

Examples of practical use of ISO/IEC 25000

Domenico Natale, Andrea Trenta
 UNINFO UNI CT 504
 Technical Committee System and Software Engineering
 Italy
dnatale51@gmail.com
andrea.trenta@dataqualitylab.it

Abstract— In recent years the ISO/IEC 25000 series of standards seems to have reached their completeness and maturity expanding their definition from software to systems, data and IT service products. The ISO/IEC 25000 application in industry is on a voluntary basis, but it is also supported by public regulatory context. Some actions are also undertaken to apply these standards when new quality measures are defined.

Keywords: data quality, software quality, product quality, new technologies, new measures, statement.

I. INTRODUCTION

This paper concerns a description of ISO/IEC 25000 series adoption in Italy and an approach to allow application of the series when customization measures are needed. It is not an article concerning research work, but a brief experiential story of regulatory laws and lessons learned.

II. STATE OF ART OF ISO/IEC 25000 IN ITALY

The application of the ISO/IEC 25000 series was primarily reflected in the companies where the attending experts had participated in ISO/IEC JTC1/SC7 Working Group 6 activities.

Some examples of the first applications come from companies with very large data bases, specially to guarantee consistency between systems; the other applications come from enterprises that can benefit of a preventive and well-defined application of software product quality control, specially to guarantee usability for the final user.

Another experienced context is the public procurement of IT products, where the tender entity requires or recommends the application of ISO/IEC 25000 series; this followed the endorsement on behalf of the Italian IT regulation authority of ISO/IEC 25010 and ISO/IEC 25012 as a quality reference.

The following documents have been published by public authorities (www.agid.gov.it - www.uni.com):

-Technical guide to the use of metrics for application software developed on behalf of public administrations, concerning ISO/IEC 25010 and ISO/IEC 25023 (by AgID the Italian Agency for public administration);

- Technical rules to identify critical data base and to define the updating methods to guarantee their data quality, recommending ISO/IEC 25012 (by AgID);
- Three-year plan for Public Administration suggesting the use of ISO/IEC 25012 (by AgID);

- UNI/TS 11725 Guidelines for measuring data quality, concerning the application of ISO/IEC 25024 (by UNI - Italian National Body);
- “Statements” of ISO/IEC 25000 compliance have been recently issued by accredited companies that act as a “third party” for the companies that wished to be certified.

III. LESSONS LEARNED

The experience developed in Italy in the introduction of ISO/IEC 25000 has gone through several steps, for example:

- the acceptance of the theoretical models took place when the quality measures were published and adopted;
- companies have started to form their own staff;
- the staff understood that the measures are not related to their work, but to the products;
- the client has understood that under observation there is not only the quality realization of the software, but also the goodness of the requirements;
- the government asked for the races increased quality of the product to contrast lowering cost in some published tenders;
- companies have understood that ISO/IEC 25000 series cannot be applied to the entire information system, but gradually to the products of the company's core business;
- companies have realized that for new technologies, there is no need to reinvent the wheel, but combine the defined quality characteristics and eventually enrich them with new features or measures.

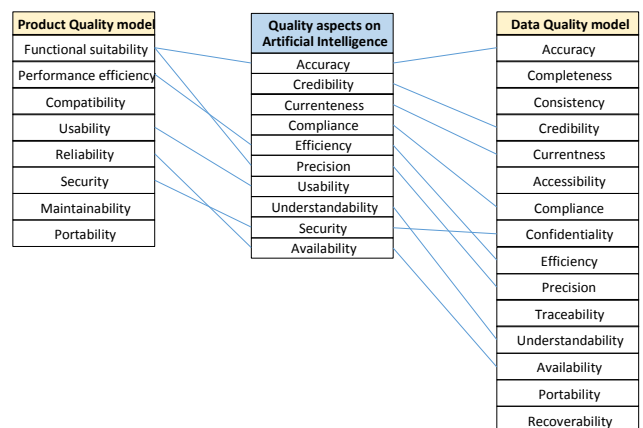


Figure 1 Example of relationship between quality aspects on AI and quality characteristics of ISO/IEC 25010 - ISO/IEC 25012

IV. CONFORMING MEASURES

The ISO/IEC 25000 defines 36 quality characteristics and over 200 quality measures and expected further multiplication of characteristics in the future, particularly of measures.

In the contexts above, to ensure the maximum effectiveness, a detailed description of the measures adopted/required/suggested is envisaged.

This comes from the fact that measures are generally defined or suitable for contexts that are not the same of the desired one. It should be noted that ISO/IEC 25022, ISO/IEC 25023, ISO/IEC 25024 clearly foresee the possibility, at certain conditions, to define new measures (conforming measures) if required by the user or by the context. Following this approach there is no need to draft a new standard for each new technology (Big Data, AI, etc..), as it is up to the user to do so.

For example: the ISO/IEC 25024 Acc-I-1 standard measure was intentionally defined in a generic way, as the score from strings comparison depends on the algorithm chosen. The solution proposed in Italian working group of UNINFO/UNI (Italian NB) is to register the new conforming measure Acc-I-1-IT-1¹. The new measure specifies the Jaro-Winkler as the comparison algorithm to be used, and so it is applicable; the user who needs a different algorithm, can design a new conforming measure.

V. THE PROPOSAL

But there arises a problem: how to distinguish a standard ISO/IEC 25000 measure from a user-created one? Who is in charge of checking and documenting the new measure against ISO/IEC 25000 criteria? And secondly: how to share a “user-created” measure to ensure comparison? How to avoid duplication of similar user-created measures?

The mentioned national standard UNI/TS 11725 created a first version of measures that incorporates some user-created measures for data quality; then the new user created measures are:

- public (easy to be accessed);
- experts checked (against ISO/IEC 25000 rules);
- registered (non-duplicated).

Moreover, when a National Body could be in charge of this type of registration process, it should be assumed that the user-defined measures have the same intellectual property and the same legal value of the standard ones.

Figure 2 shows a possible approach that can fulfill every need of measurements exploiting the conforming measure mechanism defined in §2 of ISO/IEC 2502n (n=2,3,4).

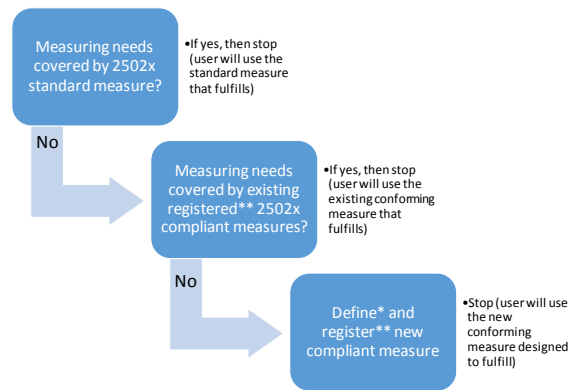


Figure 2 Flow of selecting quality measures or defining and registering new ones

Some issues are to be investigated in particular about the registration of measures:

- the registration process within and outside national borders, interaction among National Bodies;
- publishing and accessing user-defined measures;
- feedback to ISO editors of quality models

VI. CONCLUSION

This approach can appropriately address some issues recently investigated by the Future Directions Study Group of ISO/IEC JTC1/SC7/WG6; in particular, the approach depicted above is applicable for example to AI and other themes. In those areas the algorithms - whose time efficiency is a crucial measure - are evolving very rapidly and there is the risk of reflecting them too late in a new standard. The registering approach for user-defined new measures, allows immediate application. Nevertheless, this doesn't preclude the evolution of standards, also making it easier, as the new measures will come mostly from experienced applications and not only by theoretical reasonings.

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¹ Naming is supported by ISO/IEC 25020:2019