Abstract

The Industry which has and continues to evolve is now facing new challenges and reorganizations in terms of markets, technologies and human resources. These developments directly affect NDT fields and the ways in which Certification Bodies must ensure Security, Reliability and Reactivity throughout the certification system.

In an effort to preserve and improve these three aspects of the certification system, it is necessary to assure the technical competence of certified persons which will correlate directly to improved quality and safety of materials and structure. Additionally, certification systems will become paperless so records can be maintained online to ensure retrievability, stored in a manner that prevents damage or deterioration, and remain accessible at any time from anywhere.

The utilization of an online certification system produces many positive results, such as: constant and instant access to any information about certified persons; the homogenization of certification system management at a national level which contributes to better personal training; higher levels of security and accessibility for all records and data, including the ability to electronically archive and file information; and finally, a significant reduction in the duration of the certification process. This presentation is mostly based upon the French certification system IT but include those from other European nations.

While the efficiency of this new system has already produced significant improvements, further progress can be made at the national level, without overlooking the eventual possibility of the implementation of a homogenized, European IT certification system.

Keywords: IT, Security, Reliability, French certification body
1. Introduction

An Information Technology (IT) can be described as an organized set of resources (hardware, software, personnel, data, procedures, etc.) that can acquire, process, classify, store, and disseminate information in any format (data, text, images, sounds, etc.) within and between departments of an organization. It thus includes organizational, human and technological dimensions in the development of information management within the organization in which it is deployed.

As a real support of information and especially its memorization, it is a great force for change and improvement of an organization both functionally and structurally. In the field of Non Destructive Testing (NDT) and more specifically within the certification of a national organization such as Cofrend, it is the central tool that manages all functions of the certification process on a daily basis.

To illustrate the extent to which an IT can improve the management of a certification system within an organization, an example is taken from the particular case of the French Confederation for Non Destructive Testing (COFREND). First, an examination of the structure of the organization and more specifically its certification branch and associated IT is conducted. Subsequently, the principal aspects of the IT are detailed with various examples to highlight the positive outcomes following the introduction of this system. To conclude, some evolutions are proposed as possible examples of the optimization or improvement of the certification management in the field of NDT.

2. The Cofrend, the certification system and an IT

The Cofrend is structured into three major branches: Expertise, Event and Certification. The latter, headed by an Executive Certification Committee, is led today by the Direction of Cofrend and the five Sectorial Committees which include: Aerospace, Manufacturing and Maintenance, Foundry, Railway Maintenance and Steel products. To manage all activities related to the certification system, the Sectorial Committees are supported by a network of 38 approved examination centers in France and one in northern Africa, specifically in Algeria. Therefore, over 100 people, are affiliated with the various aspects of certification within the Cofrend.

The particularity of this structure lies in the fact that the examination centers are housed in local companies that are independent of Cofrend. For this reason, the personnel are not associated full time with the operations of the Confederation whether related to certification or to other branches.
Additionally, the various Sectorial Committees have a certain amount of autonomy in their management of the certification process, which allows for the existence of heterogeneities that complicates control within the Cofrend without jeopardizing the quality of certification issued.

With the intention of standardizing and optimizing the system, in late 2006 the Cofrend established an information system called GERICCO (Gestion par Réseau Internet de la Certification Cofrend) for the Management by Internet Network of the Cofrend Certification, accessible online at the following address: www.gericco-cofrend.com. Integrating all the key stages of the certification process, from the registration of a candidate’s file to the issuance of the certificate (in the shape of a credit card) as well as the management of examinations, the IT also includes the dematerialization of various other information annexes. We can thus find a large number of elements relate to the certification process and its quality, including the procedures, assessments and non-compliances or the medias of correspondence and communication.

Access to the IT and the knowledge of its various uses is reserved for those initiated into the certification system and for its purposes, rendering it therefore necessary to control and manage the realm of their operations but moreover their knowledge of and competence with the system.

3. Access and Security

Despite all the benefits of the dematerialization (i.e. paperless and online) of the IT, it remains necessary to control access to and manage the security of the system. In fact, the availability, integrity and confidentiality of information as well as the non-repudiation of records and the traceability of operations are all important factors in ensuring optimal security of the IT.

![Gericco access interface (login/password)](image)
Firstly, as the processed data in the certification system is for the most part sensitive or confidential information (test results, professional and personal information, etc.) the consultation and modification of information must be controlled according to the access rights of the IT users. These users are uniquely identified via a login/password and several access profiles for various functions (e.g., issuance of certification).

Subsequently, the online publication of information must be carefully controlled as beyond the "external" threats (e.g. system hacking), simple risks related to the complexity and the nature of computers and network technology can corrupt, rendering useless or even destroying data related to the certification. Therefore, various backup devices are in place to ensure constant availability and security. Moreover, despite the increasing reliability of computer hardware, the possibility of the corruption of data, whether intentional or accidental, cannot be excluded. For this reason, it is important to verify the integrity of the data and to make voluntary corruption impossible through tracing operations.

Finally, as the steps of the certification process and associated documents are immaterial, it is important to provide guarantees of non-repudiation. This means that it is impossible for a person active in the IT to deny any action taken therein. To this end, all users must be authenticated and identified throughout the process, as it would be in the same paper process. It is also necessary to record and archive the data provided in the IT at the time of entry so that all recorded content is available in the case of an assessment.

4. Acquisition

The main functions of an IT, in terms of data acquisition, are to assist and automate human labor but also to supply information. As in any process, some steps and actions are repetitive and some can have a low ratio between their completion time and their value added.

Dematerializing the certification process and implementing an IT can therefore simplify and automate certain tasks and thus ensure that the acquisition quality is optimum and continuous. For example, the use of standardized input fields for dates or drop-down lists for selection of criteria homogenize data entry while making it more reliable. The number of errors related to acquisitions and repetitive hand-written data is reduced.

In addition, this eliminates any multiple entries between different departments because the database is common to all users. The information recorded therein is therefore unique and shared among users according to access profiles. For example, when registering a new candidate for
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certification, required fields and filters will be automatically verified to ensure that all necessary information is completed and not contradictory.

Figure 2. Certification selection (standardized input fields and drop down lists)

5. Processing, classification and storage

As with the acquisition of data in the certification process (described in the preceding paragraph), information processing consists of steps and repetitive actions that are sometimes time-consuming and associated with a low value added. The implementation of an IT can therefore automate and simplify certain tasks, thus ensuring the optimal and constant quality of data treatment.

Indeed, the use of a work tool that is uniform and common for all users facilitates initial or day to day training by describing to users how to acquire and process information at all stages of the certification system. In addition, some operations such as filters or systems of decision support are in place as intelligence automatic sanction under consideration (received, deferred or eliminated) by results of a candidate.

Automated processing of an IT and its database greatly simplifies the qualitative analysis of the certification system through various statistics. To control and analyze the process of certification, the Cofrend use a large number of statistical elements such as the number of certificates (including
their detail) delivered over a period of time or the rate of success and failure of an examination in a particular department of the organization.

To globalize, classify and store data in a standard and consistent manner but also to dematerialize it in one location online allows certification system users to have access it from anywhere at any time. It is important to note that the database in an organization and its various departments is comprised of the individual users’ abilities but also those formed collectively by the organization around its IT.

First, it greatly reduces the time required to access the information. To see a candidate’s examination results, the results of an audit or the latest version of a procedure, a few clicks suffice. In addition, the standardization of the access to archives mitigates differences in knowledge, due to the seniority of individuals within the organization, as well as differences between the various operating departments.

Secondly, there is a reduction in the space needed for storage volumes and its associated costs. Whereas, formerly, paper records of certification could fill an entire shelf, these same files occupy only a few bytes of space in the IT database. In addition, the costs of printing, copying, and archiving paper documents are well above those associated with dematerialization besides scalability (expansion of the quantity of information). It also has a significant impact on data management flexibility in the IT.

![Figure 3. Examination files interface](image-url)
6. Diffusion

Although the main features of IT are, as defined above, to acquire, process, classify and store information on the certification system, there is a fifth feature that is equally as important: the distribution of this information. Indeed, to execute his or her tasks in the certification process, it is important that an IT user can obtain and also disseminate information in an understandable manner both easily and quickly.

First, the possibility for a user to view directly any information (test results, end date of validity of an agent, etc.) regardless of time or place is a major advantage of using an IT online.

Secondly, the dematerialization allows for direct recording from large volumes of information in the associated database and for exchange in real time between users in departments that may be geographically far apart.

In addition, the various communication documents, consisting of information previously acquired, processed and used throughout the certification process, are created directly from the IT before being distributed to recipients. This can include letters of convocation of candidates and juries to the tests, for example, or even the sending of the agent’s certification card.

It is also easier for an organization such as Cofrend to disseminate information regarding NDT certification agents to the companies concerned through an IT. An interface for a list of certified persons and details of each certification is freely and easily accessible online.

![Certified persons list interface](image)

Figure 4. Certified persons list interface
7. Conclusion

As a real support of an organization information, an IT is a great force for change, optimization and improvement of the certification system such as that of the Cofrend. It is important to highlight that despite the apparent simplicity and efficiency of acquisition, processing and dissemination of data internally or externally, security should not be neglected.

Given the constant evolution of computers and related materials, it is difficult today to imagine what the IT of tomorrow will look like and what format the certification issued will take. However, it is certain that dematerialization will continue to progress in the field of NDT as evidenced by current thought and new establishments like an online electronic certificate.

Although the benefits of implementing an IT are evident nationally, it is more complicated to obtain the same result at the European level as the diversity between certification bodies is high. It is nevertheless interesting to ask whether the utilization of an European IT to manage certification would be conducive to better recognition and equivalency of certificates issued. At the same time, would it not be an especially appropriate response to current market dynamics in the realm of NDT and the companies who employ certified agents?