Developing Innovative and Attractive CVET programmes in industrial shoe production

Train-the-Trainer Manual
- Quality Management

IO 3

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Content

1 Introduction

1.1 Aims of the DIA-CVET Project

The aims of the Erasmus+ project «Developing Innovative and Attractive CVET programmes in industrial shoe production» are

- to develop, pilot and implement comprehensive courses for the Spheres of Activity (SoA) of foremen in industrial shoe production on European level; available in English (EN) as well as in DE, RO and PT,

- and to develop a sector qualification framework level 5 and 6 and to reference existing or newly drafted national qualifications from Germany, Portugal and Romania.

1.2 Manuals to Guide Tutors and Trainers

The purpose of the manuals is to prepare designated trainers for their role and to provide content and support. Due to the nature of the SoA of foremen, they do not include specific forms of training; but we suggest a blended approach. Successful Continuous Vocational Education and Training (CVET) programmes combine theoretical lessons with application of the acquired Knowledge, Skills and Competences (KSC) in real work environments. The tasks of a trainer are to

- impart SoA-specific KSC,

- demonstrate operations which the learners are expected to learn to perform,

- introduce the learners to each new task and supervise them during their first approaches,

- organise and supervise blended activities (i. e. projects),

- guide them towards an independent performance of the tasks of the respective SoA.

The manuals are not meant to replace a textbook. They are meant to provide support to the trainers to plan and execute their teaching. The trainers are invited to gather more information from other sources.

1.3 Refer your training to the business process of industrial shoe production

Industrial production is a complex process, where the Sphere of Activity, described in this manual, is embedded in the business process. Before you start the training on a specific SoA, please make sure that the learners are familiar with the other SoA of industrial foremen in shoe production.

For example, the learners should be introduced to the types of products the company manufactures and their intended use, the different customer segments, the distribution channels etc. They should be aware of the product creation and manufacturing processes, i.e. product design, pattern making, purchasing department, production planning, and all production departments to warehouse and logistics.

The production process (not part of DIA-CVET, for insights see: http://icsas-project.eu/) is in the core of the business process; the SoA of DIA-CVET play a preparatory, supporting or accompanying role (see Fig. 1).
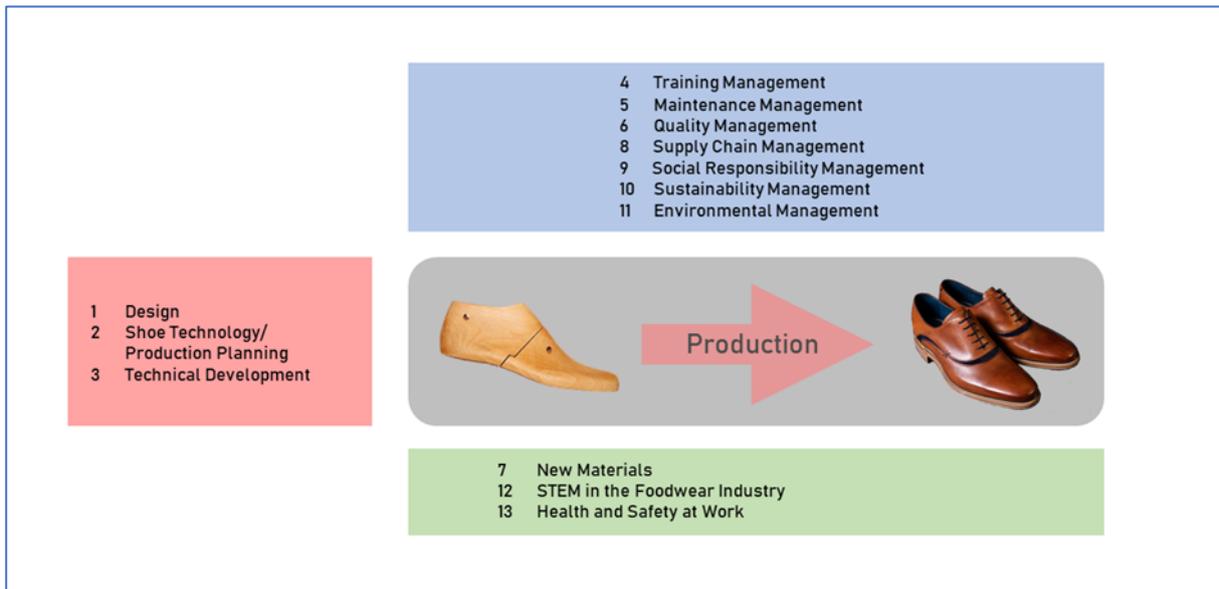

Fig. 1 Spheres of Activity of DIA-CVET and their relation to the production process.

2 Quality Management

2.1 Introduction

In an increasingly demanding market, organizations feel the need to increase their competitiveness through effective management and the satisfaction of stakeholders (customers, employees, shareholders, suppliers and the surroundings). The implementation and certification of quality management systems are strong allies in increasing the competitiveness of organizations.

Due to the multiple factors that affect quality, it should not be seen only from a technical point of view, but also as an integral part of management. Obtaining satisfactory results is only possible through a culture based on prevention, which promotes these values.

Models (standards), internationally recognized and duly tested, are defined for the definition and implementation of management systems. The ISO 9001 standard has been adopted by the most varied entities, in order to promote a better organization and management in that area.

By using this management model, the company can ask an independent entity to certify its individual or integrated management system.

The certification of one or more management systems means the recognition of good management practices in the respective certification area, serving as a "business card" with potential customers and the market in general.

The quality management system is geared towards customer satisfaction of the product/service, as such the quality management system certification standard is silent with regard to other areas, such as the environment or safety, except as strictly necessary. to guarantee the quality of the products.

However, an organization that has a certified quality management system will see the credibility of that certification lower if it is found to be performing poorly in terms of safety or the environment.

In this Manual, we will focus on Quality Management.

2.2 Fundamental concepts on Quality

All organizations (business, schools, hospitals, etc.) are committed to provide products or services to society. This objective is only successfully achieved if the products or services are generally able to meet the users or consumers with respect to price, delivery, and suitability.

If so, the product or service has a strong chance of being successful in the market. The quality of products and/or services is a determinant key of competitiveness, a situation that tends to worsen with an increasing competitive scenario.

As a consequence for companies, resulting in the need for continuous improvements in products and/or services and in shortening the development cycle and the launch of new products, responding not only to the increasing competition but also to technological innovation and the changing needs and expectations of users / consumers.

How can a company respond to these challenges? What an organization should possess to succeed in this field? Is it inevitable that a company should increase its costs to improve quality? Quality means costs or benefits?

How to define Quality?

The Quality has been generally defined as **fitness for use**. According to EOQC ("European Organization for Quality Control"), the Quality is the set of characteristics of a product (or service) that determine its ability to satisfy a given need.

This means that the product meets customer needs, i.e., the product is suitable to be used by the client: The fitness for use is related to the value that gives the product the customer and their satisfaction: The Quality is, therefore determined by the client and not by the producer.

The fitness for use of a product can be characterized by the eight dimensions of quality:

  1. Performance

Refers to the primary operational characteristics of a product

  2. Features surrounding

They are all secondary issues, things that are added to the basic products to attract customers

  3. Reliability

Respect to the period of time that a product can be used to undergo a breakdown

  4. Conformity

The quality of compliance means producing products according to the characteristics defined by those who conceived them. Therefore, it depends on technology, human resources and management systems. It's like to say "how well product/service meets customer's expectations"

  5. Durability

Able to perform or compete over a long period, as by avoiding or overcoming injuries

  6. Assistance

Respect to guarantees and repair or replace the product after it is sold. This service is related to variables such as speed, competence, courtesy and integrity. The customer expects that any problems will be solved quickly, in a satisfactory manner, with honesty and kindness.

  7. Aesthetics

Appearance, feel, smell, taste

  8. Reputation

Recognition by other people of some characteristic or ability

Depending on the type of product involved, each of these dimensions is very important, depending on the purpose for which it was intended.

From a global perspective, and as strategy, quality should have a double sense, ie, must be customer focused and should be also compared with the competition.

The Customer

"Quality is defined from the standpoint of the customer".

According to this principle, the customer has become the main target of the company.

But who is our costumer?

Ultimately it is the company or person who purchases our products. However, in the chain of acquisition, production and distribution is always present the concept of customer.

In the company, internally, the client may be the employee in a given post receiving the work from the colleague that precedes it in the production line, or the next department.

Externally, as often happens in the footwear industry, can be a retailer, distributor or importer. However, the company also must comply with contractual requirements, directly with the client, whatever it is, and cannot forget that it is the consumer who will decide whether or not to buy back again a particular product.

The business strategy adopted by the company has to take into account the harmonization of various interests involved.

To keep customers happy, whether internal or external, is necessary for the company:

- To Identify them correctly
- To know and meet their needs
- To comply with deadlines
- To provide ongoing support
- To listen to their criticisms and make the corresponding corrective actions.

To meet the clients' needs, it's required to obtain reliable information regarding:

- Type of product or service to be provided
- Their level of quality
- The amount/quantity
- The sale prices
- The intended market
- What is the position of the competition for the same type of product.

It is the quality of the product that creates and keeps customers and a satisfied customer is the best agent for promoting, the company may have. But the reverse situation can lead to high direct and indirect costs and often leads to irreversible situations of disbelief.

2.3 Quality / Production - level of "independence"

Quality is an obligation of all, it means that everyone should help to minimize the problems of poor quality, both in terms of preventing and at the level of detection.

However, someone has to hold the responsibility for deciding if the product that has a manufacturing defect, whether or not is ready to be sent to the client.

It is at this level that the issue raised is relevant. This person should be independent of production or may be someone from the production, for example, or the Director in charge of production?

Normally, the responsible for the production aims to carry out the orders within the time planned, lest the company be penalized for failing to meet delivery deadlines or incur higher than expected due to falls in productivity. Of course, he/her won't be apart from the quality set up to the product.

But common sense will be the production responsible to decide whether or not the product conforms to go to the customer? Is that so, in all situations? Will he/her be cold enough to make that decision? Or it may happen that, when a particular order is delayed, has difficulty in securing, with the usual clarity, the maintenance of manufacturing processes and quality control at the same level of effectiveness?

Experience tells us that the decision on the Quality of the product and its delivery to the customer should be the responsibility of someone who is not directly exposed to such pressures.

That person who will be independent of production then, will assume the duties of director of Quality at the company.

This independence of Quality relative to other sectors therefore directly dependent on top management is safeguarded by the existence of a Quality Policy, established by the direction (top management)

The Quality Policy shall contain:

→ Company's quality objectives
→ Commitment to Quality
→ Commitment to the needs and expectations of customers

The Quality policy must be clear and simple and distributed to all members of the organization. In this way, it ensures that all levels of the company know and understand the Quality Policy. It is the responsibility of the management company to ensure the implementation of Quality Policy and achieving its objectives.

2.4 Standards and their evolution

The series of International Standards related to Quality Systems is the ISO 9000. First, it should be noted that these standards are related to management activities and not to the specific technical activities.

These documents are a valuable guide to define the requirements to be met in the Quality System, to establish the organization and responsibilities and to document the system.

This series is divided into the following standards:

- ISO 9000: Quality Management Systems - Fundamentals and Vocabulary.
- ISO 9001: Quality Management Systems. Requirements.
- ISO 9004: Managing the Sustained Success of an Organization - A Quality Management Approach

The ISO 9001 standard, based on the PDCA continuous improvement cycle, indicates which requirements organizations must ensure with regard to quality management, however it is up to each company to determine the methodologies to be used to ensure compliance.

A quality management system implementation, according to ISO 9001, is a decision of the Top Management level of the company. Many companies all over the world have a quality management system to promote continual improvement. In consequence, a quality management system is a set of different activities and processes performed by competent personnel using available equipment and infrastructure to achieve customer satisfaction, as well as performance, goals, effectiveness, and efficiency of those activities.

Quality management requirements, according to ISO 9001:2015 are represented by the following clauses:

- Context of the organisation: determines external and internal issues that are relevant to its purpose and its strategic direction to achieve the intended results. For example, under the category of the external issue, we have from legal, technological, competitive, market, cultural, social, and economic environments, while in the internal context, we have topics related to values, culture, knowledge, and performance of the organization.

- Leadership: top management shall demonstrate leadership and commitment, policy compliance, and ensure responsibilities as well as authorities.

- Planning: determines the actions to address risks and opportunities, quality objectives, and plan the changes taking into account new contexts.

- Support: determines and provide the resources (such as people, infrastructure, environment for the operation of processes, competence, communication, and information).

- Operation: plans, implements, and controls the needed processes to meet the requirements for the provision of products and services. It includes the delivery of value through activities connected within a network of processes, operations related to products and services, meeting the needs and expectations of interested parties.

- Performance evaluation: the results from monitoring and measurement shall be analysed and evaluated. Performance indicators shall retain documented information as evidence of the results.

- Improvement: determines and selects opportunities for improvement and implementation of any necessary actions to meet requirements, goals, and the performance and effectiveness of the quality management system.

2.5   Approach to Management by Processes

Process control principles in the manufacturing industry consist of measurement of processes and products.

According to ISO 9001, the process approach:

- defines the network of processes and their interaction;

- considers the inputs and outputs of each process (on the internal or external level) and the interaction within as well as the interfaces on which processes need to control the effectiveness and efficiency of the sequence.

Each organisation determines the processes and actions needed to satisfy the compliance with the indicators.

Processes define interrelated activities and checks, to deliver intended outputs. The processes control satisfaction by meeting requirements**.**

What is a PROCESS? - A Process is a system of activities that uses resources to transform inputs in outputs. The added value during the process results in organized activities in a specific sequence according to a logic established flow and specific rules and procedures.

The following picture and correspondent legend clarify the concept described above:
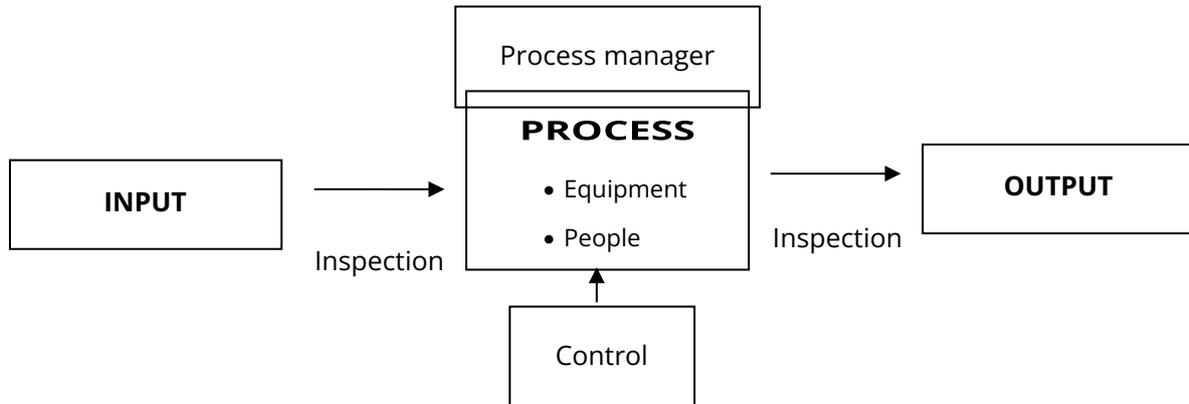
Legend – characterization by processes:

- Process manager – who is responsible for the management of the process
- Inputs – what triggers the process, needed elements to the process
- Outputs - Results of the process
- Performance indicators – allow the accompanying of the process
- Activities, related responsible and associated documents
- Range and requirements of the applied standard
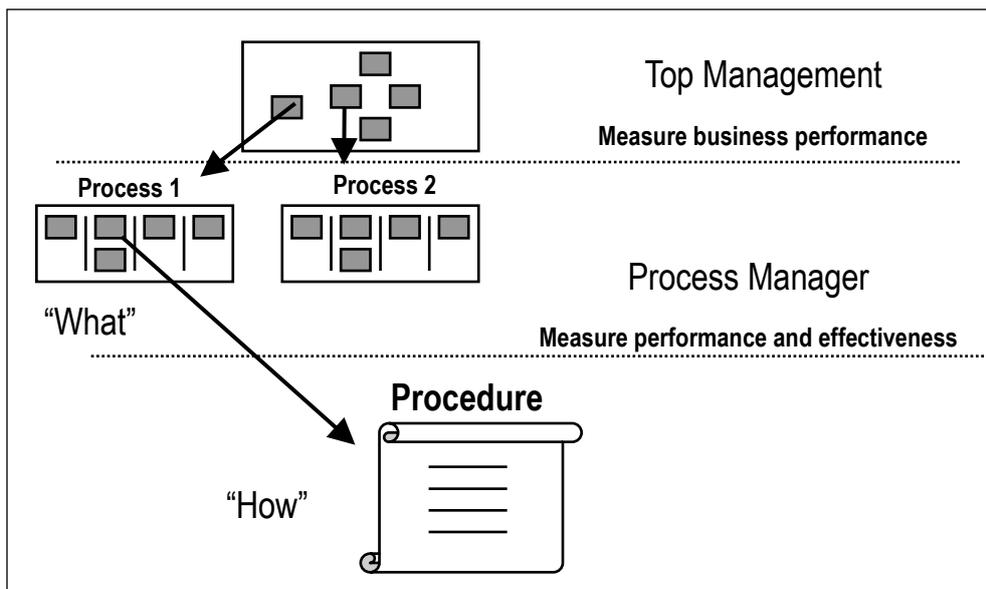- Interrelation between processes – origin of each input /destiny of each output

Fig. 2: Characterization of a Process

Which are the main differences between the traditional management approach and the Process Approach?
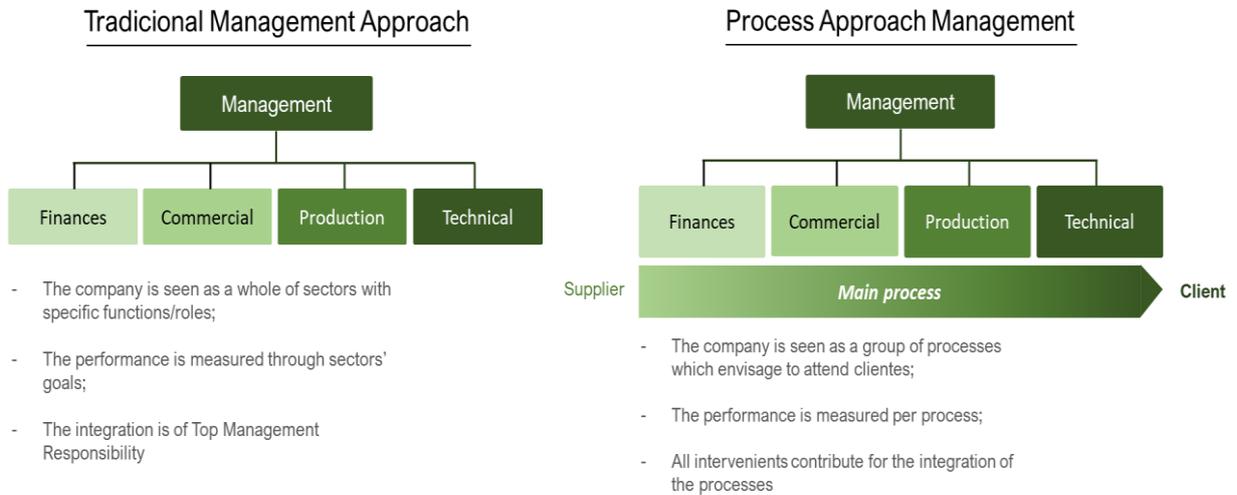
Fig. 3: Main differences between the traditional management approach and the Process approach

Organization of Processes

The following scheme will illustrate the organization of a chain of processes in a company and clarify each concept used:

STRATEGIC PROCESSES
Processes from which general action are produced.

VALUE CHAIN PROCESSES
Processes needed for the manufacturing of the products.

SUPPORT PROCESSES
Processes which support the key processes, including the needed processes for the effective implementation of the Quality Management System.

Process → Sub-Process → Activity → Task

Fig. 4: Example of the chain of Processes in a company

How to implement and control the Process?

The Process Approach uses the continuing improvement cycle – PDCA – as a support for its implementation in companies, as it is illustrated in the following lines:
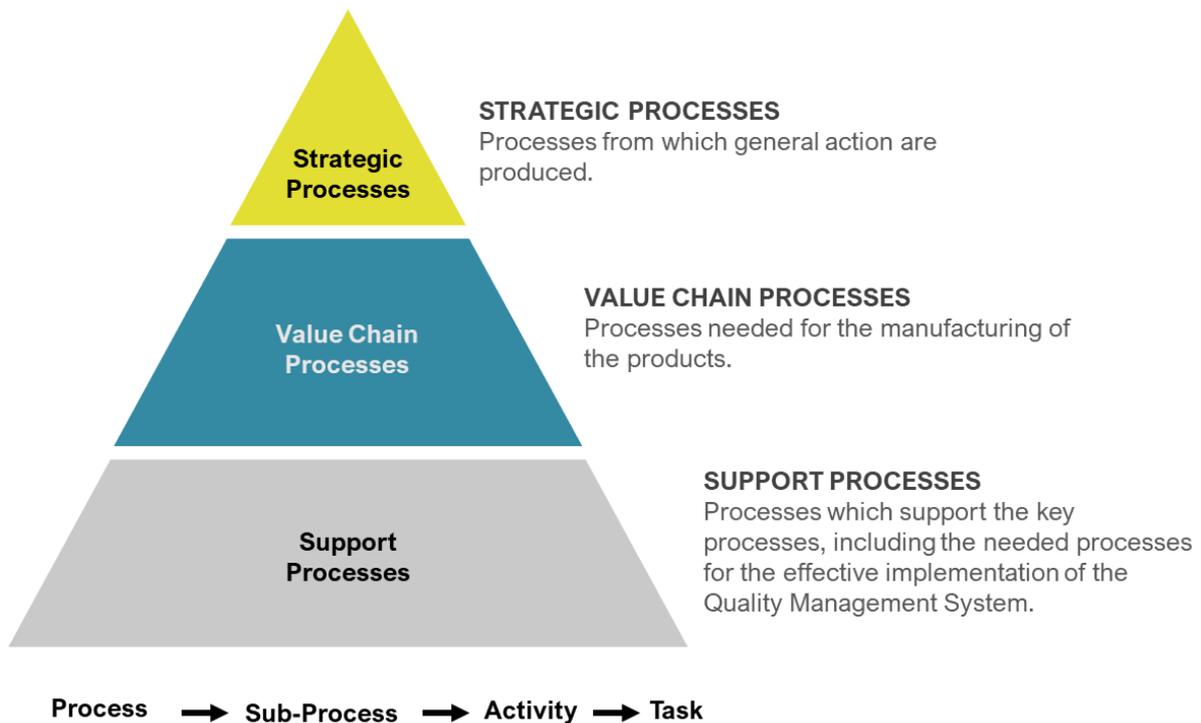
P - Planning	• Diagnosis of the performed tasks and their aggregation in activities
	• Identifying of needed processes for the Quality Management System (QMS)
	• Determining the processes interaction and their sequence
	• Determining the methods which assure the effective operation and processes control
	• Defining the indicators to be monitored:
	○ To identifying and characterize each process
	○ To analyse the influence of each process output in its destiny (processes or exterior)
	○ To determine indicators that reflect the process in a whole
	○ To align the indicator with the processes at a superior level
	• Setting up objectives to be achieved
	• Assuring the availability of the support information to operation and its monitoring
D - Doing	• Implementing the processes accordingly
C - Checking	• Measuring, monitoring and analysing those processes, comparing to policies, objectives and requirements addressed to the product and reporting the results
A - Acting	• Doing actions that envisage to correct deviations, comparing to set up objectives and process improving

Tab. 1: Continuing improvement cycle – PDCA

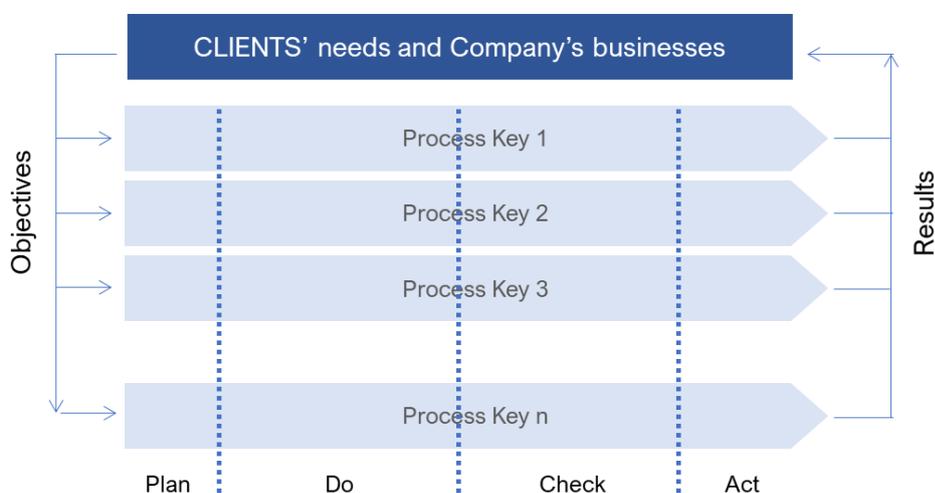The following scheme translates in an easier way the content of the table:

Fig. 5: Characterization of the PDCA cycle

The Process Manager's main responsibilities

- Definition / Elaborations / Updating of his/her process
- Implementation of the Process (to comply with and enforce other to comply with)
- Usage of the existing/predicted documentation
- Identification, analysis and accompanying of the performance indicators
- Planning how to achieve the defined goals for his/her process
- Take improvement actions

What are Objectives within the terminology of Process Approach?

Objectives are what the company/organization pretends to achieve, in a certain period. They can be:

- **General/Overall objectives** – Those which are accompanied directly by the top management, covering all company's sectors/departments;
- **Objectives by process** – Those which are defined for each one of the performance indicators addressed to every company's process. They allow following the performance of each process, being one of the used tools for the continuing improvement. Those are also accompanied by the Process manager and supervised by the top management.

For each objective (general or by process) action plans will be established, which will point out all necessary actions for their accomplishment, related deadlines and responsible.

The objectives must be SMART:

- S (**S**pecific) – Clear, concise, tangible - Make the goal a specific statement oriented for a defined aspect of company performance. The less specific you are the harder will be to understand and meet the wanted standards
- M (**M**easurable) – Quantifiable - Determine how the goal is calculated, which ratio is used. If you cannot explain how it is measures than you cannot evaluate performance.
- A (**A**ctionable / **A**chievable) – One must know "how" to achieve - Identify the expected outcome. Which variables must be worked / changed?
- R (**R**elevant / **R**ealistic) – Important for the company or Process performance. Ask to yourself: Can it be done? It´s achievable? It´s relevant? It worth's the effort and cost?
- T (**T**imely) – Time tabled - When must it be done? Establish a deadline if it doesn't exist yet.

For the planning of the objectives, the process manager has to answer the following questions:

- Who does what – to define responsibilities and actions/tasks
- With what resources – to address resources to each action/task
- When – to define timings/deadlines.

When a company implements a quality management system, it is providing a global and systematic approach to all activities that:

- affect quality - from product design to after-sales service;
- prioritize preventive activities rather than corrective actions;
- provide managers and clients with objective evidence that the desired quality is achieved;

- improve execution, coordination, and productivity;
- provide a greater focus on the company's objectives and clients' expectations;
- open up new market opportunities.

How to Map Processes?

The following scheme illustrates a complete process (in this case of purchasing):

	MANAGEMENT PROCESS PURCHAISING	GP/PA EDITION Nº: 1 October/2011

PROCESS	SCOPE	
MANAGER: Responsible for purchasing	Starting of the need of purchesing till the confirmation of the invoice and receipt, incluing management of the storehouse	

INPUTS: purchaising conditions — **Connections**

Inputs:
- Need of purchase
- Business opportunity
- Non-conform materials returned from Production

Connections:
- All processes
- Extern
- Production

#	Activity	Manager	Financ. Dir. (DAF)	Commercial Dir. (DORD)	(DSL)	Purchase Dir. (STRH)	Design/Product Eng (ENG)	Production dir. (PLA)	(MAIN)	(CUT)	(STIT)	(ASS)	(FIN)	(PACK)	Qual. Dir. (QC)
1	Needs of purchasing - materials, packages					X	0								X
2	Needs of services aquisitions								X						X
3	Needs of purchasing equipment / tools / software	X				0	X				0				0
4	Sellection of supplier/ Approved Suppliers List					X									0
5	Market study for new need of materials / suppliers	X				0									
6	Market study for new need of equipments / services	X				0	0		0						X
7	Spplier request emission					X									
8	Reception of materials/Confirmation of agreed purchasing conditions					X									X
9	Inspection and tests of materials reception					X									
10	Inspection and tests of packages reception					X									
11	Inspection and tests of packages reception (boxes, others)														X
12	Inspection and tests of tools reception (cutting devices, etc.)								X						
13	Inspection and tests of services reception								X						X
14	Identification / segregation of non-conforming raw materials					X									X
15	Register and inspection of services reception								X						X
16	Classification in the data base, of the supply					X									X
17	Codification of materials					X									
18	Identification of materials					X									
19	Storage and control of storehouse conditions and preservation					X									X
20	Stock management of materials					X									
21	Identification and preservation of client property					X									
22	Confirmation of invoice		X			X									
23	Reclaims/ Returns to suppliers					X									0
24	Classification/Qualification/Assessment of suppliers					X									X
25															
26															
27															
28															
29															
30															
31															

OUTPUTS	Destination Process	Notes
Raw-materials; Packings; Tools; Equipments; Software; Hardware; Services Reclaims/returns to suppliers	All processes Extern	x - Responsability 0 - Colaboration ▢ - Management intervention

PERFORMANCE INDICATORS

Description	Characterization
Accomplishment of raw-materials Quality (% RM non-conform)	(Non-conform raw materials/Nº supplies)*100
% Suppliers with classification A, B or C	(Nº suppliers with classification A/ total Nº of suppliers)*100
	(Nº suppliers with classification B/ total Nº of suppliers)*100
	(Nº suppliers with classification C/ total Nº of suppliers)*100
% Reclaims to Suppliers	(N.º reclaims to suppliers/total N.º of supplies)*100

Elaboration	Validation	
		Page 1 of 1

Tab. 2: An example of a process mapping (purchasing)

2.6 Application to Footwear

The following table illustrates the organization of Processes in a Footwear company to illustrate the application of the Process Approach in the implementation of a Quality Management System:

N°	Name of the Process	Range	Indicators	Process Manager
01	Management	Setting up guidelines for the company management	Level of accomplishment of the set up objectives Reduction of fixed costs	Administration / Top Manager
02	Client	Reception of the order till delivery, invoice and post-selling service	Sales Customer satisfaction	Commercial Dep.
03	Design / Product development	Product development till the total product definition and operation flow	% of approved prototypes	Technical staff
04	Supplies	Supply need request till the storage of the materials and paid invoice	% of returns to suppliers	Supplying Dep.
04.1	Store house	Reception and control of the materials till their storage	% of the accepted supplies out of the specification	Store house Resp.
04.2	Outsourcing finished product	Supply request till reception control	% reclaimed subcontracted product	Commercial Dep.
05	Manufacturing	Setting up production management and control rules/specifications, from the planning and preparation of materials, till expedition	Average production per day	Production Dep.
05.1	Cutting room	Reception of materials till delivering of cut product, prepared and controlled to stitching room	% non-conform product	Cutting room foreman
05.2	Stitching room	Reception of cut pieces till delivering of uppers to assembling room	% non-conform product	Stitching room foreman
05.3	Assembling and Finishing room	Reception of uppers and bottom materials till delivery of finished product to expedition	% non-conform product	Assembling / finishing room foreman
06	Human Resources	Setting up rules for HR management	N° work accidents Training Plan accomplishment level	HR Dep.
07	Maintenance	Setting up rules for maintenance (from planning till its implementation)	Overall maintenance cost	Maintenance Dep.
08	Quality	Setting up rules for the structure of Quality Management System	% of non-conformities in the auditing report	Quality Director

Tab. 3: Example of the organization of Processes in a Footwear company

2.7   Tips to Continuous Improvement

10 Tips to improve the Quality Management:

1. To save on quality is to increase the cost of poor Quality. Investing in Quality means lower costs.

2. Quality is never an accident! Always results from an intelligent effort

3. Quality should be programmed according to customer needs.

4. It is better to throw out a bad product which is designed to a good customer than to throw away a good customer because of a bad product.

5. There is only one way to do. To do well!

6. Create methods, implement them and control their implementation until they become a routine … Only then is possible to stop controlling them.

7. A return bothers more than a thousand words to whom caused the defect.

8. The quality of our product begins in the company of our suppliers.

9. It's easy to blame the failure of our material, because it doesn't complain.

10. We can always improve what we do.

3 Conclusion

The development and implementation of a QMS should be focused on the organization's culture and its needs. To this end, the following steps should be considered:

- Determining the needs of customers and other interested parties;
- Establishment of the organization's policy and objectives;
- Definition of the processes necessary to comply with the organization's policy and objectives;
- Establishment of operational control methods for processes, including means of preventing non-conformities. The greater the degree of risk associated with non-conformities, the greater the associated means of prevention.
- Establishment of methods for measuring the efficiency and effectiveness of each process.
- Continuous improvement of the QMS.

To avoid non-conformities in audits, it is important to mention that the implementation of a Management System must comply with 3 fundamental rules: "say what you do" and in practice "do what you say", always being able to "demonstrate how you do it".

4   List of Figures and Tables