Abstract: Performance organizations requires sustainable design analysis and process optimization manufacturing and mining products and services to reduce quality costs in industrial companies. Article based on presentation of the link between sustainability and quality costs, presents the main methods and techniques to counter industrial companies and focuses on sustainable techniques for reducing quality costs in industrial societies. Modern techniques but effective design (robust design), manufacturing (Lean Six Sigma System, Lean Process Principles, Just-In-Time Production, Total Quality Management) and post-sales activities enable the development of processes based on responsible use of resources by eliminating waste and transfer internal and external users of reliable cost related to quality and professionalism.

Key words: techniques, sustainability, cost reduction, quality, industrial companies

1. INTRODUCTION

Referring to all practices to achieve balance between the socio-economic and natural environment, sustainable development concept „catering for the needs of the present without compromising the ability of future generations to meet their own needs‟and decisions about how the decision in any such action man or environment. This is the most common definition of development given by the World Commission on Environment and Development (WCED) report in "Our Common Future".

Opening of the sustainability showed how companies can make savings. Today, sustainability is 99% in cost reductions and 1% in reducing the environmental impact that has PR value. Companies that implement quality programs can reduce the cost of quality by 25% in half in 18 months, and a further reduction by half in the other 18 months. With a right, so you can reach world class status in three years.

2. COST IMPACT ON QUALITY

A method for quantifying the quality refers to the measurement of quality costs, or non-quality costs, a measure indicating how much does it cost annually to provide quality management activities and industrial company, the products and services and related activities.

2.1 Actions that require reducing quality costs

As cost reduction, using of prevention (training quality, design process, removing the cause of failure, change process, quality audit, maintenance and environmental audit) as well as concepts assessment (tests, measurements, evaluations, problem analysis, inspection, verification), which started trading in the underlying industrial companies.

2.2 Elements of direct or indirect impact on quality

Almost all the costs of quality generators have direct or indirect impact on the environment and society. Identify in this regard internal defects (scrap, repair, unscheduled service activities, removing defects, lost production time, use more resources, waste processing technologies, scrap and other waste) but external faults
(returned products, customer complaints due to reductions in billing, recall products within warranty expenses, legal costs, reduced availability of product operation, malfunction, replacement and reduced safety)

2.3 Quality Measures imposed to reduce costs
The life cycle of a product from design to implementation, use and recycling, industrial companies must be responsible to correct, mitigate or eliminate the losses caused. Other ways in which quality-related costs can be reduced: using calculations at the preliminary studies or by a decision taken by the leaders of the industrial company.

3. MODERN DESIGN TECHNIQUES FOR INDUSTRIAL COMPANIES
Actions aimed at countering the negative and positive development involves:
- Design changes
- Stimulating action to find solutions to reduce the negative implications; promote project-delay
- Promoting the development of monitoring programs of environmental harm
- Defining the rules to introduce new types of projects, with little effect on the environment
- Defining the appropriate institutional environment
- Initiating actions to inform and educate the public
At the stage of design or redesign products resource consumption issues and environmental impact must be considered. Techniques useful in the design are: robust design, target costing and value engineering. Robust design takes into account the three dimensions of quality cost, expressed in total cost quality triangle: Unit Manufacturing Cost, Life-Cycle Cost, Quality Loss Cost.
In terms of sustainability, the three types of costs should take into account the impact on resource use and waste management. Life-Cycle Cost refers to the specific costs of the product operation (supplies power, warranty, repairs), and take into account the environmental impact of product and related services. Quality Loss Cost identify the economic consequences of deviation from the target and customer losses, manufacturer and society. Design method “Target costing” is an essential element of manufacturing employment costs in a cost target and focus more on reducing use of material resources, energy.

4. METHODS AND MANUFACTURING TECHNIQUES AND FIGHTING FOR INDUSTRIAL COMPANIES
Modern manufacturing systems known as Lean Six Sigma offer a range of techniques and methods to counter industrial companies, aimed at responsible use of resources: Lean Six Sigma System, Lean Process Principles, Just-In-Time Production, Total Quality Management.
In the table below are the individual characteristics of the methods specified are:

<table>
<thead>
<tr>
<th>No</th>
<th>Modern Manufacturing</th>
<th>Features</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>Lean Six Sigma System</td>
<td>clear direction of quality costs, sustains competitive advantage</td>
</tr>
<tr>
<td>2.</td>
<td>Lean Process Principles</td>
<td>flow value and perfection of the process</td>
</tr>
<tr>
<td>3.</td>
<td>Just-In-Time Production</td>
<td>production based on the forecast and actual demand</td>
</tr>
<tr>
<td>4.</td>
<td>Total Quality Management</td>
<td>manufacturing process control, delivery, customer service, quality management</td>
</tr>
</tbody>
</table>

Table 1. Important characteristics of modern manufacturing systems
5. THE LEAN SIX SIGMA SYSTEMS

Lean Six Sigma is: improving quality and efficiency of processes based on a strong project and quantitative approach with clear target setting. For long-term success and sustainability of excellence in operations, techniques must be supported by an organizational philosophy that complete context of transactions.

The principles of Lean Six Sigma:
- Thinking long-term emphasis on providing value to industrial society
- Make the correct process leads to desired results
- Developing staff and partners
- Solving the fundamental problems of the system as a key learning-improvement

Lean Six Sigma Implementation
- Is a flexible system for achieving and sustaining business success
- Is focused on deep knowledge of customer requirements, to improve product quality and minimizing costs
- Is a unique business process, the analysis allows industrial companies to drastically improve profitability by designing and monitoring business activities, daily, in ways that minimize losses

In recent years, Six Sigma was sometimes combined with histograms which led to a methodology called Six Sigma slope.

Fig. 1 Six Sigma Slope

Advantages of the method Lean Six Sigma: When these pieces are in place, Lean Six Sigma’s relentless pursuit of product quality and process speed leads to corporate success and to personal success for the people who contribute to that journey.

DMAIC – pattern to improvement (and use of data and process tools) can naturally divided into the five phases of problem solving, DMAIC: Define, Measure, Analyze, Improve, Control.

6. LEAN PROCESS PRINCIPLES

Lean production is a production philosophy that reduces the time between customer order and manufacturing, delivering the required product by eliminating waste. Lean production uses less of everything compared with mass production or mass, half the manufacturing space, half the investment of equipment, design half hours a new product.

Principles of Lean process
- Perfect quality first
- Minimize losses by eliminating activities that do not add value
- Continuous improvement - flexibility
- Long-term relationships with customers and suppliers
- Focuses on the evolution and change and not is only an idealized technological level

Lean implementation process
- Refers to a new dynamic process of evolution of production, which covers all aspects of industrial operations (product development, manufacturing, organization and human resources, customer service)
- Is focused strictly on customer-supplier networks, systemic process driven by a set of principles, methods and practices

Benefits of Lean process
- Requires much less storage of stocks, resulting in fewer defects and a growing variety of products
- Production is a phenomenon that seeks to maximize the results of human labor
- Is a way of thinking, adaptability to change, to eliminate losses and continuous improvement
- There are many tools and techniques that, used together, maximizing human resource performance in industrial companies
7. JUST IN TIME METHOD (JIT)

Just in Time (JIT) is based on the idea that production activity must be calculated and designed with great precision so that inventories are minimized. It is a process-oriented and applied primarily to manufacturing firms, should occur only what sells and just in time

The principle of method:
Reduction or elimination of stocks minimum raw materials, parts, subassemblies, finished products lead to lower overall costs, regardless of production volume

Implementation method J.I.T. requires achieving the following fundamental actions:
- Location rational organizational links in order to reduce costs of operations that do not create value
- Reduce training time, made to achieve a timely change of series
- Achieve maximum reliability of the machines to reduce parking costs due to their accidental falls
- Achieving quality productions
- Carrying out quality control on the principle of "total control under selective screening"
- Creating a partnership with suppliers
- Education and training of the workforce using the most effective methods

JIT material flow
Two basic methods governing the flow of materials:
- Pull method (pull)
- A push (push)
The "pull" method, management schedules allow reception of all raw materials and production begins, before knowing the demand.

Advantages of JIT method
- Reduce costs by reducing inventories, reducing scrap, reducing the work and reduce changes from the original design;
- Increase revenue by improving product quality and increase sales.
- Reducing investment, both by reducing storage space and minimizing inventory;
- Improve the personal labor is very well prepared, motivated material attached to the results of the company and responsible work
- Sizing ranges of products undertaking to develop new products, in accordance with requirements market

8. TOTAL QUALITY MANAGEMENT – TQM

TQM - is a complex process that causes a continuous quality improvement of product/services to meet customer requirements in the context of increasing labor productivity and profit industrial organization.

TQM principles method:
By introducing the notion of total quality optics has changed throughout the organization in quality:
- Replacing the periodic verification of product quality preventive control
- Introduction of quality at the micro level, method"zero defects"
- Quality should be provided and certified the rules recognized/valid international ISO

TQM implementation plan includes:
- Specifying the tasks of top managers;
- Appointment of a committee to adapt TQM system;
- Appointment of a coordinator of implementation;
- Detection of human and financial resources;
- Establishment of company quality policy;
- Inform all employees;
- Start training and preparing action as to the whole company;
- Start of first quality improvement projects

**Benefits of TQM method:**
- Require innovation, flexibility and financial potential
- Strengthen employee motivation and creativity, thus creating the potential for greater innovation
- Enable better mastery of the processes in planning, design, distribution
- Result getting high quality products and services, timeliness of delivery, all at competitive prices
- Create conditions for the even the manufacture, ensuring proper use of production capacity and reduce costs
- Ensure strengthen market position
- Management is a new business approach
- Planning and organizing production
- Organizing events

9. **Post-sale activities**

Offering sales and service solution complete and integrated modern methods production set, allowing sales department to effectively manage the entire cycle of orders, and all activities post-sale, providing thus delivering orders on time and efficient management of all female dogs distribution. Thus, we obtain reduce operational costs, acceleration, stimulation productivity and increase sales, fund improvements in satisfaction customers. Applications include a wide range of customer oriented processes - the distribution and sale of products and professional services management requirements for service, warranty and returns, production and operations management, in production management, offers project case studies and economic.

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**Fig. 4** The total quality management in industrial companies
12. CONCLUSION

The central concept is the enterprice organizational sustainable in which the corporation is building in partnership with stakeholder processes and mutual relations. Modern techniques but effective techniques but effective manufacturing (Lean Six Sigma System, Lean Process Principles, Just-In-Time Production, Total Quality Management) it is envisaged that modern, flexible, able to lead to outstanding performance by eliminating waste and reducing costs representing the safe way to excellence. Implementation of standards these methods proved to be a program that works and can be adopted not only production but also in services. Customer requirements are for an existing industrial esentiale. If we look at society and the environment as final customers of any organization, it makes sense and optimization efforts in terms of sustainability. The company may record the following types of costs: the cost of pollution, waste, accidents, interruptions of transportation or communication paths, and if they are identified early design phase could be minimized.

11. REFERENCES

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