Certification and Quality: A French Experience

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ABSTRACT
The CINES has two main missions, among which is the long-term preservation of French scientific data. To provide this service, CINES deployed in 2006 one of the first digital repository in France named PAC (Plateforme d'Archivage du CINES – the CINES preservation system).

In order to secure this mandate in the long-term, it is absolutely crucial for CINES to prove the quality of the services it provides to the French higher education and research community. For this purpose, the CINES strategy relies on the adoption of a quality assurance approach which includes the certification of its repository.

Over the past four years, the PAC staff ran not less than five audits, internal as much as external. Various systems of reference have been used: some were at the national level (National Archives accreditation), others were at a European level (Data Seal of Approval accreditation, DRAMBORA) or even at an international level (ISO 16 363, TRAC).

From these audits, the strengths and weaknesses of the digital preservation repository have been highlighted. Action plans have been put together and executed to improve the service quality. The aim of transparency, which ranked first in the certification initiative, also reinforced the trust of the user community toward the long term digital preservation service of the CINES. Based on such an experience, the PAC staff is now willing to share its knowledge and feedback with the rest of the community, by participating in think tanks as well as standardization workgroups.

Categories and Subject Descriptors
H.3.7 **[Information storage and retrieval]**: Digital Libraries – *Standards, Systems issues.*

K.6.4 **[Management of Computing and Information systems]**: System Management - *Management audit, Quality assurance.*

K.7.3 **[The Computing Profession]**: Testing, Certification, and Licensing.

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General Terms
Standardization, Measurement, Documentation, Verification

Keywords
Certification, Audit, Quality, Trust, Long-term Preservation, Archive, Risk Management, Metrics and Assessment.

1. BACKGROUND
1.1 CINES and digital preservation overview
CINES (Centre Informatique National de l'Enseignement Supérieur) is a French IT datacenter for the Higher Education and Research community. This state administration institution employs about 50 engineers, is based in Montpellier and is known worldwide for its HPC (high performance computing) activities. The whole of the CINES means is made available for all the French researchers, who are gathered together in scientific domains. The largest communities to use the CINES computing infrastructure are the fluid mechanics, chemistry and climatology research communities.

As part of this first mission, CINES hosts advanced computers which include Jade (SGI ICE 8200 EX with 267 TFlops peak, 23 040 cores and 700TB of disks), the 7th most powerful supercomputer in Europe and 30th in the international TOP 500 ranking (June, 2011).

The second main activity of CINES is the long-term preservation of records and data with one of the very few operational long-term preservation platforms in France. This archiving repository is called PAC [3] (Plateforme d'Archivage du CINES – the CINES preservation system).

The very first thoughts on digital preservation were given in 2004. In 2006, the first digital PhD theses were archived on PAC-V1 (which was developed internally). Starting march 2008, the documents are preserved on PAC-V2, which relies on the Arcsys software edited by Infotel and on specific additional modules (Ingest module, Archeck – data integrity control application, ArcStats – statistics tool, representation information library…) developed in-house. Four copies are made of the archives: two are kept on hard disk drives, and two are stored on a tape library.

The archival processes are fully automated. The only manual interventions are performed at the beginning of every archive project: appraisal of digital objects to be preserved, data mapping between the producer information system and the CINES metadata model, agreement on file formats, definition of the package structure, user tests, etc. Thus, project after project, the staff of the Digital Preservation Department has increased. At this stage, there are 11 people in the preservation team with different knowledge, skills and experiences. There are:

- ✓ An I/T manager;
- ✓ An archivist;
- ✓ A File formats expert (assisted by an expert on video file formats);
- ✓ I/T developers;
- ✓ System administrators;
- ✓ A XML specialist;
- ✓ Hardware and OS specialists;
- ✓ Service support and monitoring specialists (24x7).

Three types of digital documents are secured on PAC for the years to come:

- ✓ Scientific data generated from observations, measurements or computation;
- ✓ Heritage data like PhD theses, educational data or pedagogics, publications or scientific digitized books;
- ✓ Administrative data from French universities: civil servants' records…

At present, there are about 13 TB of data in the production environment:

- ✓ Digital PhD theses;
- ✓ Scientific papers uploaded in the open repository HAL (Hyper Article on Line) managed by CCSD;
- ✓ Digitized publications as part of the Humanities and Social Sciences program « Persée »;
- ✓ CRDO Multimedia collection (sound files of ethnographic recordings in various languages) as part of the Humanity and Social Sciences program « TGE-Adonis »;
- ✓ Digitized collection of the history of law of CUJAS university library;
- ✓ Digitized collection of books about the History of Medicine (BIU Santé - Inter-university library of healthcare);
- ✓ Digitized works in medicine, biology, geology and physics, chemistry (BUPMC - University Library "Pierre and Marie Curie");
- ✓ Library of photos of the French School of Far East.

CINES has other projects to preserve: "Canal U" CERIMES multimedia collection (audiovisual files of recordings of courses and lectures for school programs and academics), the digitized collection of books of the Sainte Geneviève library, the research documents of the ATILF laboratory (Analyse et Traitement Informatique de la langue Française – analysis and IT processing of the French Language), etc.

1.2 Missions

The boundaries of the preservation mandate are set by domestic laws:

- ✓ A statement (published on August, 7th 2006) which designates explicitly CINES as the national operator for the long term-preservation of electronic PhD theses;
- ✓ A mission letter (issued on February, 12th 2008) which reinforces the CINES mandate on digital preservation for four years.

In order to accomplish this official mission, CINES had to put a great number of resources together, with the objectives to:

- ✓ Create a dedicated department with a specific focus on access and preservation of digital objects on the long-term;
- ✓ Acquire and integrate specific skills (archivistic, project management, development competencies);
- ✓ Roll out a dedicated technical environment and share the infrastructure in place for the parallel computing activities;
- ✓ Be proactive and put in place an initiative to professionalize the activities and the business processes, improve the communication (conferences, trainings, etc.) and rationalize the strategy.

2. CERTIFICATION: GOAL AND STRATEGY

2.1 What is the rationale for certification?

Since the engagement letter issued by the Ministry of Higher Education and Research initially limits the mandate to a four years span, CINES must prove itself and lock the mission in the long term given the importance of the financial, technical and human resources required to execute it. A dedicated department has been set up for this purpose in 2008, with about ten engineers. CINES also put in place an important organization, which will only be relevant from an economic point of view if archived volumes increase significantly and CINES settles its legitimacy. Thus, the main objective of the approach is to get an official recognition that would allow to:

- ✓ Label the service;
- ✓ Legitimate its qualification;
- ✓ Become a professional in the French digital preservation community that cannot be ignored;

- ✓ Get a strong marketing point to develop the service with other communities;
- ✓ Communicate with the funding bodies.

One of most important criteria for certification is the viability over time of the mission entrusted to the organization. But in the Cines strategy, certification is a mean to legitimate its organization and establish the continuity of its mission, as well as a guarantee of fulfillment of the mission entrusted by the Ministry. These two conditions are obviously in conflict, and there are difficulties to change them into a virtuous circle.

In order to reach its certification goal, CINES bases its preservation and quality strategies on adaptation and use of standards such as:

- ✓ ISO 14 721 (Open Archival Information System);
- ✓ AFNOR NF Z42-013, French recommendations about conception and utilization of systems with data to preserve;
- ✓ Dublin Core (no qualified);
- ✓ A CINES standard based on ISAD-G and ISAAR (CPF) for project PDI;
- ✓ PAIMAS (Producer-Archive Interface Methodology Abstract Standard);
- ✓ Standard d'Echange de Données pour l'Archivage (SEDA), a French standard developed by DAF/DGME about archives exchanges (transaction and metadata schemes are described) [19];
- ✓ P2A - Politique et pratiques d'archivage – sphère publique, policy and pratices about preservation in a French public environment [13];
- ✓ Etc.

The certification process should be seen as an evaluation tool that encourages the preservation team to adopt more standards and to maintain a high quality service level.

2.2 The strategy toward certification

Much more than a simple management tool, the audit (ever more when internal) allows the repositories that adopt this technique to develop a deep knowledge of the way they operate, in a transverse manner.

In this context, CINES kicked off a certification process in which the main phases are:

- ✓ Permanent analysis and assessment of the different applicable standards to the CINES digital preservation department (started in 2008);
- ✓ Grant of the Data Seal of Approval accreditation (2008-2011);
- ✓ External audit (Ourouk consultants [22], Paris) for pre-certification, based on preservation standards : TRAC, DRAMBORA, ISO 16363 and ISO 14721 (2009);
- ✓ External audit for national agreement given by SIAF, a national service for coordination between Archives (2010);
- ✓ Participation in the EU funded APARSEN test audit project (Alliance for Permanent Access to the Records of Science Network) (2011);
- ✓ External audit for the CINES repository ISO 16363 certification (2012).

The timeline of the figure 1 shows this course of audits.

The strategy of CINES is to cover a large spectrum of standards and to increase the level of complexity required by the targeted certifications over time. Thus, the standards used for the first PAC certification were simple and based on auto-evaluations. The closer CINES gets to 2012 (the end of the span of the preservation mandate as per the mission letter issued by its Ministry), the more complex the certification standards are, to reflect the latest acquired experience and competencies.

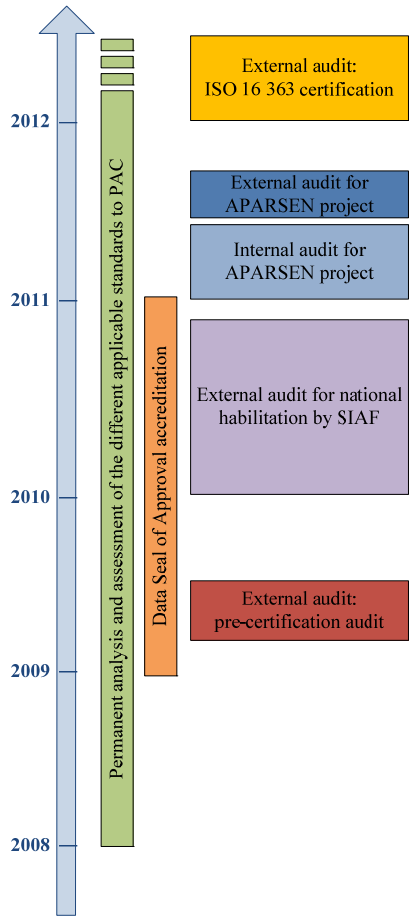

Figure 1. CINES strategy for certification.

Furthermore, the standard chosen for the "final certification" (the external audit in 2012) should sound familiar to the Ministry of Higher Education and Research. So, the future ISO 16 363 standard has been chosen for this: firstly, because it is an international standard and, secondly, because this draft describes

the preservation activity in CINES with more relevance than standard as ISO 9001:2008.

Even if the preservation mandate is renewed in 2012, the certification strategy should continue with periodic audits and improving quality assurance of the service.

3. QUALITY ASSURANCE: PREPARATION and IMPLEMENTATION

3.1 Policy

Any quality process needs policy and encouragement of the organization head. So, the quality strategy must be a part of the global organization strategy. In CINES, certification is a way to have a long term mission, one of the strategic goals.

In addition to these requirements, few elements were essential in the organization:

- ✓ First, communication is very important to avoid any rejection by the team. Consequently, the strategy for the evolution of the legal context (mission) was explained, regular meetings detailed the choices made, as well as plannings, relationships between team members and audit process, progress and results of audits, consequences of audits on daily work, etc. The active involvement of all the staff was decisive to identify nonconformities and execute an efficient and relevant audit.
- ✓ Second, transparency and honesty from the management are important too. At CINES, the certification approach is part of a constructive policy: its final objective is the realistic evaluation of the services provided to the communities, not a mean for the reorganization of the department. In other words, the independence and fairness of the auditors of the repository was a key factor in success.
- ✓ Last, the skills of the auditor are very important for the certification process to be fruitful and valuable. The knowledge and know-how of the auditors have been very much appreciated, during the internal and external audits.

3.2 The lack of relevant systems of reference – a difficulty for CINES

While producing a report, in 2008, on the state-of-the-art of existing certifications, CINES had highlighted the lack of specific, recognized business standards in the non-archivistic community. Year after year, a large growth of the certifications standards can be observed, among which:

- ✓ 2006-2007 : the methodology for self-assessment the Digital Repository Audit Method Based on Risk Assessment (DRAMBORA), developed jointly by the Digital Curation Centre (DCC) and Digital Preservation Europe (DPE);
- ✓ 2007 : TRAC "Trustworthy Repositories Audit & Certification (TRAC) : criteria and checklist";
- ✓ 2009 : Data Seal of Approval, developed by DANS;
- ✓ 2011 : ISO 16 363 ("audit and certification of trustworthy digital repositories");
- ✓ 2011 : ISO 16 919 ("requirements for bodies providing audit and certification of candidate trustworthy digital repositories");
- ✓ 2011 – 2012 (?): French standard for certification based on the NF Z42-013 standard.

The early adoption of the criteria defined in audit systems of reference as well as other standards such as ISO 14 721 ("Reference Model for an Open Archival Information System") will help anticipating and resolving the problems bound to the development and production phases of digital repository infrastructures. By the mean of simple analysis, audits and/or self-evaluations, the regular study of preservation systems of reference can support the quality of the services provided.

3.3 Preliminaries: process documentation and DRAMBORA audit

Whatever the chosen standard, the documentation of the business processes is a prerequisite for any certification. From 2009 to 2010, CINES detailed its preservation activities through process maps and descriptive sheets. Fourteen processes have been identified and split into three categories: "management processes" (the processes that govern the operation of a system), "operational processes" (the processes that constitute the core business and create the primary value stream) and "supporting processes" (which support the core processes). The outcome of this initiative was partially presented during the iPRES2010 conference [1], and can be accessed online on the CINES website [2].

In the meantime, a first audit was executed internally in 2009, based on the DRAMBORA framework and online tool [9]. These works were coordinated by an archivist who had attended the specific training courses organized jointly by the Digital Curation Centre (DCC) and Digital Preservation Europe (DPE). The results of this audit have led the CINES to define a tailored risk management plan: thirty eight main risks have been identified and defined from the seventy eight risks listed in DRAMBORA. Each identified risks is assigned to a member of the digital preservation department. The risk management plan is reviewed twice a year by the whole staff, with the objective of reevaluating the probability and impact of each risk, defining action plans to mitigate them, etc.

4. CERTIFICATION: AUDIT TIME

Following the DRAMBORA audit and the completion of a substential part of the required documentation, CINES executed more audits based on more standards and a growing complexity.

4.1 2009: Pre-certification audit

When the first external audit of the CINES digital preservation repository was being negociated, no particular system of reference or standard had been imposed. The selected provider suggested to build a customized audit grid based on:

- ✓ The coming ISO 16 363 standard [8];
- ✓ TRAC [10];
- ✓ The checklist of the NESTOR project [15];

- ✓ The preservation policy audit grid as developed by the French Agence Nationale de la Sécurité des Systèmes d'Information [13];
- ✓ The OAIS conceptual model - ISO 14 721 [16];
- ✓ The French NF Z42-013 standard[14].

The resulting grid was filled by external consultants from evidences found in the documentation or observations from interviews with the staff. It was included in the final report which was structured as per the ISO 16 363 recommendations.

The workload associated to this audit represented nineteen man-days, and was done by two senior consultants. They interviewed the whole staff of the Digital Preservation Department as well as the members of CINES management.

The evidences provided to prove the compliance with the quality standard were:

- ✓ Documents (preservation policy, functional and technical specifications, process maps, event journals, etc.);
- ✓ Demonstrations of systems (functionalities like ingest, storage, data management, access, etc.);
- ✓ Documents and/or demonstrations of tools supporting business processes (ECM, etc.);
- ✓ Analysis of approaches for technology watching;
- ✓ Interviews.

From the report, actions plans have been defined and quickly put in place. The diagram below depicts the distribution of the criteria assesment for each type of recommendations.

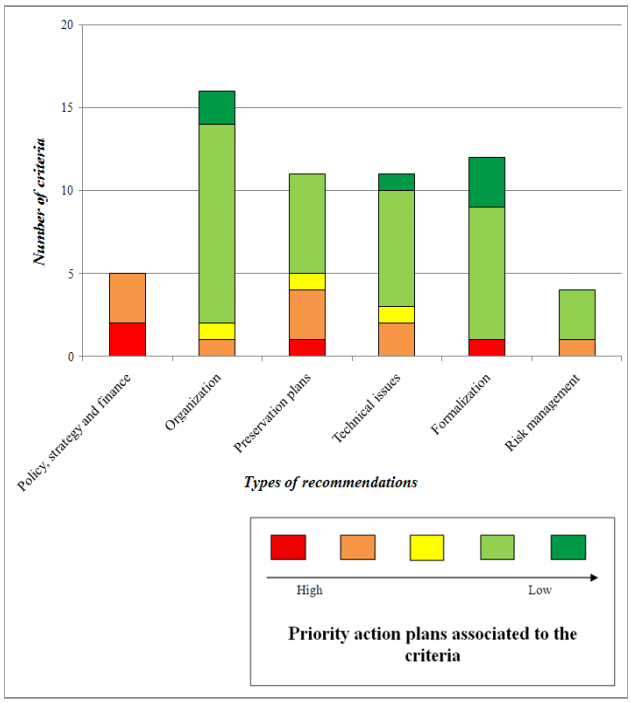

Figure 2. Criteria by types of recommendations (2009 external audit).

Thanks to this pre-certification audit, the CINES management and the middle management identified that priority actions were more related to policy, strategy, finance and preservation plans rather than on organizational aspects.

4.2 2010: Data Seal of Approval accreditation

The accreditation DSA Data Seal of Approval [5] is attributed to the digital preservation centers, for establishing quality assurance procedures to ensure accessibility and intelligibility of information entrusted to them.

The Data Seal of Approval was initially established by DANS in the Netherlands in 2007. A couple of years later, a number of institutions committed to durability in the preservation of research data took over to take the DSA to the european level. The current members of the DSA Board are:

- ✓ Alfred Wegener Institute (AWI), Germany;
- ✓ Data Archiving and Networked Services (DANS), Netherlands;
- ✓ UK Data Archive (UKDA), United Kingdom;
- ✓ Deutsche National Bibliotek (DNB), Germany;
- ✓ Max Plancke Institute (MPI), Netherlands/Germany;
- ✓ Inter-university Consortium for Political and Social Research, University of Michigan (ICPSR), United States;
- ✓ Centre Informatique National de l'Enseignement Supérieur (CINES), France.

By assigning the seal, they not only wish to guarantee the durability of the data concerned, but also to promote the goal of durable archiving in general.

It consists of sixteen guidelines split in three topics – data producer, repository and data users – with the objective to raise awareness on the importance of quality and ensure that in the future, research data can still be processed in a reliable manner, without entailing new thresholds, regulations or high costs.

To get the accreditation, which is based on trust, the repository has to submit a request on the web. In a description of the repository to be assessed, it should be explained that:

- ✓ The research data can be found on the Internet;
- ✓ The research data are accessible, while taking into account relevant legislation with regard to personal information and intellectual property of the data;
- ✓ The research data are available in a usable format;
- ✓ The research data are reliable;
- ✓ The research data can be referred to;
- ✓ The data producer is responsible for the quality of the digital research data;
- ✓ The data repository is responsible for the quality of storage and availability of the data: data management;
- ✓ The data consumer is responsible for the quality of use of the digital research data.

In 2009, CINES tested a first version of DSA with its digital preservation repository (PAC). It now complies with the 2010 guidelines version 1 set by the Data Seal of Approval Board. The

repository has therefore been granted the Data Seal of Approval for 2010 on March 15, 2011.

4.3 2010: external audit for national habilitation by SIAF

Since 2009, the French law allows organizations to store and preserve on the national territory some public records (non-heritage) provided that they have received an habilitation from SIAF (Service Interministériel des Archives de France). CINES, as a public institution and given the need expressed by its community, decided to position itself on this sector. The requirements from SIAF consist of twenty-two technical, operational, organisational, strategic and legal criteria. Such a level of demand relies on the standards of the domain such as ISO 14 721 and NF Z42-013.

In june 2010, CINES completed and sent a file to the Archives de France in order to officially request an habilitation. After few months of investigation, a group of eleven experts visited the CINES facilities and interviewed its representatives before issuing the habilitation on December 14th, 2010, for the next three years.

SIAF also provided a list of conditions and recommendations for the renewal of this habilitation, some of which had not be identified during the previous audits. CINES has already taken them into account in a specific action plan.

4.4 2011: internal audit for APARSEN project

APARSEN [6] is a european initiative led by the Alliance for Permanent Access to the Records of Science. Among the objectives of this EU funded project is the test audit of six digital repositories based on the ISO 16 363 standard, half of them being based in Europe, and the rest in the United States. This is also part of an initiative from the European Commission, started in 2010 to promote the rollout of a framework for the audit and certification of digital repositories. This framework would federate the different accreditation and certification project into three levels of recognition of the quality assurance effort done by institutions in charge of the preservation of the digital heritage, in increasing trustworthiness:

- ✓ Basic Certification through the Data Seal of Approval (DSA);
- ✓ Extended Certification through DSA plus additional publicly available self-audit with an external review based on ISO 16 363;
- ✓ Formal Certification after full external audit and certification based on ISO 16 363.

A memorandum of understanding [7] has been put together and signed by the different parties involved in this framework during the summer 2010.

The European datacentre being audited as part of the APARSEN projet were:

- ✓ The UK Data Archive (UKDA), United Kingdom;
- ✓ The Data Archiving and Networked Services (DANS), Netherlands;
- ✓ The Centre Informatique National de l'Enseignement Supérieur (CINES), France.

The experts in charge of the internal audit at CINES were :

- ✓ Olivier Rouchon, head of digital preservation department;
- ✓ Marion Massol, project manager (PAC);
- ✓ Jean-Pierre Théron, system administrator (PAC).

They were chosen because they have a good understanding and knowledge of the digital preservation process or the functional and technical management of preservation projects in PAC. Their recommendations in the final report have been made from assessment and observations. While trying to be as impartial as possible, the auditors have based their assessment on the following :

- ✓ Compliance in the 2009 external audit ;
- ✓ Improvement of compliance as part of the completed action and/or produced documents ;
- ✓ Gap between available documents and requested artefacts.

The internal audit performed as part of the APARSEN test audit project took place in four phases :

- ✓ A preliminary study (analysis of the reference document, definition of the scope of the audit, preparation of the main deliverable – report document in French, planning) ;
- ✓ An internal audit (evaluation and documentation of the criteria fulfillment in French, translation of the report in English language, additional interviews and verifications, gap analysis with the 2009 external audit report) ;
- ✓ The preparation of the documentation requested by the external APARSEN auditors ;
- ✓ The validation of the internal audit report/summary.

The workload for this internal audit was evaluated around sixty man-days.

The internal auditors set the functional scope of the audit on organisational and technical (management of digital objects, infrastructures, risk management in general, etc.) aspects.

The preliminary work in the internal audit anticipated a lack of evidences for the "access" functionalities as defined in the OAIS. The rationale for this is bound to the CINES policy/strategy to limit the access to archives to the sole data producers(aka transferring agencies), because most of them have their own websites for access and dissemination. The CINES repository will only provide a copy of their archives to the institutions in the event they have lost their copy or it has become obsolete. As of yet, there is no direct access to the archives for a larger community of users. A couple of studies have been conducted, and even if the technology is available in the CINES repository, there are no needs expressed by the user communities that would justify a complete process documentation and deployment.

The assesment of the criterias bound to security proved to be complex: in order to be relevant, such an evaluation must include the entire infrastructure used for digital preservation. Yet, a significant part of the infrastructure is shared with the HPC activities of the datacentre ; any security initiative has to include the whole CINES structure. Thus, such a work implies a lot of

efforts, resources involvements, etc. It has been started, under the resposibility of the RSSI (person Responsible of the Security of the Information System) but is not yet completed.

4.5 2011: external audit for APARSEN project

The external audit was executed on June 6th and 7th by twelve independant international experts nominated by the APARSEN consortium:

- ✓ Simon Lambert(United Kingdom);
- ✓ Donald Sawyer (USA, MD);
- ✓ Barbara Siermann (Holland);
- ✓ Robert Downs, CIESIN (USA, NY);
- ✓ David Giaretta(United Kingdom);
- ✓ Bruce Ambacher(USA, MD);
- ✓ John Garrett (USA);
- ✓ Terry Longstreth (USA, MD);
- ✓ Helen Tibbo (USA);
- ✓ Kevin Ashley (United Kingdom);
- ✓ Marie Waltz (USA, Chicago);
- ✓ Steve Hughes(USA, CA).

The audit started with an overview of the CINES approach and implementation to provide long term preservation of digital objects, followed by a visit of the facilities and a demonstration of the repository capabilities. Then, the auditors reviewed the report produced as part of the internal self-audit, and a question/answer session helped clarifying the remaining ambiguities.

As a conclusion, the auditors expressed remarks and recommendations for CINES to improve te quality of the services provided, where necessary.

The other objective of the APARSEN audit was to gather feedback from the institutions being audited as to the relevance and usability of the criteria listed in the standard. In some ways, it helped clarifying the ISO 16363 criteria evaluation system (methods/model for criteria appraisal, characterization of mandatory/optional compliances, etc.), as some questions were raised during the self-audit on this particular topic, and should be clarified in the final version of the standard to be published by the end of 2011.

The diagrams below (figures 3 and 4) show the progress made in the evaluation of the ISO 16363 criteria between 2009 and 2011 :

In the figures 3 and 4 above, the bubbles size, which are proportional to the labeled numbers, reflect the number of criteria with a given level of assesment and degree of importance, as per the respective evaluations. The area for improvement is clearly the criteria shown in red ; these have been adressed through action plans with high priorities. From the figure 2 (same legend for colors), we understand that the recommandations made for the criteria to be improved dealt with policy, strategy, finance, preservation plans and formalization of the activity.

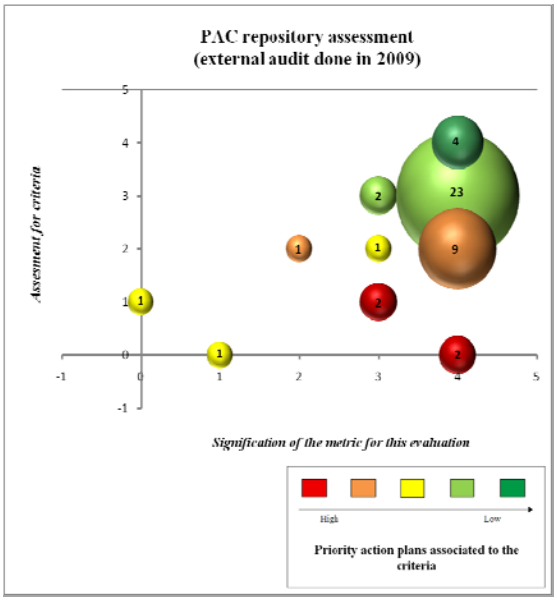

Figure 3. PAC repository assessment (2009 external audit).

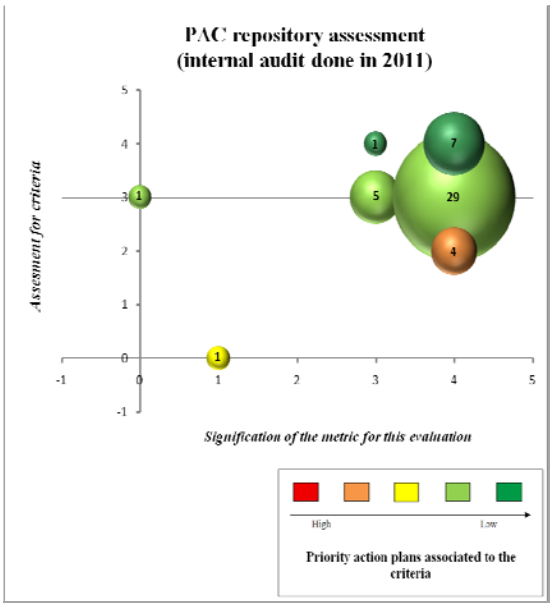

Figure 4. PAC repository assessment (2011 internal audit).

As a result, in 2009 and 2010, the CINES management focused on the improvement of these criteria. The outcome of the internal audit executed in 2011 confirms the efficiency of the action plans implemented over this period. Now, thanks to this last audit, CINES management can easily point that the criteria depicted in orange (assesment = 2 / 4) are the next to require to be actioned.

In the meantime, these audits allowed to find out some critical aspects which had never been met by the repository, among which:

- ✓ The gap in the level of knowledge within the team, and in the distribution of critical activities with the staff;

- ✓ The lack of end-to-end traceability for the object integrity during the ingest phase, that led to the obligation for the data producer to provide an initial checksum;
- ✓ The lack of formalization of some specific topics or processes (disaster recovery plan, business continuity plan, etc.).

As part of the deliverables, the auditors also provided additional reports that allowed to back the demand to ensure the continued existence of the CINES mandate and financing.

Even if the external auditors are not necessarily aware of the specific culture of the audited repository and staff, their fresh eyes on the project proved to be extremely valuable to argue the evidences, back some projects to improve quality (development of new internal modules for the repository, validation of contracts by a lawyer, etc.) and even suggest interesting things to look at and think about (potential strategic developments, internal communication improvement, etc.). From this point of view, the fact that the external auditors belonged to the digital preservation community and had a strong expertise of the domain was key to the success of the initiative.

5. CONCLUSION AND FUTURE WORK

The certification initiative that was kicked-off four years ago has been a great vector for the improvement of the quality of the services provided. Thanks to the documentation of the service activities, the problems bound to knowledge and competencies management between the members of the staff have been greatly resolved.

This experience and knowledge sharing goes beyond the sole PAC team and affects the whole community (shared technology watching, exchanges and feedback on issues, solutions, etc.). For this purpose, CINES participates in few workgroups, at the national level (groupe PIN [23], Commission Archivage Électronique de l'AAF [24], etc.) as well as the international level (Alliance for Permanent Access, Data Seal of Approval, EUDAT, etc.).

CINES is also willing to promote traceability and transparency toward its users : its preservation policy is available online on the CINES website, along with documentation intended for data producer to give an overview on the way archive projects are managed at CINES. This path through certifications contributes to reinforce the trust of data producers, funding bodies management or users toward the digital preservation platform and services.

Boosted by this experience, CINES is now willing to participate in standardazing activities, particularly in the certification domain. For this purpose, a member of the staff will join the ad hoc group responsible for the drafting of the yet to be AFNOR certification standard based on NF Z42-013 and NF Z40-350. Two other members of the staff are currently participating in the SEDA steering comittee, which objective is the improvement of the French standard d'échange de données pour l'archivage (SEDA) led by the Archives de France.

The outlook for 2012 and beyond relies on this outcome:

- ✓ Become a national reference in the digital preservation community;
- ✓ Get the ISO 16363 certification as soon as an organization provides audit and certification of candidate trustworthy digital repositories;
- ✓ Reinforce the participation in digital preservation standardization activities – at national and international levels.

In parallel to this certification approach, CINES is also moving its services toward the preservation of scientific data and datasets, which are produced by HPC systems for example. The CINES certification would indeed have a large impact of the success of such a project, which is planned to go live in 2012.

6. ACKNOWLEDGMENTS

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