Citation:

The Preservation of Vital e-Records in Universities

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Abstract

Factors such as continuous technological change, the implementation of information and communication technologies and the Internet, and the development of Electronic Administration, have led to radical changes in the creation of records. These changes have, in turn, created new digital records creation, maintenance and long-term preservation challenges for organizations that are related to concerns such as: a heavy dependence on technology, the rapid obsolescence of the technology, the multiplication of file formats, the facilitation of increased documents and records creation, digital records with poor organization and control due to lax and inconsistent controls over creation and maintenance, the use of fragile storage media for long-term preservation, etc. Based on the preliminary findings of a case study developed by the Univeristat Pompeu Fabra Archive in collaboration with the Universitat de Girona Archive, this paper addresses these concerns in relation to the preservation of vital e-records of Universities, focusing specifically on the following research questions: How we can identify and classify vital e-records? What are the characteristics of vital e-records? What are the best strategies for creating and maintaining vital e-records? How should we appraise vital e-records? How we can guarantee the authenticity (identity and integrity) and accessibility of vital e-records? Which are the best formats for visualization and preservation of vital e-records? How can we describe vital e-records? Which metadata are necessary? What type of system is needed to keep and protect vital e-records?

Introduction

Factors such as continuous technological change, the implementation of information and communication technologies and the Internet, and the development of Electronic Administration, have led to radical changes in the creation of records. These changes have, in turn, created new digital records creation, maintenance and long-term preservation challenges for organizations that are related to concerns such as: a heavy dependence on technology, the rapid obsolescence of the technology, the multiplication of file formats, the facilitation of increased documents and records creation, digital records with poor organization and control due to lax and inconsistent controls over creation and maintenance, the use of fragile storage media for long-term preservation, etc.

This paper addresses these concerns in relation to research being carried out by TEAM Catalonia of the InterPARES 3 Project on the preservation of vital e-records of Universities. The first section of the paper contextualizes the research by providing overviews of: (1) the Spanish and Catalan legislation and the international norms and standards deemed relevant to the issues at hand, (2) the development of e-administration in universities in Spain and Catalonia, with a particular emphasis on the drafting of the *White Paper on the University of Catalonia*, the goal of which is to reflect on general matters of university policy and, at the same time, develop a common roadmap for the Catalan public universities, and (3) vital records, vital records programs and the implementation of such programs.

The second section of the paper introduces, and provides some analysis of the preliminary findings of, a case study developed by the Univeristat Pompeu Fabra (UPF) Archive in collaboration with the Universitat de Girona Archive that focuses on the issues surrounding the management and long-term preservation of the vital e-records of universities.

Administration of Electronic University Records

Relevant legislation

To date, the following Spanish and Catalan legislation has been identified as being relevant to the creation, maintenance, use and preservation of electronic university records in Spain and Catalonia:

General and common administrative procedure

- Spanish Constitution, of 27th of December of 1978 (BOE no. 31, de 29.12.1978)
- Organic Law 6/2006, of 18th of July of 2006, on the Reform of Statute of Autonomy of Catalonia (BOE no. 172 – 20/07/2006).
- Law 30/1992, of 26th November of 1992, on Public Administrations and Common Administration Procedures (BOE no. 285, de 27.11.1992).
- Organic Law 6/2001, of 21st of December of 2001, of Universities (BOE no. 307 - 24/12/2001 p. 49400), modified by Organic Law 4/2007, of 21st of April of 2007 (BOE no. 89 - 13/4/2007 p. 16241).
- Law 1/2003, of 19th of February of 2003, Universities of Catalonia (DOGC no. 3826 - 20/02/2003 p. 3326).

Digital records and access

- Royal Decree 263/1996, of 16th of February, on regulating the use of electronic techniques, computer and telematics by the State General Administration (BOE: 29-02-1996)
- Law 34/2002, of 11th of July, on services of the information society and electronic commerce (BOE no. 166, de 12-07-2002, pp., 25388-25403; correct of mistakes BOE no. 187, de 06-11-2002, p., 28951)
- Law 59/2003, of 19th of December, digital signature (BOE no. 304, de 20-12-2003, pp. 45329-45343).
- Law 11/2007 of 22nd June, on electronic access of citizens to public services (BOE no. 150 de 23/6/2007).
- Law 30/2007, of 30th of October, on Public Sector Contracts. (BOE no. 261, de 31/11/2007).
- Law 56/2007, of 28th of December, on Measures to Promote the Information Society (BOE no 312 de 29/12/2007)
- Decree 56/2009, of 7th of April of 2009, for the impulse and the development of electronic means to the Administration of the Generalitat (DOGC 31430 C 5360 – 16.4.2009).

Protection of personal data

- Organic Law 15/1999, of 13th December, on the Protection of Personal Data (BOE no. 298, de 14-12-1999).
- Royal Decree 1720/2007, of 21st of December, on approving the development regulation of the Organic Law 15/1999, of 13th of December, on The Protection of Personal Data (BOE no. 17 – 19.01.2008).

Documentary heritage

- Law 16/1985, of 25th June, on the Spanish Historical Heritage (BOE no. 155, de 29.06.1985).
- Law 9/1993, of 30th of September, on the Catalan Cultural Heritage (DOGC no. 1807, de 11.10.1993).

Records management and Archives

- Law 10/2001, of 13th July, of archives and records (DOGC no. 3437, de 24.7.2001)
- Decree 52/2006, of 28th of March, on composition and operation of the National Archives Council (DOGC no. 4604, de 30.03.2006).

Appraisal (access)

- Decree 13/2008 of 22nd January of 2008, on records access, appraisal and selection (DOGC no. 5056, de 25.1.2008).
- Order of 15th October 1992, passing the general criteria for records appraisal and selection and the corresponding proposal model (Official Journal of the Government of Catalonia (DOGC no. 1688, of 30/12/1992)
- Order of 13th of January of 1994, on the National Records Appraisal and Selection Committee teams (DOGC no. 1865, de 25.2.1994)., modify by Order of 2nd of February of 2001 (DOGC no. 3328, de 15.02.2001)
- Order of 8th de February of 1994, for adopting rules for the implementation appraisal and selection schedules (DOGC no. 1865, de 25.2.1994).

Relevant norms and standards

The following international norms and standards have been identified as being particularly relevant to the research at hand:

- ISO 15489-1. Information and documentation: records management. Part 1: General. (UNE-ISO 15489-1:2006)
- ISO 15489-2. Information and documentation: records management. Part 2: Guidelines (UNE-ISO/TR 15489-2:2006)
- MoReq 1 – Modelo de Requisitos para la Gestión de Documentos Electrónicos de Archivo: Especificación MoReq
- MoReq 2 – Model Requirements Specification for the Management of Electronic Records.
- ISO 14721:2003 Space data and information transfer systems — Open archival information system — Reference model
- ISO/TR 15801:2004 Electronic imaging — Information stored electronically — Recommendations for trustworthiness and reliability
- ISO 19005:2005 — Document management — Electronic document file format for long-term preservation — Part 1: Use of PDF 1.4 (PDF/A-1)
- ISO 27001:2005 Information technology — Security techniques — Information security management systems — Requirements
- ISO 23081-1:2006 Information and documentation — Records management processes — Metadata for records — Part 1: Principles
- ISO/TS 23081-2:2007 - Records management processes — Metadata for records — Part 2: Conceptual and implementation issues
- ISO 22938:2008 - Electronic content/document management (CDM) data interchange format
- ISO 32000-1:2008 — Document management — Portable document format — Part 1: PDF 1.7
- UNE-ISO/TR 18492:2008 — Conservación a largo plazo de la información basada en documentos
- ISAD (G) Norma Internacional General de Descripció Arxivística. Segona Edició, 2002.
- ISAAR(CPF): Norma internacional per a registres d'autoritat d'arxivístics, Primera Edició,1996.

- ISAAR(CPF): International Standard Archival Authority Record for Corporate Bodies, Persons, and Families, Second edition, 2004
- ISAF: International Standard on Activities/Functions of Corporate Bodies, 2007
- ISDIAH: Norma internacional para describir instituciones que custodian fondos de archivo, Primera edició 2008
- Norma de Descripció Arxivística de Catalunya (NODAC), 2007

Development of e-Administration (e-Government) in universities (Spain and Catalonia)

The *Conferencia de Rectores de las Universidades Españolas* (CRUE) is an association formed by Spanish universities, both public and private. To date, it has associated 50 public universities and 24 private universities. It was formed in 1994 with the goal to provide Spanish universities with a meeting point and a place to debate and discuss. Under its mandate, CRUE's main functions are to promote and develop higher education and university research, cooperation with universities, and interchange among Spanish universities.

Comisión sectorial de Secretarios Generales

Within CRUE is a commission named the **Comisión sectorial de Secretarios Generales**. Created in 2000, this commission's goals and functions are the debate of basic functions and the flow chart of general secretaries in Spanish universities.

CRUE-TIC[1]

Another commission within the framework of CRUE is the **Comisión sectorial de Tecnologías de la Información y las Comunicaciones (CRUE-TIC)**. This commission, created in 2003, is formed by a team that focuses its work in the implementation of new technologies of Information and Communication into Spanish universities.

The objectives of the Commission are:
- to advise and to propose to the CRUE all the topics to be considered in the area of information technologies and communications to improve the quality and efficiency of the Spanish universities; and
- to assess the needs and applications of these technologies in management, teaching and research, and to propose actions and joint projects based on these assessments.

Since its inception in 2003, CRUE-TIC has produced a lot of recommendations and reports about the integration of TICs into the Spanish university system.

Conferencia de Archiveros de Universidades Españolas (CAU)

The *Conferencia de Archiveros de las Universidades Españolas (CAU)* was created in 1994. This conference is considered as a permanent event of the *Comisión sectorial de Secretarios Generales*. The principal aim of the CAU is to promote cooperation between archivists in universities in a few common lines of work. The goal of this cooperation is to help university administrations achieve greater efficiency in their records management.

Inside the CAU, there are many teams working together in different areas related to the archivists' competence, functions and activities such as human resources, organization, appraisal, etc., including one that is exclusively dedicated to electronic records management.

ACUP - Universitat de Catalunya[2]

The Catalan Association of Public Universities (ACUP) is made up of the eight public universities in Catalonia. Established in 1997 with the aim of providing an essential voice for these universities, the ACUP both represents and promotes them. The Association's mission is to support the work of its member universities and unite their strengths so that they may share knowledge and good practices. It therefore also calls for a diverse higher education sector that offers benefits to everybody.

Through its priority on the promotion of quality university training and research, the ACUP fosters activities that contribute to the social, cultural and economic development of Catalonia by encouraging advances in the building of a society based on knowledge. At the same time, the ACUP encourages efficient cooperation between the associated universities and other organisations, on both national and international levels, through the exchange of information and studies, reports and recommendations.

The Association therefore acts as a coordinator of the university community in defining the priorities of the Catalan university system and of the collective negotiation of the interests of public universities with the Catalan Parliament and the Generalitat de Catalunya.

Cooperation among Catalan public universities is therefore a response to the volition for a joint approach in ensuring the continuation of the country's progress. From this ambition, based on the principles of autonomy, Catalan spirit and modernity that have characterised Catalonia's university history, the ACUP is working for the future.

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[1] See http://www.crue.org/.
[2] See http://www.acup.cat/.

White Paper on the University of Catalonia

ACUP considers that the present, marked by the globalisation of society and the economy, is the ideal time to produce and present the *White Paper on the University of Catalonia: Strategies and Projects for the Catalan University*, since it is the moment when the European universities are immersed in the development process of the European Higher Education Area (EHEA) and the European Research Areas (ERA).

The *White Paper on the University of Catalonia* seeks to provide a document for general reflection on matters of university policy and, at the same time, a common roadmap for the Catalan public universities, within the framework of ACUP, to work jointly on this process of reform and to ensure its success.

Once the *White Paper* is written and presented, ACUP wants to launch a debate between the Catalan and Spanish university communities, with contributions from public institutions and organisations in the business, social and cultural sectors of Catalonia and Spain as a whole.

Towards a new university model: the University of Catalonia

The goal of the *White Paper* is to weave a network and a future project, called *University of Catalonia*, among the Catalan public universities, with a view toward engendering mutual cooperation and developing a collective strategy. The concept of the *University of Catalonia* project as a cohesive university system that is territorially balanced and coordinated, with a common aim and unique, yet complementary, institutional profiles, forms the nucleus of the *White Paper* and comprises and structures the rest of the proposals.

The *University of Catalonia* is made up of one of the largest university communities in southern Europe, with more than 250,000 students, some 14,000 lecturers and 7,000 administrative and services staff, offering a rich variety of courses, with some of the strongest research groups in the European and international ambits.

The new university model proposed in the *White Paper*, beyond the *University of Catalonia's* transversal strategy, is defined in terms of six aspects of the university model and four major instrumental aspects necessary to put it into place. With regards to the model, the new university must be more committed to society, democratic values and Catalan culture. The education it offers must be high quality, student centred and integrated into the European Higher Education Area. It is important for it to be an active research university in the centre of the scientific, technological and cultural system and it should serve as an impetus for development, innovation and wellbeing. In these times of globalisation, the university should be European and also have a global vocation. Finally, it should be a university that generates equality and opportunities for advancement.

The four instrumental aspects that have enabled the construction of this new university model include: responsive staffing policies, aimed to promote talent and confidence; broad institutional autonomy and a robust system of accountability; a good system of governance and an efficient management model; and an adequate model of financing based on clear objectives and projects.

Strategies and projects for building the University of Catalonia

The added value that the *White Paper* is able to bring is not one of additional data and diagnostics on the situation of universities, but above all, proposals to effectively build a new university in the short and medium term.

For that reason, the main part of the *White Paper* contains a series of specific strategies and projects that are planned for the coming years. There are a total of 64 strategies and 73 projects that propose lines of action that will promote a broad debate in the heart of the university community and in society in general for the construction of the university.

Section 3.10 of the *White Paper*, "A University based on good governance and efficient management," includes strategies and projects to develop e-Administration in Catalan universities. For example, Strategy number 57 is "Increase professionalization and innovation in public management of universities," and Project number 64 is "e-University" – Improve innovation across use of information and communication technologies." It is in this context that all archivists and records managers of Catalan universities are working together (in teams) to develop methodologies, procedures and guidelines to create, manage, appraise and preserve electronic records.

Vital records: an overview

What is a vital record?

In the context of this research, a vital record is defined as a file or record that is indispensable for the university's operation (acts of governing bodies, records of marks, student records and all those files or records that are considered as such) and that would ensure the continuation of university activities following a disaster.[3]

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[3] See Regulation of the Administrative Archive of the UPF. Available at http://www.upf.edu/arxiu/.

What is a vital records program?

For this research, a vital records program is defined as a series of actions that are carried out in order to protect and preserve the vital records of any organisation so that in case of natural disaster (fire, flood, earthquake, etc.) the organisation can continue to carry out its functions and activities.

Why implement a vital records program?

The rationale for a vital records program is to protect certain types of unique and original records belonging to any organisation by means of the duplication or transfer of the information to different media and to different repositories in anticipation of the accidental or occasional loss of information.

What actions are carried out within a vital records program?

The following actions are identified as being integral to the development and implementation of a vital records program:

1. Description of the program
   a. Definition
   b. Objective
   c. Aims
   d. Responsibilities
2. Identification of vital records
3. Classification of vital records
   a. Denomination of the records series
   b. Location within the classification scheme
   c. Coding of the new records series
4. Appraisal of the vital records
   a. Production of records appraisal and disposition schedules
5. Diplomatic and documentary treatment
   a. Formalisation of the vital records
      i. Guidelines for the formalisation of vital records (unit responsible: Secretariat of the governing body, unit or administrative service)
      ii. Pre-admission to the University Archive (unit responsible: University Archive)
      iii. Technical revision of vital records (unit responsible: University Archive)
      iv. Drawing up the relevant control instrument, e.g., form (unit responsible: University Archive)
6. External contracting of digitising services:[4]
   a. Report establishing the technical and statistical requirements of the work to be carried out by the company (included quality plan)
   b. Search for information on companies
   c. Contact companies
   d. Request for estimates
   e. Production of budgets
   f. Processing of budgets
   g. Assessment of budgets
   h. Selection of a company and production of the corresponding report
   i. Notification of the company
   j. Establishment of the schedule for the work to be carried out
7. Digitising and microfilming
   a. Receipt of the vital records
      i. Production of document transfer and delivery print-outs (unit responsible: University Archive)
   b. Collection of the vital records
   c. Digitising and microfilming work according to the indications laid down in the technical report on the work to be carried out and the schedule of activities
   d. Transmission of the original documentation to the Archive
   e. Design, production and assembly work on the optical and microform media
   f. Transmission of the duplicated documentation to the Archive
   g. Review of all of the material
8. Archival treatment
   a. Transfer
   b. Identification
   c. Classification

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[4] Where the Archive does not have the necessary human or technical resources.

        d.   Archiving
        e.   Description
        f.   Storage
              i.   Request for acceptance into an external Archive
              ii.   Production of the corresponding agreement
             iii.   Signature of the agreement
             iv.   Transfer of the documentation to the external Archive
              v.   Registration of the location of the duplicates in the database

9. Management of costs for the digitising and microfilming work

The Research Project

The proposed research project involves a case study—following the InterPARES 3 Project's established case study workflow and methodology and involving the Universitat Pompeu Fabra—on the preservation of vital electronic records in universities. At present, the research problem has been identified, and the procedures for data collection are under development. Miquel Serra, from the University of Girona will serve act as a collaborator for the project.

Context of the research

Based on the preliminary findings of a case study developed by the Univeristat Pompeu Fabra (UPF) Archive in collaboration with the Universitat de Girona Archive, this paper addresses the preservation concerns identified earlier in relation to the preservation of vital e-records of universities, focusing specifically on the following research questions: How can we identify and classify vital e-records? What are the characteristics of vital e-records? What are the best strategies for creating and maintaining vital e-records? How should we appraise vital e-records? How we can guarantee the authenticity (identity and integrity) and accessibility of vital e-records? Which are the best formats for visualization and preservation of vital e-records? How can we describe vital e-records? Which metadata are necessary? What type of system is needed to keep and protect vital e-records?

Research questions

With regard to the questions that arise during the research phase of the UPF case study, it first of all must be made clear that there are two points of departure to be studied in the case study. These are:

1. The change in format of the vital records; that is, the migration of the vital records of the Catalan public universities in paper format to an electronic format (optical or magnetic); and
2. Vital records produced in a digital environment.

Based on these two situations, and on the research questions that are listed below, an attempt will be made to respond to the matter to be dealt with in this paper; namely, the preservation of vital electronic records in the Catalan public universities, using the UPF case study.

How can we identify and classify vital e-records?

The vital records of the Catalan public universities that exist in traditional formats (mainly in paper format) are identified and monitored using the classification scheme. The usual procedure to be followed is:

1. Detecting all of the archival records that can be classified as vital.
2. Identifying the records series.
3. Naming the records series.
4. Locating the records series within the structure of the classification scheme.
5. Coding the records series.

The classification scheme that is mainly used in the Catalan public universities is functional and it can be said that on a category level (broad functions) it contains the following:

G1 – General administration and organisation.
G2 – Information and communication management.
G3 – Representation and public relations.
G4 – Human resources management.
G5 – Economic resources management.
G6 – Management of movable property.
G7 – Management of immovable property.
G8 – Legislation and legal matters.
X1 – Management of academic resources.
X2 – Organisation of teaching staff.
X3 – Organisation of research.

A list of the vital records of the Pompeu Fabra University Archive, identified according to the classification scheme, is provided in Table 1.

The question therefore emerges of whether this same procedure can be applied in an electronic/digital environment. In addition, to identify and classify vital records, the points made in the following section must be taken into account.

Table 1: Vital records of the Pompeu Fabra University Archive

Class	Classification code	Classification entry	Vital record
G1 – General administration and organisation	1007	Councils	Act of the Social Council (Ordinary session no. 1/02 of 27 June 2002)
G8 – Legislation and legal matters	1328	Statutes	Statutes UPF 2003
X2 – Management of academic resources	1368	Student record	Academic record of Joan Vallfogona Ripoll (Ref. 1258/1995)
	1369	Records of marks	Record of marks for the subject History of Catalonia (Ref. 1487/95)
	1370	Theses	Theses of Economic and Social History in Girona during XV century (Dr. Joan Pol)
	1376	Register of official degrees	Register of official degrees of course 2002/2003

What are the characteristics of vital e-records?[5]

The two subsections that follow outline the real situations/cases that may emerge when creating electronic records, focusing on the case of vital records and they will take into account during developed of case study of UPF.

Docucentric model?

Situation 1 - Docucentric model:

Under the docucentric model, a new governing body, commission etc., is created within the organisational structure of the university, and the decision is made that from the start, records produced and/or received by this body will be exclusively in electronic format. This means that archivists, within the competences and" functions attributed to them, have to provide a solution for the organisation and treatment of this new documentation, which will involve identifying, classifying and appraising the documentation in collaboration with the institutional policy[6] that is decided concerning this documentation in terms of its preservation (e.g., determining the records formats for creation, preservation and access/viewing; determining its authenticity and legal validity—electronic signature, timestamp, electronic evidence).

Datacentric model?

Situation 2 - Datacentric model:

Under the datacentric model, the corporate application of academic resource management in the Catalan public universities involves a minimum of two series of files/vital records: academic records and records of academic qualifications. The information contained in these files/vital records is recorded in the corporate database and, if the universities make the decision to produce vital e-records that serve as the authoritative records purely in digital format, the questions laid down in the previous case study must be considered and, in addition, it will be necessary to decide on the model of document preservation to be used: *datacentric* or *docucentric*. It is therefore necessary to study which is the better option/model for the creation, use and preservation of vital e-records.

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[5]Jordi Serra, *Los documentos electrónicos. Qué son y cómo se tratan* (Gijón: Trea, 2008) (Archivos siglo XXI : 11) ; Jordi Serra, "Gestión y conservación de documentos electrónicos desde la perspectiva archivística: un nuevo escenario de actuación," I també: "La gestión y conservación de documentos electrónicos mediante el sistema BAULA," A: José Luis Blasco y Modesto J. Fabra (eds.), *El documento electrónico: aspectos jurídicos, tecnológicos y archivísticos* (Castelló: Universitat Jaume I, 2008) (Estudis jurídics: 16).

[6] In many digital preservation tasks, it will be necessary to take into account the other university areas and professionals involved. There are many other functions and activities that affect digital preservation and that are outside the strict scope/functions of document management and archival science, e.g., the legal, organisational and technological aspects, etc.

What are the capturing and archiving processes?

The earlier section on vital records outlined the collection and production process for vital records in traditional formats (mainly paper). It is also important to study the same processes in a digital environment. In addition to this, in terms of the archiving of vital e-records, a study will be made of whether the archiving procedure that is used for conventional e-records can be used, or whether security and access measures and controls will need to be increased. This is therefore linked to the sections studying security and access.

Certified digitisation

Reference must be made to Law 11/2007 of 22 June on electronic access of citizens to public services and, in particular, to article 30, which outlines the process for making an electronic copy that serves as an authentic copy. Certified digitisation can be defined as the technological process that allows the image contained in a paper document to be converted into a coded digital image in line with any of the standard formats in general use and with an appropriate resolution.

In this section, it will be necessary to study whether certified digitisation is required for vital records in paper format and what the process is that is to be followed, to determine what the legal, technological[7] and human (responsibilities)[8] requirements are that affect the process and, lastly, to decide on what the preservation formats should be. The approach will focus on deciding which vital records require certified digitisation when migration is to be carried out from the traditional format (paper) to a digital format (optical or magnetic), especially when the paper originals are to be destroyed. The approach will be based on the following options: (1) electronic copy taken from a non-electronic original, (2) paper copy taken from an electronic original or (3) electronic copy taken from an electronic original. For example: A records series, including original vital records (in paper format), to which the vital records program has not been applied and which have been damaged by a flood. It is sometimes possible to use technology (scanners) to digitise this type of damaged documentation.

On a national level, we can look at the e-billing[9] system as a reference project including legislation developed specifically for this case.

Another aspect that is of interest and that must therefore be considered and studied is the printing in paper format of vital records that have been digitised using digital certification or that have been produced in an entirely digital environment that guarantees their authenticity and legal/administrative validity, as outlined in Law 11/2007 of 22 June and reference regulations.[10]

Generation/production in a digital environment

The feasibility of the InterPARES guidelines and the recommendations of the two models proposed by InterPARES for the creation, maintenance and preservation of electronic records—the Business-driven Recordkeeping (BDR) model and the Chain of Preservation (COP) model[11]—should be studied to check whether the procedures recommended are appropriate in the context of the Catalan universities. International standards, regulations and legislation must also be taken into account. It will be necessary to study whether when vital e-records are produced (original copies and security and preservation copies) these have any specific characteristics with regard to other conventional electronic records (e.g., from a security perspective, a legal perspective, etc.).

With regard to the previous paragraph, for collection and production processes it will also be necessary to take into account the section "*How can we guarantee authenticity and accessibility?*," as in the two collection systems proposed, new vital e-records that are generated must also be authentic and therefore the necessary elements must be applied to ensure, guarantee and preserve their authenticity (for legal and administrative purposes).

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[7] Technological in this context refers to both hardware and software. There are two levels of requirements: on the one hand, that the machinery used can guarantee the quality reproduction of the data and that the software used can deal with the image it receives from the scanner correctly, can produce formats that provide a guarantee of preservation and, in the case of optical character recognition (OCR), that the option of later processing is available. For example, a document using today's OCR technology may not be able to read a doctor's handwriting, but it may be that in a few years it can. In addition to technological migrations to maintain the document, it must also be possible to re-read it to see if this new reading recognises the content better.

[8] See: Montserrat Canela and Miquel Casademont, *La funció dels arxius avui: el miratge de la cruïlla*, Revista Catalana d'Arxivística (Barcelona: Associació d'Arxivers de Catalunya N. 26, 2007), 13–56, to see news competences and functions of archivists.

[9] See: Order EHA/962/2007 of 10 April developing specific rulings on digital invoicing and electronic preservation of invoices contained in Royal Decree 1496/2003 of 28 November passing the regulations on invoicing requirements (*Spanish Official Gazette* (BOE) number 90 of 14 April 2007); and the Resolution of 24 October 2007 of the Spanish Tax Administration Agency concerning procedures for the approval of digitisation software as outlined in Order EHA/962/2007 of 10 April 2007. Available at http://www.facturae.es/.

[10] Here, for example, there would be the case of PDF with frames, verification barcodes, sending paper with a validation code for accessing the original, etc.

[11] See: Terry Eastwood, Hans Hofman and Randy Preston, "Part Five—Modeling Digital Records Creation, Maintenance and Preservation: Modeling Cross-domain Task Force Report," in *International Research on Permanent Authentic Records in Electronic Systems (InterPARES) 2: Experiential, Interactive and Dynamic Records*, Luciana Duranti and Randy Preston, eds. (Padova, Italy: Associazione Nazionale Archivistica Italiana, 2008), 225–303. Electronic version available at http://www.interpares.org/display_file.cfm?doc=ip2_book_part_5_modeling_task_force.pdf.

How can we appraise vital e-records?

In Catalonia, the collegiate body in the technical sphere that has access, appraisal and selection functions is the National Committee of Records Access, Appraisal and Disposition (CNAATD).[12] Legislation from 1992 on the appraisal of public records lists a series of criteria chosen by the National Committee of Records Access, Appraisal and Disposition[13] that are fundamental and that must be taken into account when deciding on the lifecycle of records and, therefore, on its preservation and/or destruction. Since this research is considering vital records, which are *automatically* intended for permanent preservation, the study will focus on seeing whether these criteria can serve as a basis for identifying vital e-records for their appraisal. These criteria are listed below:

Criteria for record appraisal and selection (Preservation criteria):[14]
1. Preserve text records that provide information on: the origins of the entity; its organisation; the evolution of the structures, political functions, programmes and activities.
2. Preserve records that provide information on the process of drawing up the laws and regulations affecting the entity.
3. Preserve text records that enable an assessment of the impact or effectiveness of the entity's programmes or activities.
4. Preserve records that supervise the internal operation of the entity in terms of: delegation of authority; power relations; schools of thought.
5. Preserve records containing significant information on: an event; an individual; an institution; a place.
6. Preserve records containing significant information on important events, movements or trends in political, economic and social history.
7. Preserve records that contain significant information on science and technology.
8. Preserve records containing necessary information for the protection of civil, financial or legal rights or other rights of individuals, institutions or the entity itself.
9. Preserve records that significantly complete the information contained in other document fonds or series.
10. Preserve records that respond to the requirements of statistical analysis and quantitative history.

These criteria will therefore help, particularly in a digital environment, to identify and classify vital e-records within the new type of electronic records produced in line with the new university competencies, functions and activities. It should be noted that, in the case of vital records, resolutions on disposal and retention should automatically be permanently preserved.

Another interesting aspect to highlight is the collaborative records appraisal and selection work carried out by the Catalan public universities through the CNAATD-linked working group: the GATDU (University Document Appraisal and Selection Group).[15] The proposals for records appraisal and disposition schedules of specific series within the Catalan public universities that the GATDU works on and presents to the CNAATD are used to decide on the vital nature of the records that made up the document series under appraisal. In this respect, therefore, collaborative work will be a key factor for identifying and apprising vital records in the Catalan public universities.

In terms of records appraisal and the disposition schedules of vital e-records in the proposals presented to the CNAATD, it will be necessary to determine the long-term preservation methods (preservation format, treatment of electronic signatures, etc.). The functional model/procedure of the appraisal of electronic records that is proposed in the InterPARES 2 COP model will also be taken into account.[16]

How can authenticity and accessibility be guaranteed?

Digital certification and signature / time-stamping

In Catalonia, the Catalan Digital Certification Agency (CATCert)[17] is responsible for offering and providing digital certification services to the Catalan public administration and to businesses. As a digital certification agency, CATCert offers: Creation of Certification Authorities; Creation of Registration Entities; Provision of certification; Platform of identification and signature services (PSIS); Electronic signature tools; idCAT; Classification of digital identities and attributes; Consultancy service; iArxiu; PASSI; Virtual signature office, ASCD; CATCert seal; and Training.

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[12] See: CNAATD and Decree 13/2008, on records access, appraisal and selection (*Official Journal of the Government of Catalonia* (DOGC) no. 5056, of 25/01/2008). Available at
http://www20.gencat.cat/portal/site/CulturaDepartament/menuitem.d81d04123ceb3b8fda97dc86b0c0e1a0/?vgnextoid=7469adf74e99f010VgnVCM1000008d0c1e0a
RCRD&vgnextchannel=7469adf74e99f010VgnVCM1000008d0c1e0aRCRD&vgnextfmt=default and also Article 19 of Law 10/2001.

[13] At this point in time, the CNAATD was the National Records Appraisal and Selection Committee and only had the functions of appraisal and selection.

[14] See: Order of the Minister for Culture of 15 October 1992, passing the general criteria for records appraisal and selection and the corresponding proposal model (Official Journal of the Government of Catalonia (DOGC) no. 1688, of 30/12/1992). Available at
http://www20.gencat.cat/portal/site/CulturaDepartament/menuitem.d81d04123ceb3b8fda97dc86b0c0e1a0/?vgnextoid=95c9adf74e99f010VgnVCM1000008d0c1e0a
RCRD&vgnextchannel=95c9adf74e99f010VgnVCM1000008d0c1e0aRCRD&vgnextfmt=default.

[15] See: Order of 13 January 1994, on the working groups of the National Records Appraisal and Selection Committee, modified by the Order of 2 February 2001.

[16] See: Eastwood et al., "Modeling Digital Records Creation, Maintenance and Preservation," ibid; and Jordi Serra, "L'avaluació dels documents electrònics," in *Postgrau de Gestió dels Documents Electrònics (ESAGED)*, Barcelona (Spain), February-March 2009 (unpublished) .

[17] See: http://www.catcert.cat/web/cat/index.jsp.

It will be necessary to decide which elements of this range of services and products are required to guarantee the authenticity of the vital e-records,[18] such as what type of digital certification we require, the legal and technological format of the electronic signature, time-stamping, etc. For this section, we will work in collaboration with and with consultancy from CATCert, taking into account that the archivist and head of the CATCert iArxiu project, is a member of the TEAM Catalonia.

Above all we must emphasise that, when generating copies of vital records for the security and preservation of these records, it is important to consider whether these copies must have the status of originals and, therefore, whether it will be necessary to apply all of the elements required for this (electronic signature, timestamp, electronic evidence service, etc.) logically, in collaboration with the human resources of each institution for legal, technological and organisational tasks (collaborative, multidisciplinary interdisciplinary work).

Access

On a national level, and in line with regulations on access[19] to and protection of personal data (Spanish[20] and Catalan), it will be necessary to determine what type of treatment should be applied to vital records given that many of them are subject to restricted access (e.g., wage slips, staff records, academic records, etc.); in a digital environment, we must consider how these should be protected.[21]

As noted above, in 2008 the National Committee of Records Access, Appraisal and Disposition, through Decree 13/2008 of 22 January on records access, appraisal and selection (Official Journal of the Government of Catalonia (DOGC) no. 5056, of 25/01/2008), incorporated a new competence and function: access to the public records in Catalonia. Henceforth, the Committee/Commission became the National Records Access, Appraisal and Selection Committee (CNAATD).

This means that if records appraisal and disposition schedules (proposals) for records appraisal and selection are presented to the CNAATD, either through the GATDU working group[22] or on the initiative of each Catalan public university, the Commission's access regime will have to be included. It is at this point that it will be necessary to determine for the case study whether vital records should be subject to more restrictive regulations when accessing the information they contain according to the legislation in place in this regard.

Which are the best formats for visualization and preservation of vital e-records?

During the analysis of viewing formats (representation) and preservation that will be applied to vital e-records, the case study will focus on the analysis of all of the knowledge and recommendations developed by the InterPARES Project, as well as those set forth in ISO standards and in other international and national recommendations, to determine the best policy in this regard. Whether the e-records will be produced using the docucentric or datacentric model must be taken into consideration. In this section of the collaborative, multidisciplinary and interdisciplinary project, this will be a key, basic and essential factor.

How can vital records be described? Are specific metadata required?

When describing vital e-records, it will be necessary to study whether specific metadata must be identified and developed to define and know the position, location and level/state of treatment (within the vital e-records programmes) of the records and what preservation policy must be applied to them. The case study will focus this point on the study carried out within the InterPARES 2 MADRAS project;[23] the METS model[24] and MoReq 2 (appendix 9)[25] will also be taken into account.

Which digital repository(ies) can be used? Where should vital e-records be preserved?[26]

In Catalonia, the Catalan public universities, like the rest of the public administration, can use a secure digital repository of the iArxiu[27] as a technological solution and tool. The iArxiu project is an electronic archive service that CATCert offers to the

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[18] According to legislation (Law 30/1992, Law 59/2003 - digital signature and Law 11/2007 e-access to public services). See also:
Luciana Duranti (traducció, Alejandro Delgado Gómez), *La conservación a largo plazo de documentos electrónicos auténticos: hallazgos del proyecto internares* (Cartagena : Concejalía de Cultura, 2005) ; and Luciana Duranti and Randy Preston (eds.), *International Research on Permanent Authentic Records in Electronic Systems (InterPARES) 2: Experimental, Interactive and Dynamic Records* (Padova, Italy: Associazione Nazionale Archivistica Italiana, 2008).
[19] Law 11/2007 of 22 June on electronic access of citizens to public services.
[20] Ibid.; and Royal Decree 1720/2007 of 21 December passing the regulation on the development of Organic Law 15/1999 of 13 December on the protection of personal data.
[21] This subject will be directly related to the information systems protection and security policy of each university.
[22] Order of 2 February 2001 modifying the Order of 13 January 1994 on the working groups of the National Committee of Records Access, Appraisal and Disposition (Official Journal of the Government of Catalonia (DOGC) no. 3328, of 15/02/2001). Available at
http://www20.gencat.cat/portal/site/CulturaDepartament/menuitem.d81d04123ceb3b8fda97dc86b0c0e1a0/?vgnextoid=95c9adf74e99f010VgnVCM1000008d0c1e0a
RCRD&vgnextchannel=95c9adf74e99f010VgnVCM1000008d0c1e0aRCRD&vgnextfmt=default.
[23] See: http://www.gseis.ucla.edu/us-interpares/madras/guidelines.php. See also: Anne Gilliland et al., "Part Six—Investigating the Roles and Requirements, Manifestations and Management of Metadata in the Creation of Reliable and Preservation of Authentic Digital Entities: Description Cross-domain Task Force Report," in *International Research on Permanent Authentic Records in Electronic Systems (InterPARES) 2: Experiential, Interactive and Dynamic Records*, Luciana Duranti and Randy Preston, eds. (Padova, Italy: Associazione Nazionale Archivistica Italiana, 2008), 305−359. Electronic version available at
http://www.interpares.org/display_file.cfm?doc=ip2_book_part_6_description_task_force.pdf..
[24] See: http://www.loc.gov/standards/mets/mets-home.html.
[25] See: http://www.moreq2.eu/.
[26] Miquel Casademont, Daniel Cantalosella and Miquel Serra, "*Informe iArxiu com a solució tecnològica d'arxiu electrònic segur*," (Girona, 2008).

Catalan public administration for the long-term preservation of electronic records. Its aims are to: (1) preserve electronic records securely; (2) ensure the validity of the electronic signatures incorporated into records; and (3) guarantee access, recovery and use of the stored records. As such, the iArxiu provides a repository for electronic records preserved in the most appropriate formats for digital objects and, therefore, guarantees, in the long term, the authenticity, integrity, security, access, recovery and viewing of the records.

The iArxiu is indispensable due to its comprehensive document management system, which takes into consideration the *entire* lifecycle of records. The iArxiu platform, which was developed based on *ISO SO 14721:2003 Space data and information transfer systems—Open archival information system—Reference model*, is depicted in Figure 1.
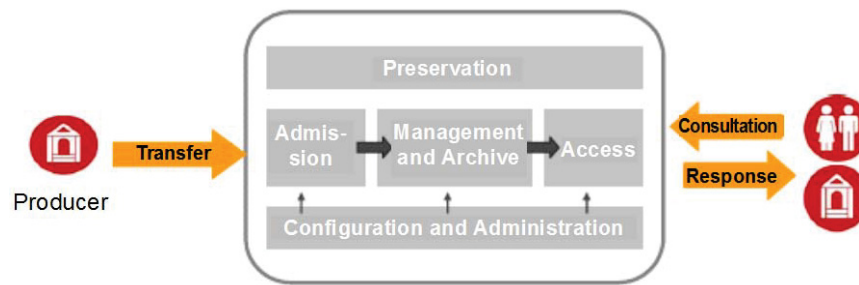

Figure 1. iArxiu Platform Reference Model

To guarantee the preservation of the records when the vital e-records programme is applied, it will be necessary to study the following three options to decide where the vital e-records should be preserved:

1. Data servers (magnetic format): A first original copy in the institutional repository (university), plus a second copy (original or copy) in the iArxiu (CATCert or other institution installations).
2. Data and optical servers: A first original copy in the repository (of the university or the CATCert iArxiu) and a second copy (original or copy) in optical format (in installations outside of the university that have the optimum conditions for optical formats).
3. Data, optical and microfilm servers: Option 2, plus a third copy in microfilm format (stored in an external institution with the optimum storage conditions).

For the preservation of vital records, the applicability of the two records management models proposed by the InterPARES 2 Project (i.e., the BDR and the COP models) must also be studied. In addition, the iArxiu must be tested as a long-term digital records preservation solution.

With vital electronic records (both the original copies and the original copies/security and preservation copies) as digital assets within the information systems of the Catalan public universities, the risk analysis methodologies such as MAGERIT[28] and the auditing of digital repositories such as DRAMORA[29] must also be taken into account. If the Catalan public universities implement these methodologies within their information security systems, they must take their archives and their staff into account.

Expected results

It is anticipated that this study will result in a set of best practices, a list of recommendations and/or a protocol of actions for identifying and producing, treating, describing, protecting and preserving vital records in electronic format.

Author Biography

Miquel Serra Fernàndez received his Bachelor's degree in History from the Universitat de Girona (1999) and his Master's degree in Records Management and Archival Studies from Universitat Autònoma de Barcelona and Associació d'Arxivers de Catalunya (2002). Since then he has been working in public archives as an assistant technician in Arxiu Històric Comarcal de Santa Coloma de Farners, Arxiu Nacional de Catalunya and Arxiu Municipal de Vidreres. Since 2002, he has been records manager and archivist of Universitat de Girona Archive. He is working with different teams of records managers and archivists in Catalan (Grup de Gestió Documental, Workflow and iArxiu—Associació Catalana d'Universitats Públiques, 2008) and Spanish (Grup de Gestió Documents Electrònics—Confereneica de Archiveros Universitarios, 2008) universities and in the Catalonia government (Grup d'Avaluació i Tria Documental d'Universitats—Generalitat de Catalunya, 2005, and Grup Innovació Tecnològica—Generaltiat de Catalunya, 2009). He is on the Board of the Assoicació d'Arxivers de Catalunya (2005). Since 2007, he has served as Director of TEAM Catalonia in the InterPARES 3 Project.

[27] See: http://www.catcert.cat/web/cat/1_4_9_iArxiu.jsp.

[28] See: Methodology for Information Systems Risk Analysis and Management (MAGERIT version 2). Available at http://www.csae.map.es/csi/pg5m20.htm.

[29] See: Digital Repository Audit Method Based on Risk Assessment (DRAMBORA). Available at http://www.repositoryaudit.eu/.