaki Imai, 1986):*

Second activity of gemba walk participants led to the elaboration of proposals to improve found problems. 85 proposals were created in total. First three places took proposals pertaining to Productivity, Logistics and Inventory and 5S. Assa Abloy company will assess and incorporate these proposals into their Kaizen program for year 2014.
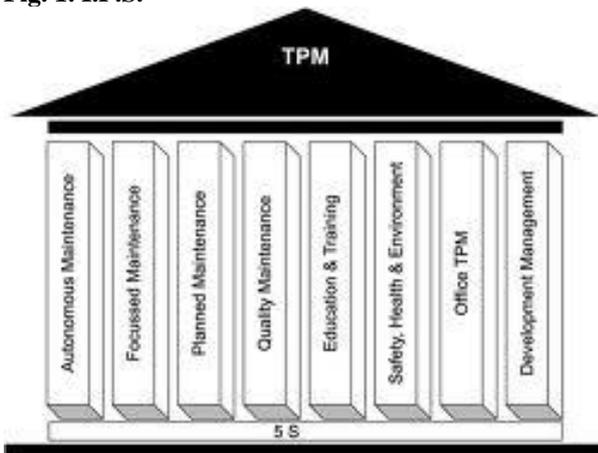
Graph 2. The structure of losses and waste
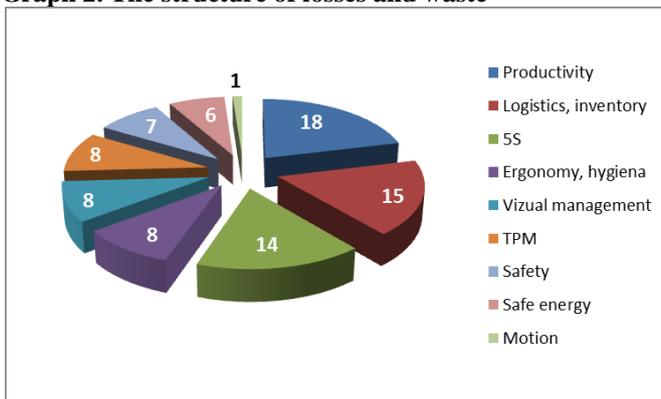
Source: Own processing

2.3 TPM results

Next workshop was aimed at presentation and comparison of implementing TPM in companies. The authors have utilized well known 8 pillars TPM model (Fig. 1) and they have written the results into a table.

Fig. 1. I.P.S.

Note: Approach suggested by the Japan Institute of Plant Maintenance

Source: Ahuja, Pankaj Kumar, (2009)

Table 3 TPM results from workshop

TPM factors	TPM results
5S	This method was the most tracked within gemba walk. Therefore, most insufficiencies were found in the connection with application and obedience (maintenance) of this technique. 1S to 3S are well managed by companies. 4S (there is a problem with discipline and obedience) and 5S (motivation for improvement is missing) are still in the developing phase.
Autonomous Maintenance	Places responsibility for routine maintenance, such as cleaning, lubricating, and inspection, are in the hands of operators. From the company's information exchange we found that they are currently between 3 and 4 level.
	3. level Interim standards for Autonomous Maintenance. Development of behavioral standards which quickly assure continuous cleaning, greasing and adjusting of machine parts.
	4. level General Inspection. Instruction and training in inspection-capabilities. Identification and elimination of minor abnormalities.
Planned Maintenance	Companies have achieved 4. Level - build up a periodical Maintenance system. Some companies improve higher level and build up a preventive Maintenance system. Schedules maintenance tasks based on predicted and/or measured failure rates
Quality Maintenance	Some companies have created Obeya room or QRQC room. The teams of specialists involved with the planning gather in a 'Obeya Room' to achieve faster communication and shorter decision-making processes. Obeya contains visual charts and graphs depicting program timing, milestones and progress to date and countermeasures to existing timing or technical problems.
Focused Improvement	Companies have small groups of employees work together proactively to achieve regular, incremental improvements in equipment operation.
Early Equipment Management	Directs practical knowledge and understanding of manufacturing problems.
Training and Education	Companies fill in knowledge gaps necessary to achieve TPM goals. Applies to operators, maintenance personnel and managers.
Safety, Health, Environment	Companies eliminate potential health and safety risks, resulting in a safer workplace. Specifically targets the goal of an accident-free workplace.
TPM in Administration	Apply TPM techniques to administrative functions.

Source: Own processing

2.4   Workshops aimed at creating common vision of company's culture leader of the future

This issue is a very relevant and important area of analyzed domestic companies' interest. Currently, this strategic area is primarily considering work with staff motivation for involvement in improving business processes and personal approaches, functional reward systems, teamwork, employees

development, mutual support and respect of employees to build corporate culture, flow mapping company values, attributes corporate leader, artifacts of corporate culture.

Each employee is responsible for his finished work, work process and their work environment. Employees and teams actively accepting responsibility vested in order to achieve goals. Here, based on the philosophy that a responsible and motivated employee brings to the value and helps it to improve further. Values represent the highest level of corporate culture. It is a general awareness of what is good and what is bad, what is normal and what is not. The values are reflected in the work ethic of community workers with the company and the overall orientation of the company. They should be shared by all employees, or at least the employees who are in a leadership position.

Results of the analysis of corporate culture workshops

Within the methodological analysis was necessary to create semantic categories that the issue of corporate culture and its relation to other most transparently presented. This is a fundamental, guiding themes, which consist of basic questions and subsequent authentic team outputs that are described and characterized by individual workshop participants.

Table 4 Workshop 1

Workshop 1: Changes in Corporate Culture "*Successful society changes before they must*" - J. Ridderstrale	Outcomes of the Workshop (required measures)
Basic questions: 1. How to show the need for change	- Communication with staff - Explain the benefits, prosperity and competitiveness for the company - The role of owner and top management as the bearer of change - Change must be managed, must follow the trend of solution - Find a mistake, find the problem, falsification process
2. How to change the unwanted into wanted	- Set up an effective incentive system changes - Support the process of adaptation of employees to change - Get rid of the biggest opponents of change - Engage in a process of change skeptics
3. Positive culture change	- A long-term process, - The essential role of culture bearers - The vast openness, clarity, honesty and transparency in all processes within the organization
4. Barriers in the process of change	- Unclear priorities - Lack of plan changes - Unclear objective changes - Fear of change, - Lack of management support, - Lack of resources for change - human, financial
5. Vision and mission - its role in the change process	- No specific vision cannot make any changes in corporate culture, - Guidance for change
6. Corporate Social Responsibility	- Social responsibility is a benefit to the community, - Is a mirror of cultural change - Let us work in a way that our children could and want to work after us
7. Power Teams	- Believe in what they are doing, - Authority, competence, - The desire to work - Talented individuals - Creation of strategic partnerships

Source: Own processing

Table 5 Workshop 2

Workshop 2: Corporate Culture and Motivation "*To win the game outside, we must first win the internal*" - T. Gallwey	Outcomes of the Workshop (required measures)
Basic questions: 1. Leaders attributes	- Expertise, visionary foresight (Astute) man, charisma, leadership pattern, communicative, be different, motivator, implementer, stamina, ability to ignite of teamwork, integrity, consistency, humility, self-reflection, - the most important person in the company
2. Leaders' ability to decide on the survival of companies	- create a suitable working environment
3. How can we mobilize own potential and the potential of our employers	- Confidence in their ability - Search and find the right people, - Exploit the strengths, - Delimitation of powers - Reward, moral and financial recognition of the work
4. Disincentives factors	- Wrong, missing leader, - Unclear goals, - Poor communication, - No or minimal feedback - Inconsistency - Injustice, - Unclear rules of the game - Uncertainty - Unfulfilled promises
5. Coaching, mentoring internal and external	- Not to be afraid to confide, consult, - Not being afraid to take into the team better educated, more capable peers, - Cooperation with experts from technical universities qualified employee are usually more efficient
6. Empower and empowerment	- We are afraid to delegate powers down - Increasing confidence in our own abilities - Corporate school, academy, - Post for knowledge workers
7. Examples of self-energizing and Self Improvement	- Self-reflection, - As they do elsewhere, - Education, - Work with students

Source: Own processing

Generally it can be summarized that the main functions of corporate culture include:

- Reduction of conflicts within the organization, sufficiently strong organizational culture promotes coherence, consistency of problems perception.

- Ensuring continuity, facilitate coordination and control, the same perception of the values and norms of behavior determines the desired behavior and discipline.

- Reduction of uncertainty, the effect on the morale and emotional well-being - consistency between internal standards of work and organizational culture.

- Motivation, sense of purpose work gives the worker feeling that he is an important part of the organization.

- Competitive advantage - if the organizational culture is strong.

2.5 Controlled panel discussion – topic: Gemba Kanri for supervisors and middle management

Table 6 Panel Discussion

Panel Discussion: Middle Management Leadership "*Managers! Do not do anything worker can do it myself* "- R. K. Sprenger	Outcomes of the Workshop (required measures)
Basic questions: 1. Modern methods of improving	- Obey Room - operative meeting (max. 15 min) - Escalation and discussion - Decision making and prioritization
2. Effective team	- A sense of belonging - Composed of various departments - Opinion loyalty - Time required for maturation - Creating relationships - Synergistic effect
3. Internal Communication	- A true basis for process efficiency - Across the company - Determination of forms - Personal contact - Desire for openness - The art of listening
4. Recipe for success	- Persistence, - Be yourself - Know your advice at all times, - Learn from failures, - Healthy communication - Continuing education and staff development - Rewarding employees for new ideas studies of successful companies
5. The middle management is dealing with	- Are overwhelmed by operations and administration, - Looking for material - Enforce morality, - Operational responsibility for solving problems - Block the development team, - Unaware de-motivator, - Covering for operators - Take care of message boards - Train new people - Resolves personnel matters, - Resolves disputes on the line, - Are responsible for the production plan, - Looking for excuses to give up, - Struggling with logistics, quality
6. The middle management should deal with	- Taking care of people, - Leading, be an example, - Not spending time by doing administration, - Control the people more, - Develop team - To systematically improve processes, - Look for potential - Motivate, - Work independently, - Learn
7. Freedom of staff	- Employees often fight with themselves and only for themselves, - Accountability + confidence = Freedom - Each organization must have its limits

Source: Own processing

III. Case Study – Main progress of TPM ASSA Abloy C&S

Year 2011

January: Start TPM program. Splitting of machines according to importance to the group AA, A, B, C (511 machines, average age 22 years) instructions for AU creates by maintenance in cooperation with the production supervisors, most often by the machine manufacturer. Instruction of AU are for lubrication and inspection rather than cleaning. September: We are launching equipment for automatic tracking OEE, installed to the 30 most important machines. But people learn to write correctly to the OEE system more than half a year. Then we have correct data.

Result 2011: Maintenance costs do not fall. Do we make it right?

Year 2012

February: Launching a monitoring system of maintenance, repair history, important parameters MTTR and MTBF.

March: setting up a partnership with the Kaizen Institute, KI performed audit of the TPM and we receive 20 %. The most important finding of the audit is: We're not going according to TPM methodology. We skipped the first two steps, and we just jumped directly to the 3^{rd,} Audit show us that people understand well the importance of 5S but TPM not.

June: A pilot project workshop TPM with an external consultant of Kaizen Institute, according to the methodology: theory, to explain to people, remove covers of machine and everything cleaned, mark founded defects, repair it immediately, or write into to-do list. Create instruction cards for regular cleaning machines, daily, weekly, etc., Created by operators and setters who participated in the workshop. August: Roll out to other machines, three workshops per month. Implemented 5S maintenance and spare parts warehouse, a system for improving search for spare parts in the warehouse and improve the recording of consumption of spare parts.

Result of 2012: 14 workshops of autonomous maintenance was performed, 80 instruction of preventive maintenance was created. Record maintenance costs, problems with deliveries due to machine failures persist. OEE is a little better, MTBF rises slightly.

Year 2013

Clear objective for 2013 - reduce maintenance costs at least 25%. Another audit showed that preventive maintenance tasks are performed only by 20%. In addition, maintenance is snowed under with tags of autonomous maintenance from workshops. Maintenance guys do not understand what is maintenance reporting and root causes of defects are not detected. The reason: maintenance hasn´t time only solves urgent problems. We made a decision to allocate two maintenance guys only for preventive maintenance. Start with step 4 and 5 of autonomous maintenance, it means converting simpler maintenance work directly to the setters. New TPM visual boards directly on machines. After 3 months we founded that people still do not understand to all indicators. Autonomous maintenance done well. Roll out to the other machines according to plan.

Results for 2013: We implemented next 38 workshops of AU TPM was performed. Preventive maintenance was carried out from 63% last month over 80% from all planed actions. Reducing maintenance costs by 25%) increase OEE by 17%, generally less equipment failure, in January 2014 managed all orders with minimal maintenance costs, OFR rises over 98%. It seems, TPM is beginning to pay.

Graph 3 TPM is a project for years, the first year you're trying, but you do not see results, TPM means patience
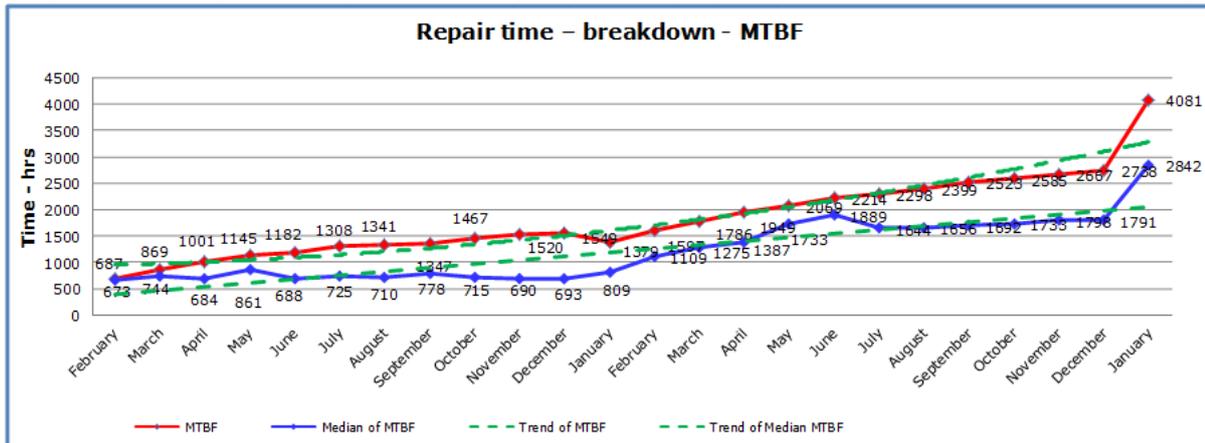
Source: Own processing

IV. Conclusion

Kaizen (fr. Jap. "*improvement*" or "*change for the better*") refers to philosophy or procedures for improving processes in production, especially in engineering and business management. The essence of KAIZEN simply means continuous improvement. Japanese managers generally claim that there is no profit, but quality, because if you take care of quality, the profit will come out of the way. If we want to start with improvement, perhaps the easiest way is to find, identify and eliminate the waste of available resources and time. Corporate culture is presented as "sharing philosophy, ideology, values, beliefs, assumptions, expectations, attitudes and norms. It shows both the overall atmosphere in the workplace, how individual people behave, what their habits, habits, dressing and other unwritten customs have in the company. It also shows what access to customers and other business partners is. TPM (*Total Productive Maintenance*) is a set of activities leading to the operation of the machinery in optimal conditions and the maintenance of these conditions. The TPM is based on proactive and preventive maintenance of equipment and machines and emphasis on their high reliability and rapid return. Like TQM, TPM is a lot about employee access and is therefore an integral part of corporate culture. It is based on eight main pillars: autonomous maintenance, planned maintenance, quality maintenance, narrow-focus improvement, rapid deployment of new equipment, employee training, safety and health at work, TPM in administration. As part of economic policy, it should be noted that a regular meeting of leading, successful companies and organizations within the Kaizen congress presents specific advice and recommendations for other domestic companies in their activities and development. These activities are among the most effective tools to increase the competitiveness of companies and businesses operating in the Czech Republic. In addition to the traditionally strong industry, the performance of most sectors of the national economy, including the service sector, is increasing. It is obvious that people and companies have confidence in the positive development of the Czech economy and are not afraid to spend and invest.

Acknowledgements

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