Marco Currò
Moni Srl

Marco Currò is the owner of MONI srl and of M2Casting, businesses manufacturing jewellery and semifinished micro cast pieces in the gold district of Valenza.
Over the years he has had various periods of professional experience outside Italy, as production consultant at the Indian and Chinese plants of an Asian group.
He currently takes care of planning and production process quality for his own companies.

Implementation of the UNI EN ISO 9001:2008 quality management system in a gold industry SME. Application of an integrated system that meets the standard quality requirements of processes, material traceability, ethic requirements and respect for the environment.

This paper discusses a company case history that highlights how company problems, critical issues and inefficiencies have been corrected and managed through a monitoring and control system for company processes. Going through the whole certification process will include the moments involving management and whole staff during the stages in which roles and positions were redefined and processes created. There will also be an outline of the effects of quality manual application on the whole organization, starting from the initial situation to the period after the implementation of the system.

Implementation of an ISO 9001:
2008 quality system in a gold sector SME

Marco Currò

MONI srl , Valenza, Italia

INTRODUCTION

The adoption of a quality management system should be a strategic decision for a company organisation, the purpose of which is to improve processes and boost customer satisfaction.
This introduces the subject of this paper, which goes through the whole process required to meet the requirements and achieve conformity with the ISO 9001:2008 standard.

The definition of the standard itself is the main reason, together with others to be mentioned, behind our setting out on a path lasting a year and involving the whole staff, redefining the entire company structure and its production supply chain, integrating or even completely replacing procedures with shortfalls with other formalised, well defined processes.

In this respect, it has been useful to look further at certain subjects and to answer some fundamental questions:

•   Why introduce a quality management system according to UNI EN ISO 9001:2008 standards?
•   Why not redefine processes and create procedures from outside the standard environment?
•   What does an organization need to do to implement this transformation?
•   What results does a business expect from a so-called "process" management and improvement approach?
•   Which consultant needs to be appointed to work with management for certification?
•   How is the application of a quality management system affected by the reduced size of an SME?
•   How should a structure be prepared for an integrated system that also meets with environmental and ethical requirements?

Looking at these questions has helped to clarify and understand the subjects to be dealt with and the route that the business should take in the coming months, together with its consultant and the staff.

DEFINITION, CHARACTERISTICS AND BRIEF HISTORY

ISO 9000 is used to identify a series of standards and guidelines developed by the International Organization for Standardization (usually abbreviated as ISO), which defines the requirements for the design and implementation of a quality management system to define and perform processes and improve efficiency in product manufacture or service provision.
This is aimed at improving client satisfaction, in full compliance with client requirements.
ISO represents national standardization bodies for 163 countries; it was founded in 1947 and although it is an NGO, it has the capacity to define standards that become law through agreements and treaties the world over.
The full name of the standard implemented in Italy is UNI EN ISO 9001:2008. This is because in 2008, the international standard was harmonised, published and disseminated by the UNI, the acronym for the Italian National Unification body, a private not-for-profit association with standardization functions in all areas of industry and business and which, recognised by the EU, represents Italy in standardization activities with the ISO.

The ISO 9001 is therefore a universal standard that can be applied in any business, whatever the size or sector; in fact it defines the general principles that the company needs to follow but not the way in which products need to be made or services need to be provided.
From this viewpoint, a regulated procedure guarantees full monitoring of the process, making it possible however, to identify its strong and weak points in the long and short term.

This initial analysis is fully compliant with some of the initial points we set, and it stresses how ISO 9001 is indisputably the standard of reference for those wishing to subject their own production process to quality control overall, in a constant, thorough manner.
If the client is satisfied by the provider of the products or services sold, in terms of aesthetic and functional quality requirements, then a status as certified company extends this guarantee to the quality of the whole production cycle.

This guarantee is also universally recognised, giving the company more credibility than businesses without certification.

We have looked at other aspects that may shed light on other questions.
Firstly, I wanted to look as much as possible at the story of some SMEs or industries that are well known on the Italian industrial panorama. It immediately emerges that many of them had an image and a structure that was very different to their initial one, subsequent to their following a virtuous course of certification.
They have in fact laid the foundations for sustainable growth, standardizing their whole flow and improving processes by inserting procedures set down in standards and clear operational instructions and guidelines.
At this stage the roles and skills indicated in the organisation chart and job descriptions in the manual have been properly defined.

Of course, many other companies have been able to equip themselves with a very efficient organization and effective governance without undertaking any certification process, but although they perform well in the market, they still have to deal with the limit of not being able to offer clients a certified quality process, compliant with an international standard; i.e., they may use processes that are close to or even the same as those in the standards but without any official recognition.
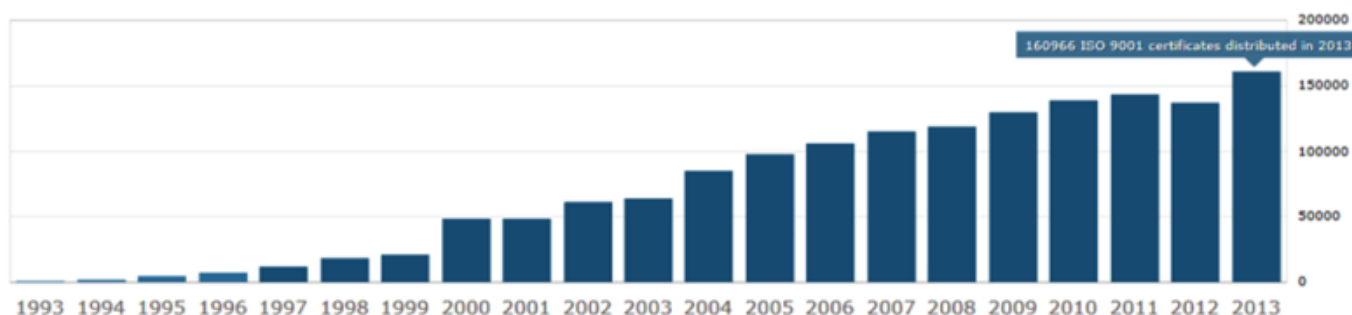This has at times been a limit to entering some markets or to laying solid foundations in relations with new clients from the outset.
However there are businesses in which the wish to undergo regular, in-house self-assessment processes is already common practice and this is naturally one of the main characteristics when it comes to undertaking a certification process.

Consultation of the data that the ISO publishes annually in its ISO Survey, i.e., which highlights world trends in certification achieved according to product market, has been of great assistance.
Please see the data in the graph in figure 1, tables 1 and 2.

EVOLUTION OF ISO 9001 CERTIFICATES IN ITALY

GRAPH 1

WORLD DISTRIBUTION OF ISO 9001 CERTIFICATES IN 2013

FIGURE 1

TOP 10 COUNTRIES FOR ISO 9001 CERTIFICATES - 2013

1	China	337.033
2	Italy	160.966
3	Germany	56.303
4	Japan	45.990
5	United Kingdom	44.585
6	Spain	42.632
7	India	40.848
8	USA	34.869
9	France	29.598
10	Brazil	22.128

TOP 10 COUNTRIES FOR ISO 9001 GROWTH - 2013

1	Italy	23.975
2	India	12.248
3	USA	8.692
4	Germany	4.602
5	Australia	3.938
6	Colombia	3.510
7	China	3.163
8	Taipei, Chinese	2.578
9	Indonesia	2.498
10	Greece	2.497

TABLE 1

TOP FIVE INDUSTRIAL SECTORS FOR ISO 9001 CERTIFICATES 2012 - 2013

		2012	2013
1	Basic metal & fabricated metal products	115.731	116.602
2	Electrical and optical equipment	56.303	87.797
3	Construction	45.990	80.920
4	Wholesale & retail trade; repairs of motor vehicles, motorcycles & personal & household goods	44.585	73.167
5	Machinery and equipment	42.632	63.497

TABLE 2

It is evident that the trend favours the tendency of businesses to want to certify their quality system in favour of clients and the marketplace, and how Italy is moving in this direction.

Other elements worth looking at definitely include the impact that we needed to foresee when implementing the system within a small business, which of course deals with the limits of fewer human and economic resources.
If initially we felt that ISO certification was the prerogative of larger, more structured companies, it soon become evident that this limit is often the result of a lack in business culture rather than the actual resources available to the company.
To this regard, the choice of consultant was essential. I opted for a professional able to address a company structure that was still very fragile and with great attention and patience, create a quality management system, often coming up against resources that were neither very reactive nor very prepared, and also habits that had become deeply rooted in the existing structure.

The last element considered was the need to undertake courses that could give the company international certification in the industry with regard to environmental and ethical requirements, i.e., to draw up and apply an integrated system that would allow quality, environment and ethics to coexist.

An Integrated System is commonly understood as the adoption by a company of at least two management systems of the four best-know international standards listed below:

- Quality   ISO 9001
- Environment   ISO14001
- Safety   OHSAS 18001
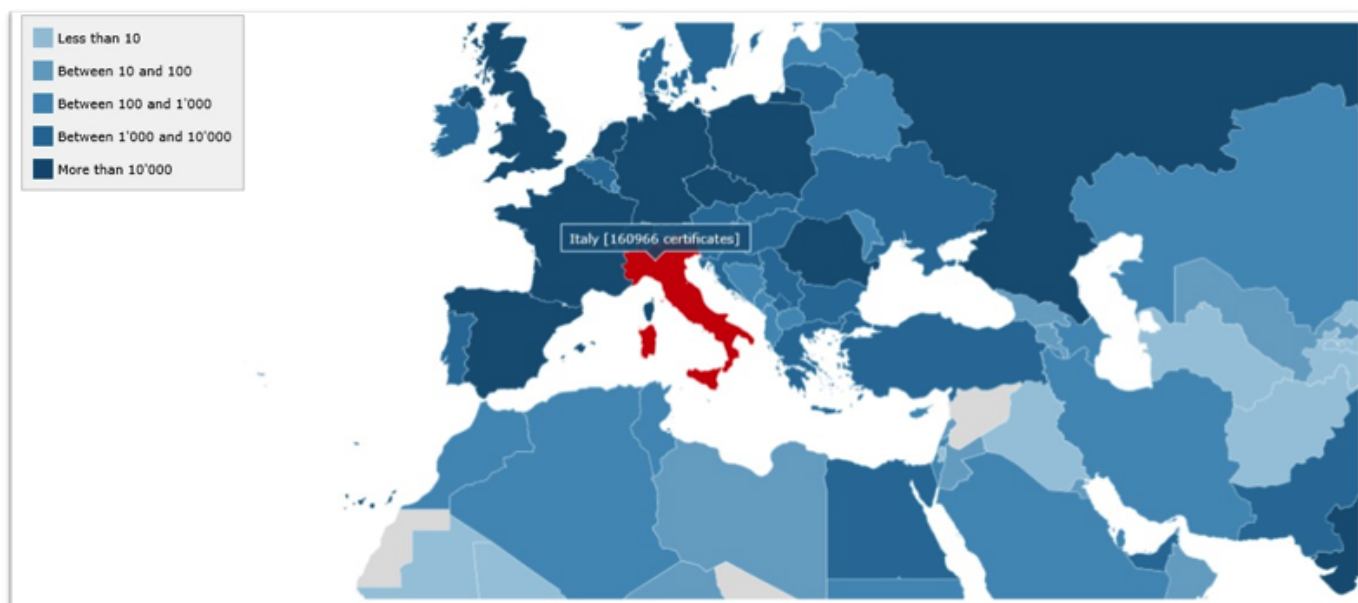- Ethics and Social Responsibility   SA8000

La nostra idea di fondo è stata invece quella di predisporre l'azienda a recepire con facilità e reattività i requisiti richiesti dalla certificazione internazionale rjc (responsible jewellery council) nei due schemi previsti e quindi progettare un sistema integrato come indicato di seguito:

- Qualità   ISO 9001
- Ambiente   rjc code of practice
- Etica   rjc code of practice

SYSTEM IMPLEMENTATION

The planning and implementation stages for the quality management system according to the ISO 9001 standard took the whole company organization along a well-defined course of action in which each single existing process was checked, analysed and improved.
International standards promote a "process-based approach" in the development and implementation of a system, with processes understood as being an activity or group of activities that, by using resources, allow incoming elements to be transformed into outgoing ones.
Therefore, excluding all of the binding activities (legislative framework and national and international standards) for our professional sector, it was necessary to integrate existing processes and adapt them, if necessary to suit standards, with other lacking processes well defined in the standard.

This completion or integration course can be identified with the sections of the standard itself and sums up our process of choice for achieving the certification.

See the points in question:

1. Scope and range of application
2. Quality management system
3. Management responsibilities
4. Human resources management
5. Product manufacture
6. Measurement, analysis and improvement

SCOPE AND RANGE OF APPLICATION

The first chapter in the international standard states that it is the standard itself that specifies the requirements needed to design a quality manual.
The implementation of a quality system serves to provide an organisation with the tools to demonstrate its capability when satisfying the standards required by the customer, increase the satisfaction of same, and activate a continued improvement mechanism as well as highlighting the way in which the business satisfies the binding requirements of its sector.

Although it may seem banal to focus attention on levels of client satisfaction, this type of approach immediately pointed out to us the need to build a system into which to insert a company vision. We also realised that although our primary aim was client satisfaction, we did not have the conditions or means to demonstrate why a result was achieved or why it was not achieved or always repeated.
Existing indicators showed data affected by the quality and correctness of information available and therefore, they were worth practically nothing.
Once the unsuitability of company processes was pointed out, together with the impossibility to classify existing procedures, the implementation of a QMS immediately corrected these critical issues by carefully monitoring company processes and operating procedures and instructions.
The same company vision became immediately more credible and achievable, and at the same time, it also made it possible to clearly identify company actions and the future scope and range of application for the certificate (e.g., manufacture of semi-finished micro cast pieces...)

QUALITY MANAGEMENT SYSTEM

If a company is to be able to design and keep a quality management system compliant with the international standards, the organization must be able to produce all of the documentation required for the correct planning, monitoring and measurement of each process.

The organisation must therefore:

• identify all of the processes that are useful for the production or delivery of the product/service internally and externally
• indicate the sequences and correlations existing between them
• identify the criteria and methods by which correct system operation is guaranteed
• establish the necessary indicators (kpi) to identify performance and measure defined targets
• identify the resources necessary to support all processes correctly
• where possible, monitor these processes in a manner that can be clearly measured for the purposes of complying with the requirements set by the client as well as those that are binding by law
• undertake actions for the purpose of achieving planned results and continued improvements

The essential documents to describe these steps are:

• Quality manual
• management procedures
• operational instructions
• control and recording documents

Overall, this documentation is an active tool through which a quality management system can be constantly monitored and measured. The production of this material was the most complex stage that our organization had to deal with.
First of all, identifying existing processes and analysing their contents immediately showed the shortcomings in some procedures which were not at all standardized or harmonized within the company organization, as well as that there was no real sharing of input-output by staff.
In some cases, process analysis also pointed out a lack of procedures since each staff member personalised their tasks without interacting with colleagues.
Once the macro stages of the company process were identified, it was coherent to increase the level of detail of this preliminary analysis with the aim of including the operation of the more complex activities of our company.

For example, the method for time measurement in the workplace, self assessments within production in the different production stages, and correct progress naturally required more attention than the filing and recording modes for documents rather than the acceptance procedure for a production plan from the client or a production proposal sent to a supplier.

An even more serious element that emerged during the initial stage, and which caused the system to stall for months was understanding the limits created by the existing personnel due to its inadequacy or propensity to take this new working method on board. Of course, without a well defined organization chart without overlapping roles or tasks between anyone or at any level, the system would never have stood up or been able to be activated in this context.
It is therefore useful to sum up and take another look at the turning point where the implementation of the QMS was able to correct the critical issues:

Once the key persons within the organization were identified, it was necessary to place them within a functional organization chart, defining roles and functions precisely and also stating the limits within which they could operate.
It was immediately necessary to correct all of the overlapping roles generated sometimes by the smaller size of the working environment or to the lack of business culture within some, as well as an old cultural heritage blocking the creation and formation of new company profiles that could serve the purpose.
The main aspects can be summed up as:

Period before the implementation of the quality system

• Many internal conflicts concerning the progress of production and human resources
• Strong interference among roles and many overlaps among same
• Lack of clarity in production or management flows with a resulting drop in productivity

Period after implementation of the quality system

• Definition of a clear functional organization chart
• Effectiveness of delegation at all levels
• Increased dynamism of staff and respect for roles
• Professionalization and formation of key positions
• Identification of present and necessary skills (Job description – planning of training activities)

Main effects on the organization

• Definition of a job description in line with company needs and the relevant self-checking activities
• Initial increase in in-house conflicts, managed and solved with the help of the quality consultant and involving human resources
• Cases of redundancy and resignation with relevant insertion of more suitable profiles
• Better company engagement

MANAGEMENT RESPONSIBILITY

In order to design a quality management system and implement it in a company, it is essential for the management to take a proactive role, constantly committing to increase efficiency.
For this purpose, key figures who had been identified and inserted into the staff quickly implemented input from the management and worked to correct processes, and to produce and make operational tools and procedures for this purpose.
At this stage of the proceedings, the effectiveness of delegation from the management was seen, allowing key positions to operate personally and for the first time, independently, in performing training and coordination activities

Please refer to the list summarizing the main areas of intervention:

• The management, together with function heads, worked to raise staff awareness and that of any outside suppliers, with regard to the real needs necessary to satisfy clients and applicable binding requirements.
There has been a considerable reduction in cases of product over specification or non conformity thanks to correct information flows among persons involved in the production or management of processes.
• The clarity of roles, improved communication and increased company engagement meant that the quality policy was quickly understood by all, allowing the management to plan a whole quality management system.
• Having defined quality aims that were obviously coherent and achievable, we created the tools to make it possible to proceed with a re-audit of the management to assess the real trends in the system and the corrective and preventive measures needed to make it more suitable and more efficient.

RESOURCE MANAGEMENT

In order to keep the system active and functional for the achievement of the proposed company aims, the organization will make resources (human, infrastructural and environmental) available,
As already mentioned, the first stage in allowing the company to approach the quality system allowed us to redefine the organization chart and with it, the precise job description.
Of course, the heads of departments and the staff they coordinate were subjected to precise training to transmit a business culture together with production know-how. Although training and education had been provided in-house, with regard to improving skills, we found that providing the same but within an ISO procedural framework produced greater results.
In fact, each training meeting became less generic and not only for the purpose of binding aspects but also in terms of aspects more in line with quality aims.
Each meeting was in fact studied so as to make subjects clearer to those who would then have to apply certain instructions, seeking to create a more participatory, proactive attitude by all staff. It was thus simpler to apply something that was not imposed by management but also shared with the staff concerned.
This answers one of the questions initially posed with regard to the path taken outside the outline of the ISO regulation.

Resources are also understood as being the area in which the identified processes take shape and are fed.
Among the many tools created during the completion of the processes examined, it is advisable to list the one mentioned in table 4, which refers to monitoring environmental and infrastructural quality.
More than others, this tool has brought about the collaboration of all staff since it provides objective and immediate information concerning the state of the environment in which each person is working, the company's commitment to improving working

conditions, as well as being an expression of their behaviour in the company.
For management it is also a valid tool to aid in understanding how far the organization is in line with the 5S logic of the Toyota method, subjects in which our company has been interested for some time.

	I.OP. 1 All. 1	VALUTAZIONE PERIODICA AMBIENTI DI LAVORO							
Moni GIOIELLI		AUDIT INTERNO (Data e punteggio min. 1 - max. 10)							
AMBIENTE / POSTAZIONE	**REPARTO**	**gen-15**	**feb-15**	**mar-15**	**apr-15**	**mag-15**	**giu-15**	**lug-15**	**ago-15**
Postazioni operative	UFFICI	8	8	8	8	7	7	7	8
Sala riunioni		8	8	8	8	8	8	8	8
Armadi e organizzazione documenti		7	7	7	7	7	7	7	7
Pulizia e ordine generale		8	8	8	8	8	8	8	8
Microclima e areazione ambiente		8	8	8	8	8	8	8	8
Postazioni operative	UFFICI PRODUZIONE	7	7	7	7	7	7	7	7
Sala controllo qualità		7	7	7	7	7	7	7	7
Armadi e organizzazione documenti		6	6	6	6	6	6	6	6
Pulizia e ordine generale		7	7	7	7	7	7	7	7
Microclima e areazione ambiente		8	8	8	8	8	8	8	8
Postazioni operative	INCASSATURA / LASERATURA	9	9	9	9	9	9	9	9
Postazioni comuni		9	9	9	9	9	9	9	9
Pulizia e ordine generale		9	9	9	9	9	9	9	9
Microclima e areazione ambiente		9	9	9	9	9	9	9	9
Postazioni operative	OREFICERIA	7	7	7	7	7	7	7	7
Postazioni comuni		7	7	7	7	7	7	7	7
Postazione acidi e lavaggi		6	6	6	6	6	6	6	6
Pulizia e ordine generale		7	7	7	7	7	7	7	7
Microclima e areazione ambiente		6	6	6	6	6	6	6	6
Postazioni operative	PULITURA	8	8	8	8	8	8	8	8
Postazioni comuni		8	8	8	8	8	8	8	8
Galvanica e lavaggi		7	7	7	7	7	7	7	7
Pulizia e ordine generale		7	7	7	7	7	7	7	7
Microclima e areazione ambiente		6	6	6	6	6	6	6	6
Sala ristoro / riunione	LOCALI ACCESSORI	9	9	9	9	9	9	9	9
Spogliatoi		8	8	8	8	8	8	8	8
Bagni		8	8	8	8	8	8	8	8
Magazzino materiali		5	5	5	5	5	6	6	6
Archivio		8	8	8	8	8	8	8	8
Locale manutenzioni		5	5	5	5	5	5	5	5
Locale packaging / lavanderia		6	6	6	6	7	7	7	7
Postazioni operative	CERE /FUSIONI (M2Casting)	8	8	8	8	8	8	8	8
Postazioni comuni		8	8	8	8	8	8	8	8
Ufficio		9	9	9	9	9	9	9	9
Sala fusioni		9	9	9	9	9	9	9	9
Sala gessi		10	10	10	10	10	10	10	10
Pulizia e ordine generale		9	9	9	9	9	9	9	9
Microclima e areazione ambiente		10	10	10	10	10	10	10	10
Punteggio medio raggiunto		**7,7**	**7,7**	**7,7**	**7,7**	**7,7**	**7,7**	**7,7**	**7,7**
Punteggio percentuale rispetto all'obiettivo aziendale (100%)		77%	77%	77%	77%	77%	77%	77%	77%

Table 4
Unfortunately, the resulting datum, objectively reveal areas for improvement on which to focus, some of which are the direct responsibility of staff, while others point to future areas of intervention for management.

PRODUCT CREATION

Once a functional, efficient organizational chart has been implemented and a regular training schedule defined for the purpose of improving the skills of each of us, we were thus able to lay the foundations so that the persons concerned could plan and implement the production process more efficiently.

Our company carries out job order processing that currently does not include product development stages.
This simplification has definitely helped in the stages for implementing the system, since we have only had to focus on the stages of executing production and on that of purchasing third party processing.

If a dispersion of information between client, and in-house production staff, quality staff and progress planning staff, became obvious at the outset, it has been possible to standardize the process so that information flows can be channelled only and always to those who are really concerned and involved.
Such a well-defined process definitely needs more time to be perfected, completely adapted to the company organisation with production activities becoming increasingly ordered and with fewer inefficiencies among the different stages, although the problems prior to the implementation of this system were corrected immediately.
The first indicator showing this improvement was an increase in turnover due to the reduction of cycle and lead times.

This can all be summed up in the three flow charts in figures 2 - 3 - 4 showing the standard initial flow and the one with the insertion and personalization of the position of Quality Director.
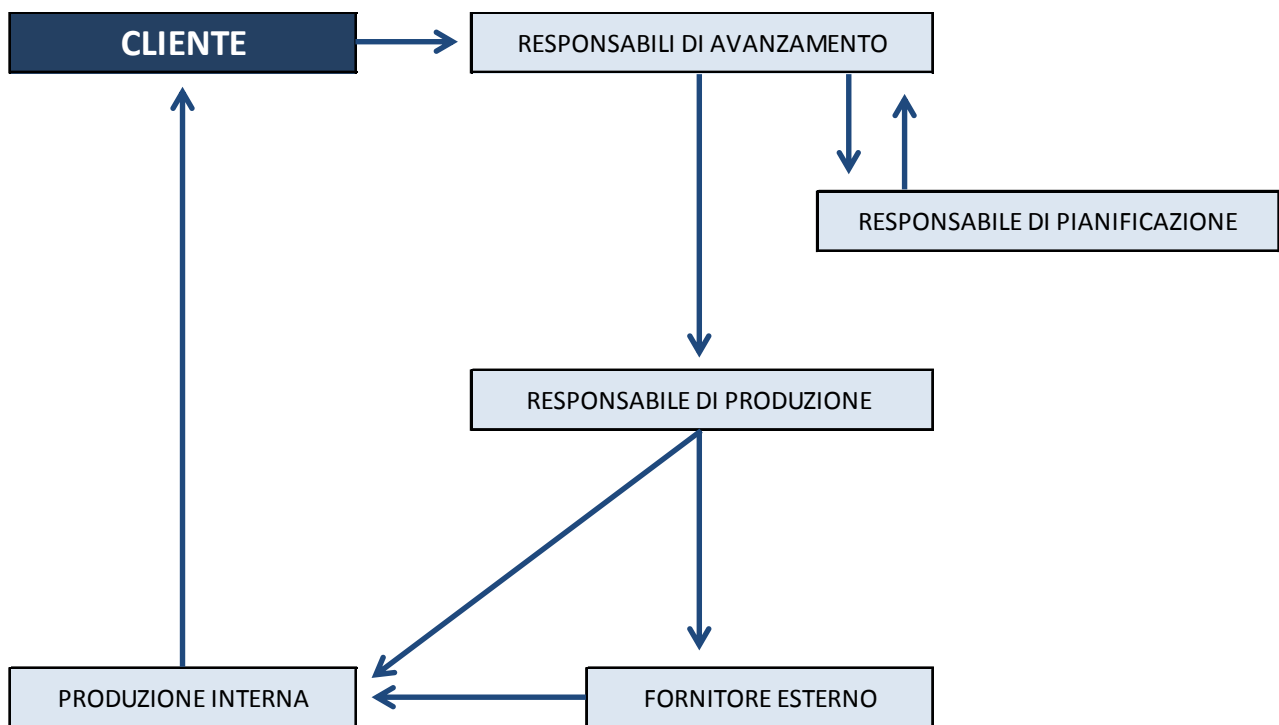

Figure 2 –Standard initial flow

Figure 3 (green arrows) show how the Quality Director, once professionalized and properly inserted into a production context, is able to receive or request aesthetic or functional input from the client, transmits to the Production Managers and ensures that they are complied with by internal and external production. The Quality Director defines the criteria for monitoring internal and external production and authorises dispatch of the jobs produced.
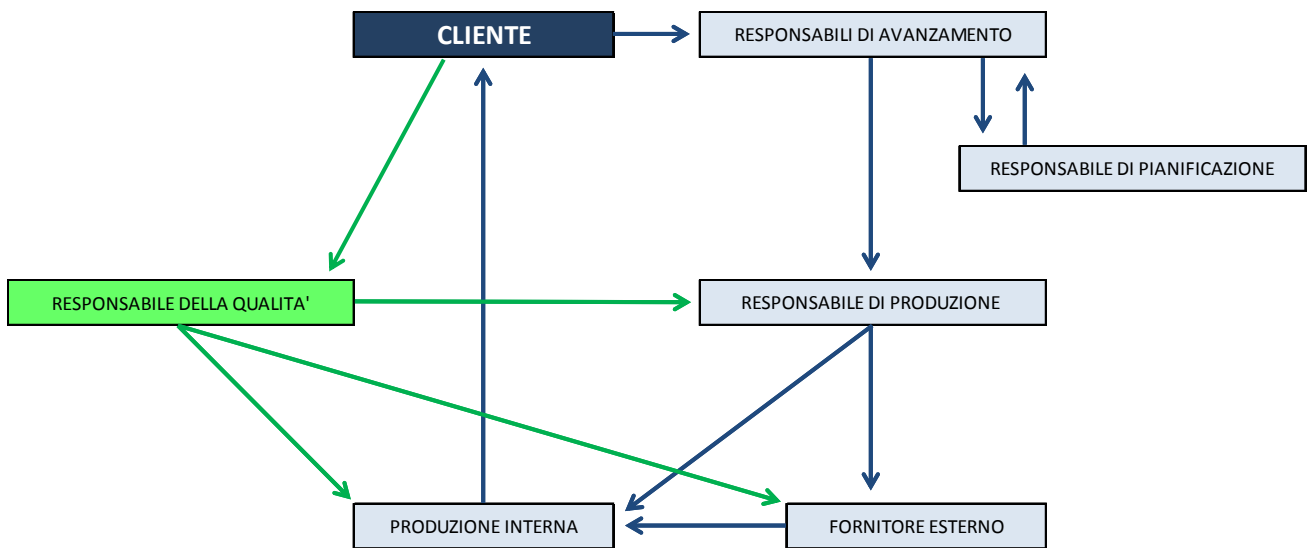
Figure 3

Figure 4 (red arrows) shows how the Quality Director, once the aesthetic assessment stages for the product have been completed, also effectively identifies the quality aspects of the process, monitoring levels of client satisfaction and providing this information to the Progress management.
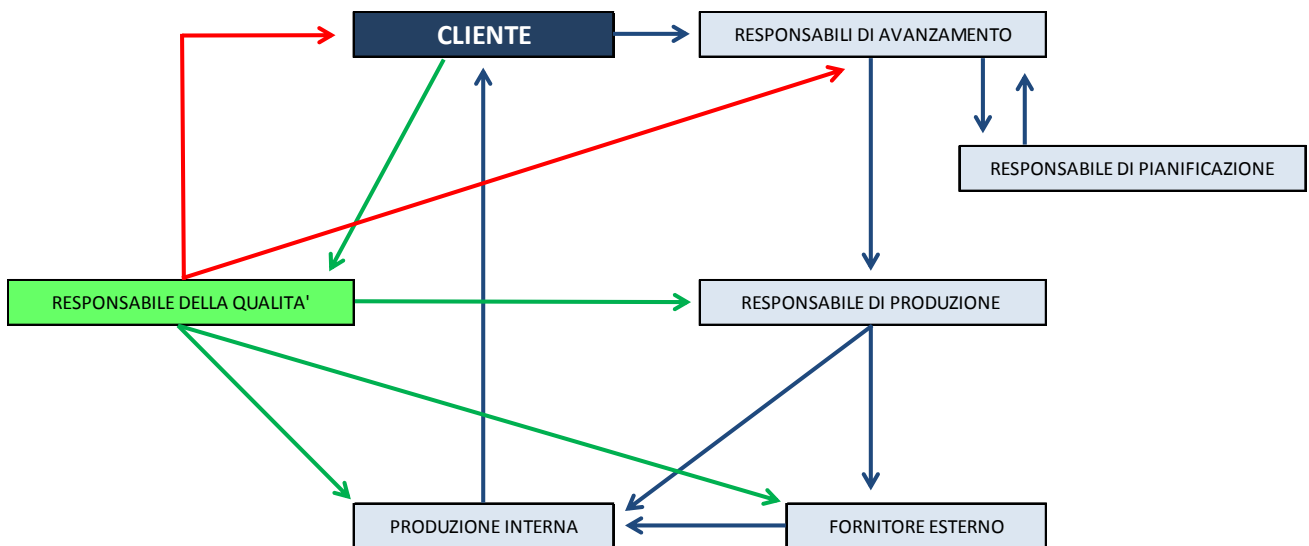

Figure 4

It is clear that the figure of Internal Quality Director covers a strategic, synergetic role that transmits the correct input to the whole organization concerning what the client actually wants.

For us, he has become a point of reference for offering clients the product with the necessary requirements.

The Progress Manager and the Planning Manager are the persons who bring into the company all of the requirements concerning management (binding requirements or instructions from outside the company) that the client requests together with the creation of the product.

See, for example, the application of methods for tracing metals which must be known and applied correctly by all staff, whether operating instructions that have been integrated into the system or external instructions, such as certified gold management according to the RJC Chain of Custody procedure.

MEASUREMENT, ANALYSIS AND IMPROVEMENT

At this point in the course, our company, as envisaged by the standards, constantly makes all of the recordings needed at all levels within the company to be able to analyse and monitor the data collected.

This action, which only commenced this year, will certainly provide important elements for the next business year, although the areas audited have already provided elements requiring focus for future improvements.

If, in the past, we learned from our company performance levels through a vendor rating from the client or a simple satisfaction report, we are now able to analyse data from our indicators internally, anticipating those from the client. This has allowed us to identify many pockets of inefficiency, and to implement corrective or preventive actions based on product or process non conformities as we have found them. With a view of sharing constructive information with the client, in many situations, careful management of company-client flows, as well as between company and supplier, has allowed us to isolate or anticipate any problems that would have impacted on the client.

CONCLUSIONS

In conclusion, implementing a quality management system has allowed us to begin a company reshuffle process that has been very useful in correcting processes that are not clear or inefficient procedures as well as to assess the potential risks and identify any opportunities (so-called ISO 9001:2015).

Therefore, within a brief period of time and also motivated by an external audit, we worked on making all of these new processes and necessary records introduced operational.

Although the company was already sensitive to some traceability logic for micro cast metals through to the finished product, the application of a quality manual has been a further guarantee of the good operation and use of control logic to satisfy the client.

The definition of a functional, well-defined organization has also laid the foundations for the company to transition from an artisan-based concern to a more industrial one, laying the foundations we feel necessary to sustainable growth.

Secondly, it meets with our need to integrate the ISO system with the procedures indicated for RICE certification within the two COC and COP outlines.

To sum up, we are now able to answer the following questions immediately at every level within the company:

•   What do I need to do?
•   What does the manual envisage in this case?
•   I apply the operational procedure or instruction
•   I analyse the indicators

and once they have been analyzed and a result has been managed following a logic known as Plan - Do - Check - Act (Deming Cycle), intervene in organization for continued improvements to same and increases in client satisfaction.

ACKNOWLEDGEMENTS

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