Standardisation, testing and certification together for a new combined success

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Abstract

Growing globalisation requires technical standardisation as well as common rules in order to assure to all stakeholders a fair competition and trade. Therefore developing internationally approved and harmonized standards is essential. However standards only set some criteria and often only define a minimum level of requirement while there is a growing need for a clear interpretation for a better evaluation of the results. In this frame a system where the development of harmonized standards together with a harmonized testing and certification system offers the best chance to evaluate products and to guarantee all stakeholders. Besides certification will offer an assurance service with a regulatory function importing and enforcing standards too.

1. Preface

Growing globalisation requires technical standardisation as a well as common rules in order to assure to all stakeholders a fair competition and trade. In this frame the development of internationally approved and harmonized standards is essential. It is also essential to develop internationally approved and harmonized testing and certification in order to guarantee the whole process to all stakeholders.

A fair market where all stakeholders have the same guarantee is in line with the definition that can be found in the World Trade Organisation (WTO) documents stating that the WTO "deals with the global rules of trade between nations. Its main function is to ensure that trade flows as smoothly, predictably and freely as possible".

In this work we will try to give an answer to the need of a smooth, predictably and freely trade through a system based on the harmonisation of standardisation, testing and certification.

We can imagine a global harmonisation with arbitrarily set regulations that could be used as an excuse for protectionism. Therefore the WTO Agreement on TBT (*Technical Barriers to Trade*) tries to ensure that regulations, standards, testing and certification procedures do not create unnecessary obstacles, while also providing legitimate policy objectives such as the protection of human health and safety, or the environment.

In this frame a good practice is to avoid unnecessary obstacles to international trade by making regulations and conformity assessments procedures more transparent, open and predictable that will benefit companies and countries with limited resources trying to meet the requirements of their export markets. In the meantime they will assure for a fair competition.

The following chapters will define the meaning of standard, test and certification and then summarize the benefits of considering them as single parts of a sequence in a whole process offering benefits to all stakeholders.

It's a common thinking that harmonised standardisation alone may offer a guarantee on a product or a process but often there is the need for an assessment made by an independent third party body.

This assessment or certification has to follow well defined rules and has a double benefit: the first is to assure the company asking for it that it has fulfilled all the requirements and the second is related to the market that will recognize in the certification mark a guarantee that the product or process is made in respect of all requirements. Of course in this process large companies will be able to manage this assessment process by themselves but it is not enough because in a globalized world it will always be possible that a declaration of standards fulfilment is not perfect and the product will go on the market causing damages to all stakeholders. We have some good examples for that and with the increase of the number of global players there will be a higher risk that this may happen.

2. Standardisation

Standards are defined by ISO as a "*document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, processes and services are fit for their purpose*". Besides the CEN adds "*standards are created by bringing together all interested parties such as manufacturers, consumers and regulators of a particular material, product, process or service. All parties benefit from standardisation through increased product safety and quality as well as lower transaction costs and prices*".

These explanations offer a clear meaning of the importance of standards in every sector. A major example and driver of the development of global standards is the ISO that since the founding in 1946 has promulgated of thousands of standards (more than 19.000). In 1987 the ISO developed a significant new path when it adopted the ISO 9000 standards of quality management. Afterwards many firms all over the world have chosen to have their systems independently audited and certified. This situation made the ISO 9000 standards *de facto* the requirement for doing business in Europe as well as in other parts of the world. Other examples are the European CEN standards system that provides for standards generally harmonized with ISO standards and other national standards systems.

In this frame harmonized standards are unquestionably one of the most important prerequisite for driving efficiencies in the industry but also for other stakeholders.

The CEN is very clear in summarizing the benefits (a similar list is on the ISO web site):

- for enterprises (there is a distinction between small and large enterprises but benefits are almost the same): reduce business cost, open new export markets, improve products, attract new customers, inspire added trust in the business, make products comparable, help business to be more sustainable, improve the changes of success, disseminate and promote innovation, improve product safety etc.;
- for trade associations and federations: inspire added trust in the business, disseminate and promote innovation, improve products, comply with regulations, open the gate to global trade;
- for public sector: support and complement regulation, make lighter touch regulations possible, support public policy, interoperability and accessibility, improve success in public procurement, encourage research and innovation, simplify processes, build a better future for the economy, open the doors to new markets and trade, improve protection for all;
- for consumers: protect the safety and health of the citizen, inspire confidence, integrate sustainability, ensure accessibility.

All the above listed statements offer a clear idea of what standards are and the benefits they can provide. The processes of standardisation are open and the time to define and approve a new standard can differ depending on the agreement process it has to undergo.

Applying a standard to a product means that the product should be made according with the standard' requirements.

This is the first part of the process we are developing in this work.

3. Testing

Testing plays a key role in the process because it is based on a methodology that is the translation of the standard in a procedure stating how to apply and verify the standard's requirements on a product or process. A test is a procedure for critical evaluation or better a means of determining the presence, quality or truth of something. Usually a test procedure is included in a standard and we may take as an example the ISO 12003-2:2008 (*Agricultural and forestry tractors – Roll over protective structures on narrow track wheeled tractors – Part 2: Rear mounted ROPS*) where it is defined the clearance zone and acceptance conditions for rigid or tiltable, rear, two-post roll bar, frame and cab ROPS, and is applicable to tractors so equipped having specific characteristics.

Even in this case the standard does not include any information on the system in which the test should be performed. In other words even if some information may be provided on the implements to be used to make the measurements there is no info on the system to be used (self testing or third party testing).

So far there are many possibilities to perform the test that are left open. In this frame the test may be performed by the producer or by a third party body and only in the second case we may have a certification. This is a very important difference because we range from a self assessment to a third party assessment.

According to the above mentioned examples the test lies exactly in between the standard and the certification establishing a close link between both and plays a key role in the process.

We may consider also the testing as a harmonized part of the process. Besides if testing is performed on a different technical basis or in a different system (self testing or third party testing) the result will have a different meaning or may have a different output.

This is the second part of the process but is totally useless without a good standardisation work and an even good certification process offering clear regulations.

4. Certification

In the ISO web site the definition of certification is as follows: "*the provision by an independent body of written assurance (a certificate) that the product, service or system in question meets specific requirements*". Besides, the same web site states that it "*is not involved in the certification to any of the standards it develops. Certification is performed by external certification bodies …*". Besides it is useful to know that the ISO Committee on Conformity Assessment (CASCO) has produced a number of standards that relate to the certification processes.

The certification is therefore the final act of a process that states officially the positive results of the testing activity based on standards. Of course there are many certification bodies on the market and the evaluation should prefer those that have an official accreditation that is a confirmation of the competence. Accredited certification bodies can be found by accessing the list of the national accreditation body in every country.

Even the certification process has to comply a well established procedure stated in international standards and should be performed by an accredited certification body.

The accreditation process is the process assessing that the certification body is capable of carrying out certification. Accreditation is not compulsory but it adds another level of confidence as accredited means the certification body has been independently checked to make sure it operates according to international standards. In other words the whole process is under control.

This is the third part of the process assessing that everything contained in the standard has been checked with a positive result. Besides it assess that the results are all obtained on the same method and procedure making it possible to compare them. If we go back to the preface we can prove that it is perfectly in line with the statements contained in the preface.

5. The full process

As mentioned before harmonized standards facilitate cost effective and expedient conformity assessment for products, services and personnel. However, in most situations, users of the same standards can demand different conformity assessment activities as a demonstration that the requirements in the standard are properly fulfilled. The broader the use of the standard the greater the number of users and potentially the higher the variability in the types of conformity assessment activities demanded to accommodate national and marketplace differences.

In order to have a better understanding of the differences among the three key issues of this paper (standardisation, testing and certification) an experience carried out among the ENTAM (*European Network for Testing Agricultural Machines*) network some years ago may offer a good example.

The ENTAM is an Agreement signed by different testing stations in Europe in order to provide for a common testing activity and a mutual recognition of test reports and certifications. Members of ENTAM drafted a first common testing methodology based on existing international standards and decided to perform a so called round test in order to check together the results using crop protection machines. Two machines have been selected: a boom sprayer (manufacturer Hardi) and an orchard sprayer (manufacturer Unigreen). The two machines went in Member's testing stations that performed all the tests provided in the common methodology. Subsequently a special session of the technical ENTAM Meeting was held in Montpellier (France) and results were discussed in order to check the differences. During this meeting results showed significant differences even with a full

standard's harmonisation and a full testing methodology harmonisation. After much discussion it become clear that most significant differences were caused by a different interpretation of the methodology. Being clear that most of the tests have been performed according to the ENTAM methodology and were laboratory tests therefore the environmental conditions didn't affect the results. After much discussion it became clear that the reason was a different interpretation of the methodology. Therefore the common methodology needed to clearly explain the test conditions and procedure in order to have a similar output in results not depending on the laboratory.

Besides laboratories had to be accredited according to the same rules.

This example is very clear in stating that standards are not always enough to provide a unique system performing the same results on products or even on processes. Therefore only a system with a well established standardisation activity as ISO or CEN and other international organisations together with a well established testing and certification activity providing for the interpretation of standards can have as a result a high level system of quality and conformity assurance.

The value of the system can b increased if everything is performed under the umbrella of an intergovernmental organisation as the OECD Tractor Codes are.

Of course, in this frame harmonisation plays a very important role because if the standards are different it will be impossible to have a common testing and certification.

Some help may come from some international agreements as we see in Europe where many efforts are being made in order to facilitate intra-European trade by harmonizing regulatory requirements. Even the WTO (*World Trade Organisations*) provided that where international standards for technical requirements exist, Member states should use those standards as the basis for their own technical requirements.

But in both cases referring only to the standard may not be enough because it may take to the situation mentioned above related to the initial Entam activities. Only a full harmonized process of standardisation, testing and certification can assure all involved parties as well as Governments and all stakeholders. Besides it assures for a fair competition among companies too.

In this frame a number of factors are coming together in the global business environment to cause the demand for standards and third party assurance services to explode. The role of standardisation and certification is rapidly becoming so important that even in parts of the world where the rule of regulations is weak it may be a good mechanism to regulate business. The reason for this success is quite clear for buyers and for suppliers. Buyer firms not always have the appropriate expertise and incentive to inspect products to be sure they meet specifications. On the other side suppliers might have the necessary expertise unlikely to have the necessary independence to inspect and certify their own factories. When companies are located in different world areas and economic systems the assurance system based on common standards, testing and certification can provide for trust among all involved parties in every step of the process.

In this frame we have to distinguish a standard compliance based on a self declaration from a standard compliance based on a on an official test and certification. An example of self declaration is the Machine Directive that provides for the *CE* declaration made by the manufacturer. This declaration is simply a self declaration and the process stops with the hypothesis of fulfilment of standard's requirement without any external third party assessment. In other words the value of it is limited to the skills inside the producer. At the same time for the most dangerous machines the Annex IV of the above mentioned Directive provides for a testing and certification. The fact that for dangerous machines or components the self declaration is not enough is a clear demonstration that an assessment (standard fulfilment + testing + certification) is necessary to provide a full guarantee.

A clear example may be offered by the agricultural and forestry tractor sector where different standardisation systems are active. Even here harmonisation is very appreciated by all stakeholders because it makes everything much easier for the already stated reasons. Different systems may provide for more cost and less efficiency to all stakeholders including Governments that are responsible for the homologation process. But the fulfilment of standard's requirements is not sufficient because of the many reasons already explained (different interpretation, different approaches to the compliance process etc.) and this becomes more important dealing with key safety aspects as for example the protective structure for the operator. In these cases the process should be completed with a testing and certification system offering to all manufacturers a fair competition ground and provide users of safe machines. Of course the process should not be a monopoly of one testing station but it should be open and in this case the OECD (*Organisation for Economic Co-operation and* Development) is providing for a well established system where all participating countries may provide inputs. The system is based on common methodologies defined as Codes that are used by accredited testing stations to perform tests on agricultural and forestry tractors. There are many accredited testing stations in different countries operating on the basis of a free market. In addition there is an OECD governed centre providing for the issue of certifications based on tests performed by the testing stations.

The OECD tractor Codes concern the performance tests providing that all tested tractors must complete compulsory tests of engine power output and fuel consumption, drawbar power output and fuel consumption, hydraulic lift capacity. In addition there are measurements of the noise level at the operator's driving position and safety tests dealing with the Roll-Over Protective Structures (ROPS) and Falling Object Protective Structures (FOPS). Special Meetings and the possibility for every Member country to give inputs is assuring the system a high level of transparency and competence.

Of course the process has to work as smooth as possible in order to not become an obstacle in terms of time scheduling, cost etc. as it does at present time.

During the last years in the OECD Annual Meeting that is the formal meeting where problems are discussed as well as all other issues that need a vote to be introduced in the OECD tractor Codes the harmonisation process had a key role. More in detail there has been a discussion on the roles of the different standardisation organisations and at the end a complete harmonisation concerning standards content was achieved with full agreement of all Member countries. At the same time it has been stated that if other organisations have the role to produce harmonised standards the OECD has the role to develop and include harmonised standards into the Codes and then into the testing/certification process assuring an added value to all stakeholders. This is an important difference between a standardisation organisation and an organisation providing also for a testing and certification process even in the case the standard contains information on test procedures. The whole process is completed only by a testing and certification system that is not provided by the standard.

Of course everything should always be made in a frame of standards harmonisation as mentioned before and the value becomes much higher if the process is carried under the umbrella of an international inter governmental organisation.

This is a clear example of a complete system providing for the same competition floor to all manufacturers and offering Governments a clear and fair system. The system will automatically exclude unfair competitors leaving the floor only to fair manufacturers.

This is in line with the all the international agreements in trade and in line with the Governments agreement to promote the fair policies improving the economic and social well being of people around the world.

Therefore a complete standard harmonisation among all involved institutions, public and/or private, giving clear information to all stakeholders should operate in synergy with a testing and certification system.

6. Benefits

In this final part of the work we will see the benefits of the whole process in a globalised world where production is made in different countries and much discussion arise when there are state subsidies involved either to the industry as well as to consumers.

In this work we've described how standardisation of products and processes in conjunction with testing and certification provides an important solution to the puzzle otherwise posed by moving production out of firms and into hybrids, networks and global supply chains that may be considered as "rule less" environments.

Standardisation, testing and certification reduce a number of risk and cost and can promote co-operations. Certifiable standards together with certification reduce significantly the transaction cost of ensuring quality of products produced even outside the company.

Finally it is possible to state that standardisation, testing and certification are an enduring feature of the global business environment and may provide for clear and immediate benefits to all stakeholders.

In the case of agricultural machinery where the use of different technologies as well as different products coming from different areas of the world have to fulfil standards requirements only this full process can assure all stakeholders and even Governments. When Governments have a subsidy policy it should be oriented only to products with a clear assessment of quality and standards compliance. This can be made only through a well established standardisation, testing and certification process. Besides, if this process is made under the umbrella of an international and intergovernmental organisation as OECD does for the Tractor Codes it is the best guarantee for all stakeholders that a fair competition is under process.

In conclusion one standard, one test and one certification accepted everywhere should be the perfect situation for a fair global trade of quality products.

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