

# Long-term preservation and certification: civil status in a digital environment

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## Abstract

*This contribution describes a job that took inspiration from the innovations introduced by decree of president of the republic 3 November 2000, n. 396, concerning the civil status review and simplification, identifying main objective is to provide guidance on the method for digitization of the civil status records by the decree required that through the development of guidelines, rules and technical and organizational standard shared. The work represents the fruit of a great collective effort, involving researchers with deep knowledge in the computer science and archival field, people with enthusiasm and intelligence they were compared on the search for a common language to be used to understand what were the problems of record keeping. The debate around these issues has allowed us to better understand what were the difficulties of a science, especially with regard to the retention, in a digital archive, the archivistic link, a concept that has a very strong echo in the archival thematic dealing with the problem of document management. The collaboration between the archival and information technology has been intended to study and develop a model of interdisciplinary cooperation that led to the establishment of a research area that could be called "digital archival science" in which to analyze cultural and technological models for the documents conservation and information processing in a digital environment. Here are the three stages of research:*

- *analysis of the scenario and the existing regulatory framework;*
- *weakness analysis of the main system;*
- *proposals for overcoming the weaknesses and develop a new model for automated workflows and records management of civil status in Italy - to draw some consideration and analysis, in particular, on aspects of the proposed model can be "exported" with successful case study considered - the system of civil status in Italy - and to other possible applications.*

## Scenario analysis and the existing regulatory framework reference

There is no doubt that the civil status records are a cultural object, because the historical archives of Italian municipalities, retain acts of civil status from the nineteenth century and, in some cases, acts even more ancient, like parish registers usually taken as the basis for the civil status creation. It is also known that one of the canons of the Council of Trent (1545-1563), forced the priests to keep records of the acts of birth, marriage, death, of baptism and confirmation of its parishioners - the *quinque libri* - as con-

trol and support in the care of souls: now those records, usually kept at the parish or curie bishops from the sec. XVI, constitute, together with acts of civil status, a great source of research, not only for demographers and historians, but for anyone who wants to reconstruct the personal and family stories.

After these considerations, the archive transfer to digital can not overlook a reflection on the architecture of the system, on the form of documents, on the pattern, because it needs to ensure, the respect of a tradition that has so far allowed to retain permanent archives, and the system of relationships and information context that makes a set of an archive documents. A goal, in other words, to make the archives the mirror of renewal, the instrument of renewal of the Government and of the relationship between this and the citizen.

Recently the enormous development and diffusion of new technologies, including the legal relationships among private individuals, and the encouraging process of digitization of the administration, have led to extensive critical reading of the legislation. Without examining the evolution of the rules on documentary information systems and conservation in the medium and long term, there is only a brief description of the main legal measures in Italy. In decree of president of the republic 28 December 2000, n.445, and decree of Decree by the Council of Ministers 31 October 2000 are collected and systematized the provisions of the nineties related to creating, management and subsequent retention of the acts and administrative documents on paper. In particular, they recall the obligation of public authorities to equip himself for the proper setting of the document management system: tools such as holders or plans for grading, the library of records, plans of selection (or conservation plans) and the manual management. Also it defines certain obligations to fulfill and indicates the components of conservation.

In legislative decree 22 January 2004, n.42, the theme of protection and conservation of the documentation produced by the Government, the current reference standard, the "Code on Cultural Heritage and Landscape", states the principle that archives and documents of individual governments, regional or local authorities as well as any other entity and public institution, are cultural goods from the moment of their formation.

In deliberation Cnipa 19 February 2004, n.11 the object is the preservation of Government digital records and private individuals, in particular with the aim of making the document non-perishable, complete, accessible and available in the medium term. In fact the measures are essentially aimed at defining the rules for playing substitute. The decision has a substantial simplification of the processes previously regulated, especially in the

case of documents created with tools, and introduces the concept of the conservation responsibility, which is entrusted with the task of manage the whole process of breeding replacement.

The Legislative decree 7 March 2005, n.82, the “code of digital administration reorders” the main rules to place the document management in data-mode, making it mandatory to innovation in public administration; it offers to citizens and businesses the right to interact with it through technologies. Binds also the government to reorganize its back office, re-structures and operational procedures, and make available digital information.

In particular provides for the citizens and businesses the right to access and the sending of digital documents (Article 4), the right to receive any public communication by certified mail (article 6) and the right to find in network modules and forms valid and current (art.57). These rights require the production of documents, the complete management of administrative data processing and transmission of documents (artt.40 et seq.), with full legal validity in the relationships among citizens, businesses and public administration. Overall, the rules described converge towards the goal of establishing, through a complete document management with tools, organic archives in a digital environment, in order to make them available immediately and it provides the basis for their preservation in long term. They are also rules that should be taken into account in the definition of a documentary information system capable of providing maintenance over time of digital authentication, integrity, readable and searchable. This implies that the integrity and identification of some unique and individual documents and the relationships among them should be guaranteed, preserving the data to reflect the membership of each document to the archival complex (bottom series, file) where it is organically and hierarchically entered.

It should also be noted that in all cases the replacement of paper with his picture is only one electronic component of the total savings to be evaluated through a careful analysis of costs and benefits. The quantification of savings and economic benefits of implementing projects of this type is essential for their evaluation, including the main benefits usually attributed to the use of the tools of Information and Communications Technology, such as the recovery of productive efficiency, the speed in the development and transmission of information, the possibility of archiving and retrieval of large amounts of data.

A new process design will bring the creation of documents that are born digital, and it extends its benefits to all the subsequent steps of transmitting, managing and archiving of the document, eliminating the problems at the source for the certification of compliance and elimination of the original paper. The issue of digital documents management is crucial.

### **Analysis of the main weaknesses of the system**

One of the most problematic aspects of the preservation of digital documents is that the digital documents, just as they are no longer linked to original support and necessarily subject, for reasons of obsolescence of technology, to repeated migration, not contain any of the traditional elements and attributes that normally, check in long term the documentary authenticity.

Therefore who takes responsibility for the preservation has the role to identify, document and maintain those requirements and conditions; when they acquire the material, and in subsequent

speeches, the have to pay particular attention to the phase in which the property is made available to external users. The preservation in the digital environment requires that is properly documented not only about “unbroken chain” of custody, but also about any steps that have allowed over time the maintenance of accessibility and protection of the source.

The verification of the authenticity by the future researchers can only rely on the formation of pre-existenced conditions and procedures adequately documented to ensure the authenticity of the documents, also through the reliability documentary system. The presumption of authenticity in a digital environment and the possibility of verification, in particular, require that the documents are identified with certainty, and unequivocally, and that not only the information management of the document (such as data recording and classification), but also items such documentaries, are kept intact.

The issue of metadata categorization for preservation, has aroused and arouses considerable debate and numerous attempts at solution. The different types of metadata developed as a standard by the various professional communities are considered inadequate; on the other hand the practical and daily application is quite challenging: as a result, we have multiplied the attempts to produce standard set of metadata to different functional areas and under different types of resources handled, which have not given adequate results. Often this proliferation activities are not followed by significant experimentation and it has feeded the long series of schemes and proposals that have ended up disoriented, the professional communities without achieving the main objective is to respond to uniform criteria from the perspective of the IT system. From the analysis conducted by the Study Group on the processes, rules and, more generally, on the purposes of civil status, comes the consideration that the full automation of the civil status registers, it is still premature because it isn’t able to ensure all the preservation and authenticity requirements. In the course of the study we examined the civil status processes, their operational management, the maintenance and preservation of records and activities of certification: the main aspect is the ability to produce and maintain long-term digital documents with acceptable costs and to retain the characteristics of the original products reliability, authenticity, accessibility, quite similar and comparable with the traditional paperwork.

In addition, we have some very important issues, such as the management system called “hybrid”, where documents on paper and on digital media coexists within the same folders; such as the need to investigate the issue of electronic documentation conservation in the long term to define solutions and rules; such as the overcoming the cultural and psychological resistance against the use of digital documents; such as the staff training, especially in public administration.

This analysis has revealed the need to simplify:

- the citizens demand, of certificates and extracts of civil status;
- the circulation of information regarding the events of civil status in order to ensure the timely and consistent updating of both the civil status registers held by other municipalities, and the records Registry (facilitating communications among the offices of civil status of different municipalities and among the offices of civil status and register offices);

- the prefectures activity, with the action of supervision and with the keeping of second original records;
- the supervisory role on the documentation, particularly the long term one.

### **Proposals for overcoming the weaknesses and develop a new model for automated management of flows, and the records of civil status in Italy**

To meet the different needs, also taking into account the above consideration, the study group considered useful to propose a gradual process of automation that involves, at least for a first phase, the co-existence of paper files with digital archives. This process involves:

1. automation through the basic functions of the system of interchange for the civil status of communications among:
  - (a) offices of civil status and National Center for collection of CNSD in the Ministry of Interior;
  - (b) offices of civil status and register offices;
  - (c) offices of civil status of different municipalities and consulates.
2. automation, through the functions of digital archives and national digital storage management;
3. automation, through the management functions of the state civil services, management of the issuance of certificates from the digital archives;
4. subsequent automation, through the extended functions of the system of interchange of status, communication with several external bodies, identified by the process (the courts, hospitals, capitanerie port, religious authorities, etc.);
5. developing a support system to the functions of oversight and supervision of the prefectures and of the archives.

The proposal is therefore based on the coexistence, at least for an initial period that may be more or less long, the paper files with digital archives, where:

1. the traditional archive, held at the municipality, is the original that ensures the authenticity requirements and the legal validity and ensures the long-term conservation;
2. the document in digital form is produced at the same time when the municipality reports it in the traditional paper and sent to National Center for collection; the digital document archive is used for management and operational communications and the civil status certification;
3. the digital archive of each municipality is created at the National Center of collection with the digital documents received; it constitutes the digital form of the traditional municipal paper and operates as the original;
4. the National Center for collection performs tasks relating to civil status, as provided by dpr 396/2000, in the event of a prolonged inability to access data stored in the municipal archives, including what is necessary to ensure the capabilities of disaster recovery - business continuity;
5. the National Center for the collection is the digital repository, created with the collection of all digital archives of each municipality and with the necessary procedures to manage, update and maintainance in the long term;

6. digital repository is accessible to municipalities and prefectures, each in respect of;
7. the National Center for the collection will give to the Administration, in the time limits, the digital archives that are no longer subject to modification.

This solution allows to respond to the diverse and complex range of needs identified for both the operation and for storage. It assumes as one of the biggest criticisms: the alignment between the paper and the digital archive. The possibility to solve this critical point can be a valuable aid in technology. The basic prerequisite for any solution of course is the confirmation of the specific responsibilities of civil status in the actual transcription and subsequent validation of all acts, records, or adjustments in both types of archives. This should be accompanied by a specific supervision on the proper work environment.

From a general point of view with regard to the long term is also known that in the handling of information in a digital archive is needed to generate keys for identifying the identification of the elements that constitute it. To ensure a proper management to guarantee a long term conservation you must provide, in addition to identifying individual key elements, including identifiers and descriptors of content and context (metadata).

Digital archives are essential in our contemporary society where a strong, fast and frequent interaction among different institutions and actors is increasing. These archives have to be structured in terms of XML constructs, standard that can be used both for the structuring of data variables, and to define ways of viewing and, more generally, for the use of a combined fixed text with variable data. XML is a metalanguage that allows you to define the structure of documents and data. XML by its nature allows two types of preliminary preparation: verifying that a document is well formed and its validity compared to a structure (grammar). The software involved in these processes are called parser and there are standard tools available on different platforms.

Even for aspects of presentation (which are considered important for conservation), you can use XSL (eXtensible Stylesheet Language), a language that allows you to manage the submission and processing of XML documents in a standard and flexible way.

We do not want to go into detail of the XML standard and its use but only to remark that, using the standard available on the basis of uniform guidelines, you can ensure the reproducibility, in different technological environments, of the presentation format of a document; it guarantees the preservation not only of information that constitute it but also of its representation extrinsic. Structuring through XSD schemas can be used as a guide and support for training and specific description of the digital archive, as well as the XSL allows to describe the structure and semantics of the presentation of the various documents described by the grammar defined by XML Schema.

At this point it appears simply to clarify the difference among the issues related to digital preservation, ensuring the authenticity of the document processed through a computerized system and the digital signature of a document. The digital signature is limited to "make manifest and verify the origin and integrity of a document information" (art. 1, paragraph 1, letter n) of decree of president of the republic 7 April 2003, n.137) and to certify the identity of the signatory of the document (unique identification of the signatory, Article 1, paragraph 1, letter dd) of decree of president of the

republic 137/2003).

On the other hand, to ensure the authenticity of the document, it requires that it is also attested to the data structure and software (described in the context) to create a document, because it provides the information contained in the document and it allows the presentation in a form known and recognizable. All the components that contribute to the formation of the document must be ensured to guarantee authenticity.

Regarding the technical solutions aimed at ensuring the preservation and authenticity is therefore necessary to introduce some new concepts such as brand of a digital document, usually understood as a brand generated from a digital signature of the document itself.

If this procedure is applied jointly and in an automated manner by the management system, with the document, and all the contexts that describe him, we can extend the concept of branded digital label system. If we apply that brand to each document of a digital archive at the time of its formation, it guarantees the authenticity and integrity over time, particularly in the filing that contains the digital archive to ensure preservation. In the case of dynamic documents, ie subject to subsequent developments, a new (and of course different) brand system is set up at the time of the change of state of the document. The archiving of all brands of systems related to a document provides the opportunity to reconstruct its evolution and to identify the latest update available. The use of standard XML ensures the independence of the technology environment where the item was created and the various contexts described. The technological environment, in which the item was created, is just one of the contexts that help to shape the brand of system.

Finally the document may or may not be digitally signed and therefore the digital signature to take a clear meaning of the original manuscript of the individual signing the document. Digital archives can then have documents that require the signature of the underwriters and the documents do not provide.

As mentioned above, the structure of paper records is the current (four records: birth, marriage, citizenship, and death, in addition to the annual index registers and decadal) the civil status officer in the traditional way the instrument, annotations and corrections printed in the Register. The digital archive is single but has a distribution logic based on the type of documents. The notes are subordinate to which they relate and shall form an integral part. The paper records are closed consistent with the appropriate procedure and bound at the end of the year, so the printing of documents for the current year may be carried out by traditional printers. The next printing of the notes should be done with tools to bring the same notes over the pages of records already bound. The annual index paper records compilation of documents recorded or transcribed in the year, provided by law, is a further element of security. It must be planned and produced a digital equivalent. Furthermore, as already mentioned, the idea of compiling the notes for and for the corrections made in a register index is on paper and in digital form allows you to check immediately that all the entries made on digital documents have also been reported in the paper. The annual index records in digital form for the acts recorded and transcribed are generated automatically, for each act bringing the brand to the corresponding system. Indeed, when the civil status officer shall affix his signature on the digital document is generated the same brand of recording system and appearing in the

register index annual digital. Everything is sent to the CNSD to be stored in the digital repository National Center.

The civil status digital signature guidance and signature of the system, therefore, assume a vital role to ensure the authenticity and integrity of each document. The complex formed from the civil status digital documentary, composed of records of documents, registers and indexes the files of the attached completed by the respective metadata. To ensure the essential characteristics of reliability and continuity and long-term preservation of digital certificates it is necessary that the Ministry of Interior is the Certificate Authorities.

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