



How Wastes Influence Quality Management

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ABSTRACT

Companies are often surprised to learn that only a fraction of their activities actually add value for their customers. A primary cause of waste is information deficits – employees simply lack the knowledge they need to do their jobs efficiently and effectively. This leads employees to waste valuable time and motion searching, waiting, retrieving, reworking or just plain future action. Companies are able to respond to changing customer desires with high variety, high quality, low cost, and with very fast throughput times. Eliminating waste along entire value streams, instead of at isolated points, creates processes that need less human effort, less space, less capital, and less time to make products and services at far less costs and with much fewer defects, compared with traditional business systems. Companies are able to respond to changing customer desires with high variety, high quality, low cost, and with very fast throughput times.

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1. Introduction

To manufacture quality products or provide services at competitive prices is essential to survive in today's business climate. We are forced to look for better ways of doing things on continual basis. To meet customer's needs - on their schedule - requires (high) availability and reliability of equipment and systems when they are needed. In the maintenance and reliability field, professionals are constantly challenged to implement the best way to ensure equipment is available as and when it is needed at a reasonable cost. These are called best practices, but it is not as simple as putting something into effect. To truly realize a best practice requires learning, re-learning, benchmarking and implementing better ways of ensuring high reliability and availability of equipment and systems. Any system performance improvement processes in an enterprise, and more lean manufacturing particularly is effective when internal processes are stable and controlled [3]

For this reason, companies wishing to become or to stay competitive, they need competent persons in the planning and control processes, but also identify specific methods for improving internal coordination change. It is evident that the development needs economic performance is about upgrading the skills and human resources areas such as: labor organization, design-sizing-measure-control- improvement - management of business processes, quality management, change management, risk management, project management, with direct consequences on labor productivity and competitiveness performance [2, 5]. Some companies have already made a beginning by introducing and certification systems quality management, known as reference standards for these systems focus on identifying key processes and process leaders [14]. The organization and methods correctly sized is designed initially planned performance level and process control. To pass on a new level of performance it is necessary to apply a continuous improvement procedure the results obtained [12].

Role of finding appropriate methods of improvement to be played a level of organization process improvement specialist which can find methods to increase performance achieved by addressing issues organizational, technical and economic [7]. Lean Manufacturing and the system provide principles and the tools useful for improving the performance of firms [10], the core idea is to maximize customer value while minimizing waste. Simply, lean means creating more value for customers with less resource. A lean organization understands customer value and focuses its key processes to continuously increase it. The ultimate goal is to provide perfect value to the customer through a perfect value creation process that has zero waste.

To accomplish this, lean thinking changes the focus of management from optimizing separate technologies, assets, and vertical departments to optimizing the flow of products and services through entire value streams that flow horizontally across technologies, assets, and departments to customers. Eliminating waste along entire value streams, instead of at isolated points, creates processes that need less human effort,

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less space, less capital, and less time to make products and services at far less costs and with much fewer defects, compared with traditional business systems. Companies are able to respond to changing customer desires with high variety, high quality, low cost, and with very fast throughput times. Also, information management becomes much simpler and more accurate.

2. Research method

The 7 classic tools used in quality management was applied Pareto charts, Iskikawa, PDCA and Kaizen methodologies, to solve chronic problems, to obtain information and identify the production process for a small Romanian organization. We also used, Total Production Maintenance (TPM) to identify and reduce or eliminate losses, finding solutions improvement of working procedures and instructions. Apply process improvement methods it was possible to collect and to analyze data to solve problems and identify for continuous growth process performance [8].

We have send time in the field studying organizations, interviewing managers and employees, and directly observing the TQM, TPM process and its effects with purpose of identifying the critical economic and organizational components that contribute to its success or failures. We cannot remedy all organizational short-comings, and it does not generate value for all firms.

Indeed taken separately, we identify the needs for [2]:

- A) customer: improving customer service, reducing lead-times to customers, enhancing quality (CTQ).
- b) Operation: reducing cost, eliminating waste, improving productivity.

Tools and processes allow team members to leverage their knowledge and creativity to design an efficient workplace: right tools for the job, organized systematically and consistently

The scheme present the methods which can provide monitoring and measurement tools to maintain the improvements, and can be used for continuous improvement, seeks to eliminate waste and to obtain immediate improvement, not optimizing long term.

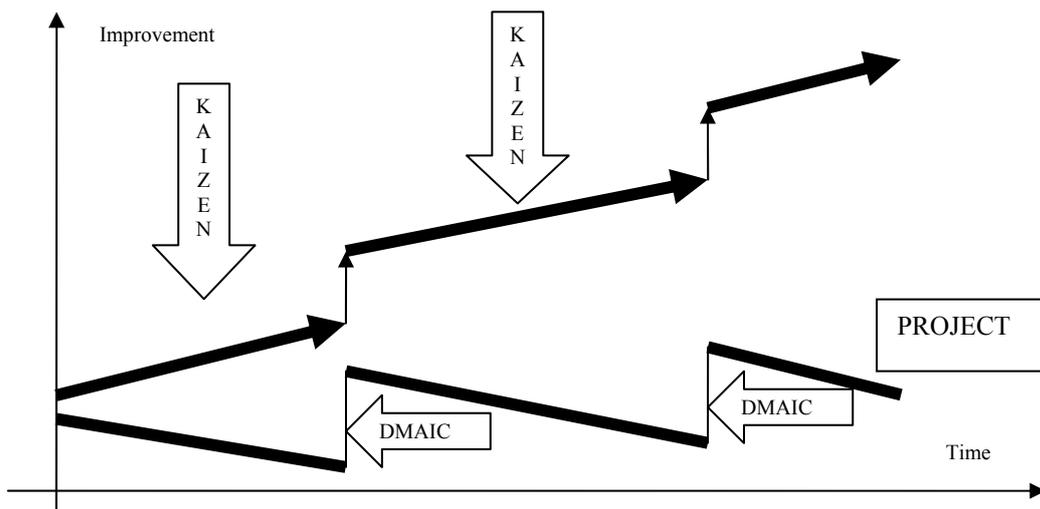


Figure 1. Large projects with big impact that lack sustain therefore backslide overtime

3. Research hypotheses

The tools used at the data analysis stage include diagrams, histograms, Ishikawa diagrams which graph the frequency distribution of factors causing problems under study (figure 2).

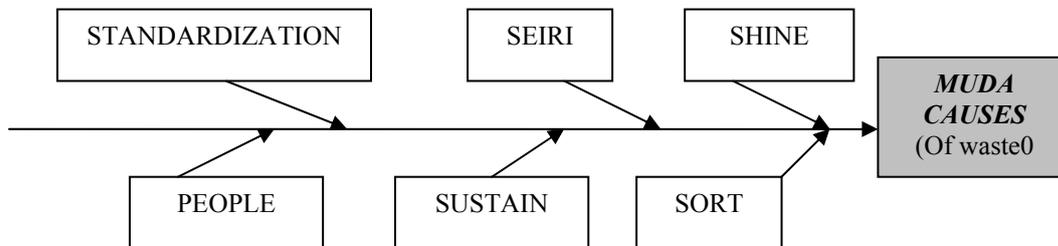


Figure 2. Fishbone diagram for waste causes

This data driven approach employee to prioritize alternative hypothesis and focus scarce organizational resources on eliminating important, correctable causes of a problem. How the concept of continuous improvement is beneficial only in cases where there senior management commitment and involvement to support these efforts is within an organization need to be position process improvement manager which have

the role of managing a system so organized to address and continue solving the problems encountered during the current activities to allow continuous improvement of the results:

- reduce consumption and costs increase productivity;
- reduce delivery time;
- increase flexibility in meeting customer requirements, etc.

The investigation of quality management in organization present the element costs of poor quality which was identify like in table 1. The examples give a deep perception regarding the importance of direct and indirect cost made by organization with quality product, technological process and quality system.

Table 1. Poor Quality costs

A. COST ELEMENT		B. EXEMPLE
<i>C. Direct poor costs</i>		
Controllable poor quality cost	Prevention costs	Quality planning Test and inspection Auditing process Performing capability analyses Conducting design reviews
Results poor quality costs	Internal errors costs	Troubleshooting and repairing Design changes Downgrading Reinsertion and retest of reworked items
D.	External errors	Sales returns and allowances Service level agreement penalties Complaint banding Field service labor and parts costs incurred die to warranty obligation (service)
E.	F. Equipment poor quality cost	G. Not the equipment used to make the product, the tools used to measure quality
<i>H. Indirect poor quality costs</i>		
	Customer incurred cost	Loss pf productivity due to product or service downtime Travel cost and time spent to return defective product Repair costs after warranty period Backup product or service to cover failure periods

Taking in consideration for example only the material, we identify wastes in the production circuit, and finally the stocks with products can influence the organization activity because the stocks cover the losses in the manufacturing production. Once a problem has been identified, the first step was to create a causal hypotheses and theories generated in the brainstorming process and categorized using a cause effect diagram collected data and analyzed the stocks problem. Stocks cover losses in the manufacturing process, a deepest research from this point of view present the wastes iceberg of manufacturing process taking in consideration the way of technological process from material to the final product. We can easily identify the most important wastes in technological process (figure.3) who present the invisible wastes who affected the production. As we can see the long way from material to the final quality product it is influence by internal and external factors.

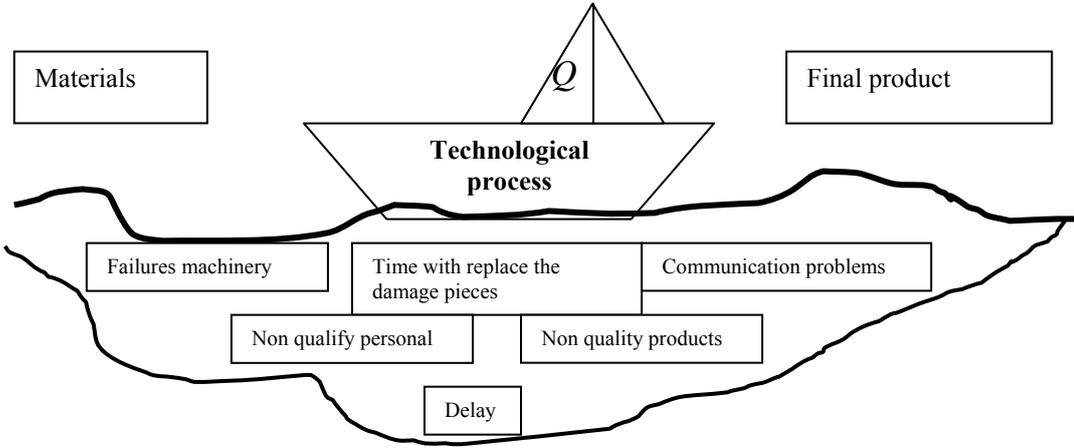


Figure 3. Stocks cover losses in the manufacturing process

4. Results

The 7 Wastes identify for production process are:

1. Delay – customers waiting for service.
2. Duplication – having to re-enter data, repeat details etc.
3. Unnecessary movement - poor ergonomics in the service encounter.
4. Unclear communication – having to seek clarification, confusion over use of product/service.
5. Incorrect inventory – out of stock.
6. Errors –in transaction, lost/ damage goods;
7. Opportunity lost – to retain or win customers.

Waste is anything that does not directly add to or support the creation of customer value.

If the value created by an organization is not perceived by the customer as valuable then the difference is considered waste. We can identify and note that expanding cost analyses to management and clerical workers could also make a significant dent in waste (Table 2)

Table 2 Cost analyses to management and clerical workers

FUNCTIONAL AREA	CONTROLLABLE	RESULTS
Controller	Timecard reviews Capital equipment reviews Invoicing reviews	Billing errors Incorrect accounting entries Payroll errors
Purchasing	Vendor reviews Periodic vendor surveys Follow up on delivery dates Strike built in costs	Line down cost Excessive inventory due to suppliers Premium freight cost
Administration	Security Facility inspection and testing Machine maintenance training	Disclosure of trade secrets Facilities redesign Overstaffing/understaffing Equipment downtime/idle time
Software	Design reviews Code reviews	Crashes Deadlocks Incorrect outputs
Marketing	Sales material review Marketing forecast Customer surveys Sales training	Overstock Loss of market share Incorrect order entry
Personnel	Prescreening application Appraisal reviews Exit interviews Attendance tracking	Absenteeism Turnover Grievances
Industrial engineering	Packaging evaluations Layout reviews Inspection of contract work	Shipping damage Redoing layout Paying contractors for poor work

Waste can also be produced directly by an organization at the same time it is creating value. Anything that is not considered to be value received by the customer is waste. If we suppose an error was made in a product or service, the question is:

Would the customer pay for errors production?

Customers prefer not to pay the price to produce an error, or the price to fix it. Both quality and organizational behavior review each element of waste as major impediments to performance improvement: creation of information, maintenance, use, storage and retrieval, disposition. Errors or defects are just one example of seven types of waste that can be created: effective goods, overproduction, waiting time, transport, inventory, emotion, non-Value, defects, under utilizing people:

Studying the fishbone diagram external and internal factors of influence we define some reducing waste (muda): transportation, inventory, motion, waiting, over production, over processing, defects, unused creativity.

We can present the following wastes results for production process: errors in documents, transport of documents, doing unnecessary work not required, waiting for the next process step, process of getting, approvals, unnecessary motions, backing in works queens, non utilized employees.

4.1. Study Case -In an administrative office

In an administrative office the study case present a lot of wastes from economical point of view, which can influence the entire office activity.

Defects: data entry errors, pricing errors, lost files or records, incorrect information on a report or document, on computers disc drive problems.

Inventory: office supplies, sales literature, new programs for design products, reports, letterhead paper.
None value added processing: re-entering data, extra copies, unnecessary reports, excessive reviews.
 What it is possible to reduce and to improve it is present in the following table 3.

Table 3: How we can influence the wastes

Reduced	Improved
<ul style="list-style-type: none"> • reduced paperwork; • staff stress; • overall operating costs; • inventory levels & costs; • engaged workers; • organized workplace; • better team work. 	<ul style="list-style-type: none"> • work flow; • productivity; • customer satisfaction (internal & external); • lead times (waiting times); • cycle times; • quality product.

5. Conclusion

A primary cause of waste is information deficits – employees simply lack the knowledge they need to do their jobs efficiently and effectively. Eliminating waste along entire value streams, instead of at isolated points, creates processes that need less human effort, less space, less capital, and less time to make products and services at far less costs and with much fewer defects, compared with traditional business systems. This leads employees to waste valuable time and motion searching, waiting, retrieving, reworking or just plain future action. Companies are able to respond to changing customer desires with high variety, high quality, low cost, and with very fast throughput times. Companies are able to respond to changing customer desires with high variety, high quality, low cost, and with very fast throughput times. The scheme from figure 4. present the methods which can provide monitoring and measurement tools to maintain the improvements, and can be used for continuous improvement, seeks to eliminate waste and to obtain immediate improvement, not optimizing long term. Cost of poor quality by inception point (Figure. 4)

The damages of poor quality augment as the inception point is farther down the supply chain: TCFP [Total Cost of Faulty Part] are:

DIRECT COST: manufacturing cost, failure at supplier's site;

+ LABOR COST = assembly and testing

+ OWERHEAD COST : inventory, handling, shipping costs;

+ SCRAPPING COST: of part and attached parts assemblies, sometimes assemblies cannot be disassembled and have to be scrapped all together;

+ REWORK : applying a new part instead, failure at manufacturer's site;

+ REPAIR COSTS: these are costs associated with repairing or replacing a new part, assembly under warranty;

+ PRODUCT LIABILITY COSTS: these are costs resulting from damages caused by the parties, failure at customers' site

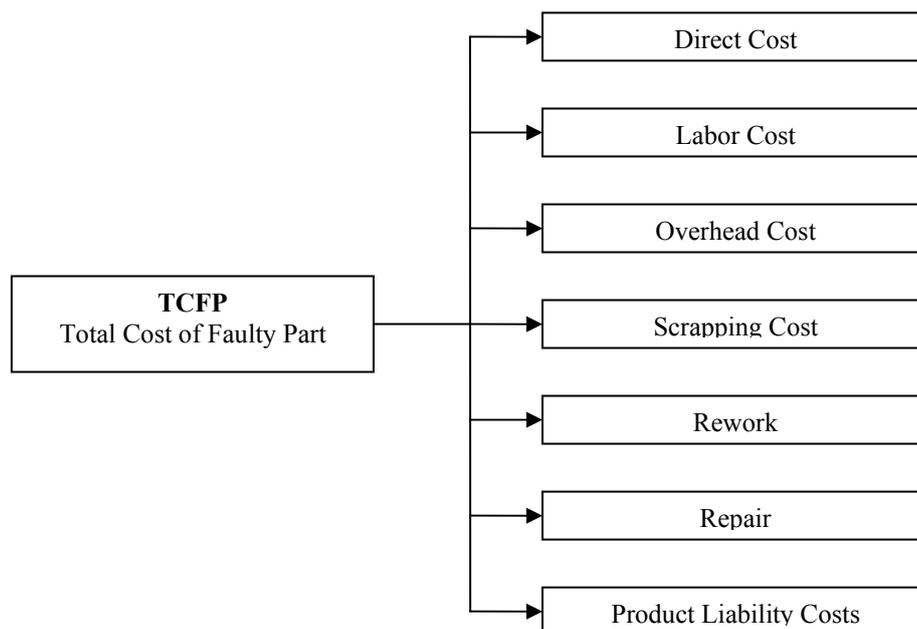


Figure 4. Cost of poor quality – TCFP (Total Cost of Faulty Part)

The new concept of organization of the future the new **manu**(facture) for **future** = manu-future will assure a successful implementation for quality management taking in consideration the new mantra, transform the reduce costs in high added values. The interdependence of the three elements: enterprise, process and product, who gives the golden pyramid of organization present the new orientation of research and innovation from: cutting cost to value adding, high performance models, people, customization, new business mode. Taking in consideration the developing management of organization it is evident that technologies are enabling to support manufacturing industry across many sectors by boosting their technological base.

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