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The Human Face of Digital Preservation: Organizational and Staff Challenges, and Initiatives at the Bibliothèque nationale de France

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Abstract

The process of setting up a digital preservation repository in compliance with the OAIS model is not only a technical challenge: libraries also need to develop and maintain appropriate skills and organizations. Digital activities, including digital preservation, are nowadays moving into the mainstream activity of the Library and are integrated in its workflows.

The Bibliothèque nationale de France (BnF) has been working on the definition of digital preservation activities since 2003. This paper aims at presenting the organizational and human resources challenges that have been faced by the library in this context, and those that are still awaiting us. The library has been facing these challenges through a variety of actions at different levels: organizational changes, training sessions, dedicated working group and task forces, analysis of skills and processes, etc. The results of these actions provide insights on how a national library is going digital, and what is needed to reach this longstanding goal.

Dissemination of skills and tasks

The Digital Library Department was created within the BnF in 1998, and more or less retained all activities related in one way or another to the digital world and the Web:

- Web archiving first experiments
- Selection, cataloguing and digitization of material for Gallica (<http://gallica.bnf.fr>), BnF's digital library
- Development of the digital library system for online access to this material
- Editorial and technical management of BnF's institutional website (www.bnf.fr)
- Editorial and technical management of BnF's intranet.

Only the infrastructure and storage of the digital material for Gallica wasn't managed by the Digital Library Department, but by the IT Department.

By then, the approach was to isolate and to preserve digital activities from the traditional workflows of entries, cataloguing, access and reference. Digital definitely meant "different".

A first step towards dissemination

It took a decade to shift from this vision to the current situation, where digital activities are closely articulated with traditional library skills. A series of organizational changes were achieved:

- the team in charge of digitization joined the Preservation and Conservation Department, thus facilitating the convergence of reproduction workflows and the shift from analog (microforms) preservation reproductions to digital ones, and starting to integrate digital preservation as one of the main conservation strategies at BnF;
- the team in charge of the selection and acquisition of books for Gallica was transferred to the Cooperation Department, thus emphasizing the evolution of the digital library towards shared selection workflow and tools at national level;
- the team in charge of managing the digital library's website and architecture joined the IT Department, which created a suitable environment for scalable processes and formal development methods;
- the team in charge of BnF's institutional website joined the Communication Delegation, thus acknowledging the website as a communication channel among others.

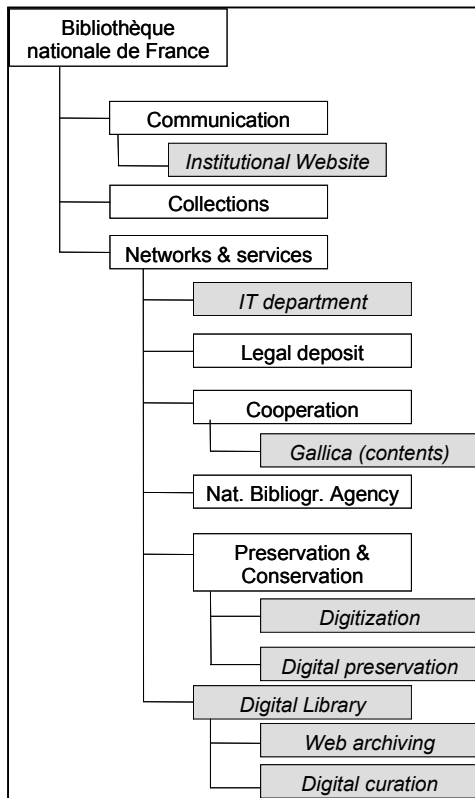


Figure 1 - Organization chart in 2008: first step towards dissemination

Finally, in late 2007, the only activities left in the digital library department were Web archiving on one hand, and digital curation on the other. Digital curation involved innovative projects, research and development, and participation in the design of the digital preservation repository. This activity had a strong link with the digital library, the team having been involved in the design and making of Gallica2, the new version of the digital library. The team was also in charge of the creation of the OAI-PMH repository for digital documents and the conversion of bibliographic data to adapted standards such as Dublin Core.

Digital preservation activities and organizations

Regarding the digital preservation activity, from 2003 it became a priority for BnF and its development was shared between the Conservation and Preservation Department, the IT Department, and the Digital Library Department. Preservation and Conservation was in charge of defining guidelines and standards for digitization and archiving, as well as assessing the needs for the infrastructure together with the IT. A tender for the digital preservation and archiving storage infrastructure was issued in 2005. The IT also conducted a comparative study on the state of the art of existing OAIS implementation frameworks. The Digital Library Department got involved

when it came to the functional specification and software requirements for BnF's digital preservation repository, SPAR (Système de Préservation et d'Archivage Réparti) and its compliancy with the OAIS model.

These leading departments also committed to a mission of dissemination of skills and expertise within all entities of the library, as well as joint efforts with the IT for defining the requirements of the system. The digital library team always had this twofold concern of building operational systems while explaining, training and accompanying the library staff for these new tasks which need to be, at some point, integrated in the library's workflows.

Activities associated with digital preservation, from 2003 to 2007, thus involved the previously mentioned departments as project leaders, but never without the active contribution of other parts of the library, especially Audiovisual Department, and corresponding members from several collection departments. The digital preservation activity started to be really a shared process through the regular meetings of dedicated working groups, and the settlement of a project management organization with a steering committee.

Standardization was also a major activity for leveraging collaboration. Staff from the cited departments was involved in the five year revision process for the OAIS model (ISO 14721) along with the National Bibliographic Agency, who contributed their expertise to the standardization process. Staff from the National Bibliographic Agency had also been involved in the choice of a metadata model for the preservation repository (a combination of METS and PREMIS).

Starting in 2008, the development of the software part of the SPAR repository (Bermès et al. 2008) required a shift in the methods of change management support within the project. Digital preservation needed to be moved into the mainstream and operational workflows of the library, in order to set up the adequate context for the system to run.

This change followed three main directions.

It was first decided to do away with the Digital Library Department, and to disseminate associated expertise (and supposedly, staff) within other existing departments. No digital library department was needed anymore, when the entire library had become digital. This was first envisioned in late 2007 and became officially effective, after in-depth negotiations with staff from both ends as well as BnF management board, in April 2008.

The Web archiving activity was attached as a new service within the Legal Deposit Department.

The Conservation and Preservation Department strengthened its forces dedicated to digital preservation, and fostered preservation expertise tasks. A "Preservation charter" was issued, dedicated to formalizing good practices and gathering energies around conservation activities, including digital preservation responsibilities.

Regarding the digital curation activity, the suppression of the Digital Library Department also led to a strong reorganization of the National Bibliographic Agency which became, on this occasion, the Bibliographic and Digital Information Department. This new name was associated with a broadening of its functions, now involving digital information management as well as traditional bibliographic expertise, along with a reinforcement of the links with the IT in the process of designing the information system. These activities include a contribution to digital preservation activities, but rather focussed on metadata issues.

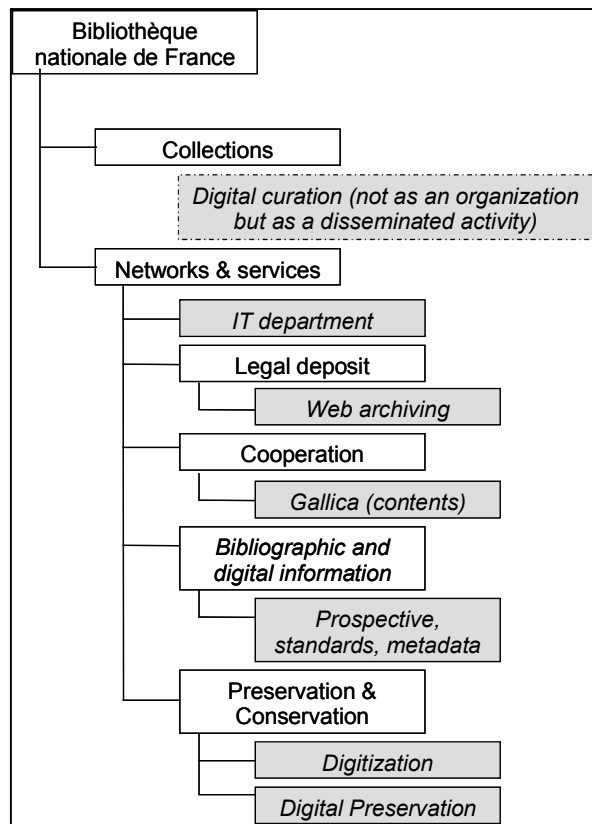


Figure 2 - Organization chart in 2009: dissemination of digital activities

In the meantime, the IT Department also changed some of their processes in order to have a project management based organization and to merge the development of the bibliographic information system with the development of the digital information system.

Skills and staff solutions

Second, a complete training session of seven days on digital information management was created to disseminate the skills in the library. This training session was first proposed only to the staff from the former National Bibliographic Agency, as a support for the organizational

change, and later on as an open session for the whole library staff in 2009.

This training includes an introduction to digital libraries, digital documents, and digital preservation, and then three optional tutorials, one on metadata and protocols (including semantic web technologies), one on user-oriented design (including usage studies, accessibility and usability, and the Web 2.0), and one on digitization and preservation (including rights management, preservation metadata and persistent identifiers).

1. Digital information initiation	2. Data models for digital information	3. Project management in the digital environment	4. From digitization to long term preservation
-Definition of the digital Library and user-oriented design	-Metadata standards : Dublin Core, MPEG21 DIDL, MarcXchange	-Project management methodology	-Presentation of the digitization workflow
-Definition of digital material / digital heritage	-The OAI-PMH protocol	-User studies	-File formats for digitization
-Search and retrieval mechanisms, search engines, protocols	-An introduction to Semantic Web technologies	-GUIs usability and accessibility	-An introduction to SPAR, the digital preservation repository
-An introduction to digital preservation and the OAIS model	-Semantic Web technologies tutorial (RDF and SPARQL)	-An introduction to the Web 2.0 : use in libraries	-Persistent identifiers
-An introduction to XML (optional)		-Functional requirements for digital libraries, search engines and catalogues	-Preservation metadata (METS, PREMIS)
			-Digital rights management

Figure 3 - Training programme for Digital information management, as of 2009

In 2009, about 100 staff members took the introductory training, and 20 to 50 staff members attended at least one of the other tutorials. These figures may seem low compared to the total staff of the library (around 2500 full-time equivalents) but they're still significant when compared with the number of staff actually involved in digital operations.

Third, targeted actions in the organization and human resources perspective were initiated in collaboration with the Human Resources Direction, aiming at facilitating the definition of needed processes and human support for digital tasks (including digital preservation), and at preparing further change and adoption of digital activities within BnF. This specific challenge will be addressed more in-depth in the following sections of this paper.

Pressing need for clarity: trying our hand at digital organizational studies

Changes initiated by the dissemination of specialized staff have been amplified by the growing reach of digital activities, in particular mass digitization and digital preservation. Organizations and workflows in digital preservation always were a concern, from the beginning of

the SPAR project. However, in 2008, the instruction of a digital preservation related project faced obstacles in such a way as to make conducting an organizational study across BnF, and a long-term project on the impacts of digital changes in the library, unavoidable.

A two-fold plan

The implementation of a digital preservation system at BnF has been tied from the beginning to the development of an application named Solon, aimed at managing digital rights in a dynamic way (Martin 2007). In the fall of 2008, the working group in charge of this application was nearing completion of its work on GUIs when it realized that its knowledge of existing workflows in digital rights management was insufficient to ensure Solon would match the requirements of all its potential users. This led to acknowledge the need for a broader evaluation of BnF's changes under digital influence. A two-fold plan was set up by a dedicated working group.

The agents that had been working on Solon would conduct a survey of existing practices in digital rights management, in order to allow the development of the application to continue. This was named Solon-ORH, which stands for Organization and Human Resources;

A longer-term study of the impact of the multiplication of all things digital across the library would also be launched. The project is called ORH-ION (Organisation et Ressources Humaines, Impacts Organisationnels du Numérique: Organization and Human Resources under Digital Influence)

Solon-ORH: a tryout in digital organizational studies

Digital rights management is a library-wide concern, from the legal to the publishing services, including the many departments that contribute to the digital library. The Solon working group, composed of half a dozen people, had to mobilize a vast array of staff. To do so, they convened a meeting with the library executive board in December 2008. The goal of the meeting was to identify the names of agents who have to do with digital rights issues in their day-to-day activity. These agents would be interviewed for the study after being introduced to the project through two additional meetings. This system was meant to build a panel of interviewees based on reliable knowledge of the services' activities.

48 names were submitted and 38 people's testimonies were recorded between March and May 2009, and a formal presentation of the end results to the concerned parties took place on September 25. This represented a respectable amount of work for the six interviewers, who had no formal training in sociology or statistics, nor any dedicated time allotted for this study. A detailed questionnaire was used, in order to compare answers more easily, but quantitative analysis proved impossible due to the variety of situations. Nevertheless, Solon-ORH results allowed the working group to detail and revise its planning based on a

deeper analysis of users' needs, to greatly increase awareness of intellectual property issues and to rally energies to the development of Solon. Further analysis of the future integration of Solon in existing workflows is still needed.

Lessons learnt

Solon-ORH also provided interesting lessons for further studies on BnF's organizational and digital issues. The study was conducted by librarians, with no specific training in such work: more professional guidance and in-house feedback might be required in the future.

The library world is not as uniform as one would imagine, even on such crossover subjects as intellectual property rights, which have been permeating the library's activities for close to 30 years. There might be hope for faster adoption of digital preservation best practices, provided that efforts in raising awareness in this field are maintained. Last but not least, schedule slips are to be expected, as always. Given the variety of profiles in BnF, and the relative newness of digital preservation challenges, time to make these issues one's own cannot and should not be compressed: speed might be counter-productive.

Betting on the long term: a study of learning organizations

Organizing a study on organizations proved to be a challenge on its own. The working group was composed of as many representatives as possible from every library department involved in or impacted by digital preservation, but it faced issues of legitimacy vs. inertia, innovation vs. good enough, inside knowledge vs. outside supervision, or pragmatism vs. long-term thinking. It proved a lesson in patience and caution: the bigger the institution, the more coordination is needed, and the harder it is to recruit a large number of participants.

The strong commitment of the Department of Human Resources was instrumental in bringing the project to fruition: they are a natural ally on these questions, and were able to provide methodological support in this type of study, although they are also unsure about these new developments in BnF's structures and skills.

In the end, in spite of delays in both the projects motivating the study and in the organizational study itself, the results obtained as of summer 2009 turned out to be a useful survey of BnF's current situation and a stepping block for the future.

A scoping study

ORHION started with a very ambitious plan and a very tight schedule. The working group was composed of a dozen members, 4 from the Department of Human Resources and 8 from library services closely involved in collection digitization and digital preservation. Its initial mandate, as approved by BnF's management, was to

supervise a three-folded action over the course of a year: a preliminary study, a detailed enquiry with the help of a consultant, and a first implementation. Speed seemed essential then due to the digital preservation and digital rights management systems schedule; as their starting date was pushed back, the preliminary study did not have to be so rushed, and more time was available to reflect on what the study's ultimate goals should be.

This scoping study was conducted from October 2008 to May 2009, when 17 key players in BnF's digital domain were interviewed, following a half a dozen themes. Its objective was not to find solutions to whatever organizational problem might appear, but to identify what the problems were, and to learn from the ideas and doubts expressed by the staff working in the digital domain. To analyze the answers, strong positions and notable ideas that came forward in the interviews were written down when they appeared in repeated readings, whether in a positive or negative way. From this first sifting through the collected data, six main wishes emerged, as well as a list of what was expected of ORHION.

Six wishes

1. Clarify the institution's policy
2. Define priorities

This first couple of wishes reflects concerns about BnF's digital strategic vision and leadership: although the library has always been clear on setting digital as one of its top priorities, more detailed guidelines were needed.

Digital is a relatively new, fast evolving domain. The foundations of BnF's policy have been stated in several official documents: the library's performance contract with the Government, and its Digital Roadmap, a high-level document charting the library's activities and objectives related to new technologies. These documents do not seem sufficient yet to establish the new array of missions as a permanent part of the library's life: these initiatives are still considered by many agents as temporary experiments, and there is no drive to conduct a thorough exploration of what digital entails for BnF as a whole.

Moreover, many worry about digital activities as additional work, while financial and human resources remain constant: executives wonder what they should focus their agents' efforts on. They look forward to a more thoughtful approach to balancing the workload, and expect decision making processes designed to determine whether an activity should be reduced or phased out, while keeping in line with BnF's missions.

3. Define what a digital collection is
4. Facilitate transverse workflows

While the first two needs expressed in the study involved BnF's policy and top level decisions, other concerns were expressed about the operational level of digital developments at the library.

First and foremost is the quasi philosophical question of what exactly a "digital collection" is. The phrase is

bandied about by agents working on digital documents, in training sessions on digital preservation, or in discussions on the library's evolution, particularly in the context of digital "collection management" or "curation". This notion emerged as part of the work on the OAI functional model and the ways to implement Preservation Planning in BnF's preservation system, but it is truly far-reaching in its implications. The definition of what the digital collection (collections?) is, and what it actually means to curate it, can only be found in relation to the library's collections as a whole and to the diversity of users' practices; it will require clarification at a strategic level as well.

For now, we can already see that digital projects require more collaboration between services than most of the library's former tasks. What the preliminary study confirmed is the tight integration of all activities that revolve around digital preservation, from the selection of digital documents to create or collect, up to the delivery to the end user. BnF's current structure is quite hierarchical, with entities focusing on certain types of collections, or certain technical workflows. Transverse committees do exist, but they are perceived as lacking decisional power. Most interviewees felt work was needed to develop workflows that span easily across organizational borders, as it is tentatively done with the introduction of project and product managers for digitization campaigns or BnF's digital library.

5. Develop skills
6. Analyse the evolutions of job qualifications

These last two wishes fall more closely in the traditional realm of human resources: revisiting job requirements and updating staff skills in order to meet them.

Up to now, the skills needed to cope with BnF's projects in the digital domain have been acquired mostly on the fly, with a small community of experts at the lead. While the agents have maintained the required level of knowledge so far, they worry about their ability to continue to do so in the long run as digital missions become more and more complex and permeating, and about the capacities of others outside this core group to step up to the challenge. There seems to be a wish for guidance in skills management, through an offer tailored to the variety of staff in contact with all things digital, from the IT engineers who run the storage facilities to the electronic resources acquisition librarians who must be able to evaluate the persistence of the material they gather. Due to this diversity of situations, and to the informal ways of gathering knowledge that have found their place in the library so far, the preliminary study's results point to a wide-ranging training plan, including formal lectures as well as tutoring or self training.

This need for a comprehensive and flexible training plan is further challenged by the blurring borders between previously well separated jobs. A strong theme in some of the interviews was the evolving relationships between the functional experts, developers and systems administrators

of the Information Systems Department, and the librarian majority. In the past few years, a bigger part of BnF's staff that was originally trained exclusively in library science has taken an interest in IT matters, through individual inclination and necessity, in order to participate more actively in BnF's digital projects. We have to determine whether this hybridization of skills is bound to develop on a large scale, or whether BnF needs to recruit people with a different record than the homogeneous majority of librarians, or both. The library will have to update its job descriptions accordingly.

Innovative solutions needed

The main lesson from the ORHION experiment could be that there is no ready-made solution to BnF's organizational challenges, and that this is particularly true in the digital domain: since digital preservation and related activities are relatively new at the library and best practices are still being defined at the international level. It should also be no surprise that analyzing organizations in innovative domains such as digital preservation takes time — the first phase of ORHION, which was estimated as a trimester's work, actually took a year to complete. As long as digital has not become an ordinary task in the library, it might be necessary to adjust to the measured rhythm of these learning organizations.

That being said, all the work accomplished on BnF's digital organizations so far shows that there is interest among the agents involved in these subjects and BnF's management as well, in a closer investigation of the changes in the library's structures and skills. In order to reconcile the need to reflect on organizations and job requirements, and the prospective nature of most things digital at BnF, we are looking into unconventional solutions as well.

BnF's digital strategy will be further detailed through its work on a national and an institutional "digital framework". The library was commissioned by the Department of Culture and Communication in 2008 to coordinate a working group that will submit a blueprint for digital actions in libraries, in four areas: digitization, acquisitions, preservation and evaluation. BnF has been working in parallel on its own blueprint for the smooth integration of the digital components of its activities in its traditional missions. The comprehensive accompanying document that will detail each of these activities could be the answer to wishes 1 and 2, and clarify BnF's policies and priorities.

As to the study's fifth and sixth wishes, the Department of Human Resources is planning to review BnF's job descriptions guide while paying special attention to the requirements of digital projects.

Questions 3 and 4, what a digital collection is, and how to facilitate transverse workflows, find no clear-cut satisfying answers in BnF's existing array of structures and actions so far. Given the changing scope of the digital domain in the library, we may have to look for an innovative solution, aiming mostly at developing

awareness by word of mouth, over the long term. BnF might need to monitor the impact of new technologies on its organizations, create a knowledge base from observations inside and outside the library, facilitate experience sharing among staff and foster library-wide participation in mapping BnF's changes. How such goals could be met, and what means would be required to do so, is next on ORHION's agenda.

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