



VIAF: A hub for a multilingual access to varied collections

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Abstract:

With the development of the Semantic Web, persons, corporate bodies and works identification data have gained a major role never equalled in the past. Authority data that libraries provide to control the access points linked to the bibliographic records describing the resources listed in their catalogues, have an established reputation for accuracy, and are therefore considered, as Semantic Web is concerned, as fully trustworthy data.

The following text is dealing with the Virtual International Authority File (VIAF) project, carried out by national libraries and major cultural institutions worldwide, and explains how it may contribute to allow new and stronger capacities, performances plus interoperability, between data which were primarily conceived according to different rules in various languages and scripts. Some VIAF use cases into International, European or national projects are presented to emphasize the new uses of Authority data.

Introduction

Along with the Semantic Web growth, persons, corporate bodies or works identification has gained a role never equalled in the past. Primarily designed in the authority files to manage the access points linked to the records describing the documents listed in their catalogues, these data know a new life on the Web today. The structured data contained in authority records can easily be processed into automatic programs: the preferred form of the name for a person, the variant forms of this name, the related names of the same person, and other data such as the country of birth or his/her biographical dates, years of activity of a corporate body, date of creation of a work, etc. Their reputation of reliability places at once these data among the available trustworthy data.

Why and how will these “authority data” have to and may be able to get rid of their first and almost simple assigned role, to live a new life on the Web? To what extent may the Virtual International Authority File, carried out by national libraries and major cultural institutions

worldwide contribute to this entire new role? How does it allow a feasible interoperability between data initially conceived according to various rules and standards, languages and scripts? What are from now the major big projects that rely on this new tool to develop authority data usages?

1. The reasons for an international authority file?

As early as the 70's, the Universal Bibliographic Control¹ mentioned that each and every national bibliographic agency should not only identify all books published in their country, thanks to an officially issued national bibliography, but moreover, it had to establish the authoritative form of the name of its native authors. The distribution of these authoritative forms in the national bibliographies was supposed to incite all those who reused the bibliographic records to reuse also these preferred access points. But it was without taking into account national usages which infer on the structure of the names, their languages and their scripts, and which make impossible the use of the same form of a given name throughout the world. In 1963, IFLA published the first version of "*Names of Persons: National Usages for Entry in Catalogues*"². In the present days the end-user is our core concern, and it is essential to allow him/her to use the language, the script or the forms of the names he/she prefers when looking for information. How to reconcile coherence and flexibility of the access points in a given catalogue? The authority file seems to be the most adapted tool to manage this apparent contradiction.

One of the functions of a catalogue is to gather, for every author, all his works but only these. It is therefore highly needed that in a given catalogue, we establish for every author an authoritative form of his/her name bearing in mind the end-user expectations. In fact, several factors come to complicate this general frame. On one hand, the users of a given catalogue constitute mostly a heterogeneous group, with their diverse when not contradictory needs. On the other hand, even though a given form of a name is favoured, there must still be the possibility to search the catalogue using alternate forms for this name through access points (considered as excluded forms «see» or related forms «see also») to allow the largest number of users to succeed in their search queries. Even if at the origin of its conception a given catalogue has its own logic and coherent access points, what about after retrospective conversions and diverse files downloads added up over time? Furthermore, bibliographic records, and consequently, the access points attached to them, have been derived for a few decades from a catalogue to another, with the end result of a relative loss of coherence. That is an important element which led every national bibliographic agency to develop its own national authority file. The Library of Congress was a pioneer in its domain as it started to rule a manual authority file, from the end of the 19th Century. It was since computerized! Nowadays the great majority of the authority files which participate in VIAF were born during the last thirty years, and all of them are naturally run through computer systems. We should add that the International Cataloguing Principles³ published in early 2009 state that: "Authority records should be constructed to control the preferred forms of names, variant forms of name, and identifiers used as access points" (§6.1.1.1). The Virtual International

¹ Anderson, Dorothy. *Universal Bibliographic Control: a Long Term Policy, a Plan for Action* (München: Saur, 1974)

² The 4th edition published in 1996 is under revision. The printed version is no more available, but a PDF file may be consulted at: <http://www.ifla.org/node/4953>

³ Statement of International Cataloguing Principles. Retrieved 1st June 2011 from http://www.ifla.org/files/cataloguing/icp/icp_2009-en.pdf

Authority File (VIAF) goes a bit further by putting in relation the contents of each national authority file of the partner libraries.

2. What is VIAF?

VIAF is an **authority file**, the current scope of which is covering names of persons and names of corporate bodies. Geographic names are still undergoing a test period, and work titles are now planned. However concepts will be excluded as they refer to logic.

VIAF is an **international authority file**:

In 2003, during the Berlin IFLA Congress, was signed the first partnering contract between The Library of congress (LoC), Die Deutsche Nationalbibliothek (DNB) and OCLC Online Computer Library Centre⁴. The BnF signed the agreement in 2007. Since then, partners have rapidly multiplied. In 2010, almost every month a new member joined in.

In June 2011, one accounts nineteen partners for twenty-two handled files. Members are categorized as follows:

| Statutes of the partners | Count |
|--|--------------------------------|
| National libraries | 12 (+ 2 en test ⁵) |
| National or regional union catalogues | 3 ⁶ |
| Libraries of international rank | 1 ⁷ |
| Institution apart from the library world | 1 ⁸ |

The first goal of VIAF is to create links between national library authority files. The preamble of the current cooperation agreement specifies that: “*Such an international virtual authority file would be a practical expansion of the concept of universal bibliographic control that would build on the work done by each national bibliographic agency* ».

Since then, VIAF has included in its ranks other institutions or catalogues of national or international importance, such as union catalogues or major institutions with national or international influence. One must also notice that VIAF has broadened its partnership beyond the library world. The entrance of the Getty file is a milestone in this extension, in the direction of big art institutions.

⁴ The press release which announced the launch of the VIAF project is dated 26 August 2003 (<http://www.oclc.org/research/news/2003-08-26.htm>, retrieved 1st June 2011). VIAF is rooted in an agreement signed in 1998 by the Library of Congress and the Deutsche Nationalbibliothek which allows the reuse of the Library of Congress names of persons' authority records (then in USMARC) by the German National Library in *Personennamendatei*.

⁵ The Library of Congress, the national libraries from Australia, the Czech Republic, France, Germany, Israel, Portugal, Spain, Sweden, Switzerland, Hungaria, and the Biblioteca Apostolica Vaticana. Library and archives Canada and the Russian State Library are in the course of test.

⁶ Istituto Centrale per il Catalogo Unico delle Biblioteche Italiane et per le Informazioni Bibliografiche (ICCU, Italy), Norodowy Uniwersalny Katalog Centralny (NUKAT, Poland) and the Library Network of Western Switzerland (RERO).

⁷ Bibliotheca Alexandrina

⁸ The Getty Research Institute

The geographical origin of VIAF current partners is as follows (taking into account institutions in the course of test):

| Regions of the world | Count |
|---|-------|
| North America | 3 |
| South America | 0 |
| Western Europe | 4 |
| Eastern Europe | 9 |
| North Africa, Near East and Middle East | 2 |
| Oceania | 1 |
| Asia | 0 |

The historic centre of gravity of VIAF is located in the “Western” institutions (North American and Anglo-Saxon countries, Western Europe). The opening towards other regions of the world and, consequently, other cataloguing traditions is a challenge which all members are well aware of. The addition of authority files coming from Eastern Europe is going on, and it is a good point because their content is often rich. But the main stake is the capacity of VIAF to integrate institutions from the Eastern world: North Africa, the Near East and the Middle East, Asia. The lack of partners from Asia or South America is an important challenge to meet.

The initial core of VIAF thus considerably widened and the partners are now very diverse, both from the point of view of their status and of their geographical origin.

3. VIAF: how does it work?⁹

VIAF is based upon the relations that exist between a given bibliographic file and the authority file which pilots it. For a same entity (a person, a corporate body, etc.) the preferred form of the name in the authority record is transferred identically in the bibliographic records describing the resources on which this entity exercises an intellectual, artistic or commercial responsibility. In the bibliographic record, the preferred form can be accompanied with the identifier of the authority record it derives from. In a given catalogue, those relations can be specified thanks to hyperlinks that will allow the end-user to navigate from the authority file towards the bibliographic file and vice versa. VIAF relies both on bibliographic files and on authority files for the matching of the names of persons or the names of corporate bodies, and therefore every partner has to supply to OCLC those two types of data files.

Through every pair of records made of the association of one bibliographic record/one authority record, VIAF creates a derived authority record. Indeed, a few elements of data

⁹ Rick Bennet, Christina Hengel-Dittrich, Edward T. O'Neill, Barbara B Tillett *VIAF (Virtual International Authority File): Linking Die Deutsche Bibliothek and Library of Congress Name Authority Files*, 2006. <http://archive.ifla.org/IV/ifla72/papers/123-Bennett-en.pdf> (retrieved 1st June 2011)

belonging to the bibliographic record are additional elements of identification of the entity described in the related authority record. The following data are extracted (when exist) from every bibliographic record: title, names of all the contributors, name of the publisher, ISBN, type of the resource, language of the resource, place and date of publication, classification numbers, bibliographic record identifier, etc. This information is stored in the matching authority record, in 9XX MARC fields specifically defined for the needs of VIAF. The content of every field 9XX is normalized to facilitate the later treatments: for the textual data, all diacritics and punctuation signs are deleted and capital letters are replaced by lower case letters; years are transformed into decades (1963 becomes 196X), etc. In the end of the process we get « a derived authority record » containing the initial authority record (with its identifier) and fields 9XX containing the information extracted from the bibliographic record. For a given entity, this same process is applied to all bibliographic records linked to it in the partner bibliographic file, and the same process is repeated for every person or corporate body mentioned in a given bibliographic record, with the exception of the subject access points. In the end, we obtain a set of derived records for every entity and for every partner. These records are then merged in respect with their initial data file to finally create an enriched authority record for every partner. For every element of information derived from the bibliographic records, the number of occurrences in the partner data file is indicated in a subfield \$9.

The next step consists in the matching of the enriched authority records that were derived from every partner file, according to an algorithm conceived by the OCLC Research Service. Among other things, this algorithm relies on the occurrences found in the \$9 fields mentioned above. The result of a matching process is a cluster of enriched authority records: it is this node which carries the VIAF identifier. When displayed, the VIAF node contains:

- the VIAF identifier;
- all the preferred forms of the name of the person or of the corporate body, established by the partners. Every form is followed by the mention of the partners which established it (their nation flag is exposed). A graph also shows in a dynamic way how matches were made;
- all the variant forms of the name (the forms of exclusion “See”) used at least by one of the partners;
- all the related forms (the forms of orientation « See also ») used at least by one of the partners;
- the countries where the works of the person or the corporate body were published. A planisphere shows the global results.
- statistics showing the spread of time of the publications of an entity (that is either a person or a collectivity), easy to grasp thanks to a graphic view;
- the main publishers who released the works of the entity;
- the gender, the nationality, the language the most used by the entity;
- external links towards other resources such as WorldCat Identities or Wikipedia;
- links towards the representation of the VIAF record in UNIMARC, MARC21 XML and in RDF.

All the fields of a VIAF record are subject to a possible query. But it is also possible to narrow the search to a set of specified fields such as all names, corporate names, personal names, preferred names, exact names or work titles. In addition to this, it is also possible to further limit the search to the data of a single partner. From a VIAF record, one can visualize the enriched records of every partner from which the VIAF cluster was built. Only the data of the cluster can be downloaded, but RDF format records specially represent a promising future.

If needs be, a photography of the entire set of the VIAF records at a given moment, also called a «dump», can be supplied on request to the OCLC Research Service, to those who wish to integrate it in an application which must itself offer free access on the Web.

4. VIAF and the dialogue between cultures

Thanks to the nodes made between different authority files, it is possible to exceed the local cataloguing rules. These last ones depend largely on the cultural frames of every country. Of these cultural frames derive the national or regional rules for the construction of the names, and the choices of the preferred forms of the names, according to the public of every country, the language and the script used for the preferred forms, the calendar used to express the biographical dates, and, more generally speaking, the language used for cataloguing. Every national authority file is set up from the cultural frames of its own users, and those of the cataloguers who establish the records. VIAF allows going beyond national or regional particularities by making them interact with each other. To go beyond cultural usages does not mean to annihilate them. On the contrary, by refusing to establish a unique preferred form valid for all users, VIAF respects the initial cultural frames and then avoids establishing hierarchies between them. VIAF doesn't put itself on top of the original files but draws up bridges between them.

Forms of the name: national forms, international forms?

One of the demonstrations of this cultural pluralism is the variety of the cataloguing practices. It implies important differentiations in the choice and the structure of the preferred forms, and even the purposes of the initial authority files.

The example shown below for **Andrej Rublev**¹⁰, illustrates such a variety among the partners of the VIAF project: consider records from the BnF¹¹, the Library of Congress and the National Library of Israel. Each of these three institutions has different cataloguing practices, different formats and their catalogues are differently structured.

| | BnF authority record | LoC authority record | Israel NL (Russian Cyrillic file) |
|---|--|---|---|
| Format | Unimarc | MARC 21 | MARC 21 |
| Links between authority records and bibliographic records | Yes | No | Yes |
| Preferred forms | 3 preferred forms: Andreï Roublev (saint; 1360?-1430?) <i>French usual form</i> Andrej Rublev (saint; 1360?-1430?) <i>ISO international transliterated form-Russian</i> Андрей Рублев (saint; 1360?-1430?) <i>Russian international form</i> | A unique preferred form, transliterated according to the LoC system: Rublev, Andrej, Saint, d. ca. 1430 | A unique preferred form in Russian Cyrillic characters Рублев, Андрей, Святой, ум. ок. 1430 |
| Non Latin characters | One of the 3 preferred forms | Cross reference, thanks to automatic derivation | Preferred form |
| Biographical notes | In French | Mentioned in the source fields, in English | No notes |
| Sources | In Latin characters | In Latin characters | No sources |

We thus see that every country chooses as first preferred form, or unique preferred form, the one which fits best with its national practices. The BnF chose several preferred forms of equivalent status. Those are parallel forms. The first preferred form is the traditional form for France, most in compliance with the habits of the majority of end-users of the French institution catalogue. The two other preferred forms are Russian forms. They are given in the original script, here in Cyrillic, complying with ISO 9:1995. The parallel forms allow managing the multiplicity of possible uses of the data, plus the ones of the end-users. A student or a researcher in Art history will not use the same preferred form of the name as a specialist in Slavonic studies.

¹⁰ Icons Russian painter from the early 14th century

¹¹ <http://catalogue.bnf.fr/ark:/12148/cb11950441k>

The challenge of the multilinguism

The management of a wide scope of preferred forms of names established in libraries of different countries, according to standards and different cataloguing traditions legitimates the question of multilinguism. Today it is a core question for our library catalogues¹². The question of the multilinguism focuses on three main goals as expressed in the international code of cataloguing¹³. On the one hand, the question of the “*convenience of the user*”: “*Decisions taken in the making of descriptions and controlled forms of names for access should be made with the user in mind*”. Secondly, the principle of “*common usage*”: “*Vocabulary used in descriptions and access should correspond to the one used by the majority*”. Thirdly, the criterion of “*Representation*”: “*Descriptions and controlled forms of names should be based on the way an entity describes itself*”.

These various aspects start echoing with one of “the whereas” of the VIAF first cooperation agreement which is to “*allow national or regional variations in authorized form to coexist, thereby supporting worldwide users’ needs for variations in preferred language, script and spelling*”.

That is the reason why variations between cataloguing languages exist from one country to another. The qualifiers of function are expressed in different languages. The qualifier “saint” for Andrej Rublev is expressed in English in the Library of Congress Catalogue, in French in the BnF catalogue and in Russian (Святой) in the Cyrillic file of the National Library of Israel. The qualifiers of date can be introduced by various linguistic elements which may differ, depending on the country. The Library of Congress indicates in English “d. ca. 1430”; the Cyrillic file of the National Library of Israel underlines “*ум. ок. 1430*” (exact translation of “d. ca. 1430”). The BnF indicates uncertain dates with a question mark and no linguistic element added (“1430?”).

So we can see how VIAF allows connections between these multilingual data, without establishing a hierarchy between them.

The Challenge of the pluralism of scripts

To be completely handled, the question of the multilingualism has to include that of the pluralism of scripts. The Western national libraries, when they started their computerization, were not able to manage non-Latin characters. From then on, it is the transliterated form which served as original form of the name. Since, the BnF has gradually introduced non-Latin characters in the preferred forms of the names of its authority file. Then, the Library of Congress started to add non-Latin characters in its records, as variant form.

When VIAF integrated partners whose native catalogues were written with non-Latin characters, it shed a new light on the question. There is no reason for the Latin alphabet to occupy a prominent role in an international project, more than any other script. By using UNICODE for coding the characters, VIAF is then able to take into account a large number of scripts.

¹² See the plenary session of the Cataloguing Section, IFLA 2010 <http://www.ifla.org/en/conferences-sessions/216> (session 93) on the theme « Multilingual bibliographic access: promoting universal access”

¹³ Statement of International Cataloguing Principles retrieved 1st June 2011 from http://www.ifla.org/files/cataloguing/icp/icp_2009-en.pdf

4. The diversity of calendars

The qualifiers of date are essential in the authority files. To respect at best the cultural usages, VIAF must be capable of handling the pluralism of calendars which appear in the various authority files of the partner libraries.

To give an example, **Averroes** appears in most of the European and Anglo-Saxon libraries under its generally known form in the Western world, in accordance with the Christian era (Averroës, 1126-1198). However, in the Bibliotheca Alexandrina, it appears under the Arabic form of his name and with a qualifier of date built according to the calendar of the Hegira (ابن رشد، محمد بن أحمد، 595-520 هـ). The Arabic authority file of the National Library of Israel has chosen an Arabic form of the name more complete than the one of the Bibliotheca Alexandrina and gives dates according the Christian era in Arabic with Arabic numbers (ابن رشد، محمد بن احمد، ابو الوليد، ۱۱۲۶-۱۱۹۸ م). The matching algorithm used by VIAF allows that such a difference does not block the matching of the authority records, and consequently, takes into account the various eras currently used.

The VIAF matching process enables to go beyond the cataloguing choices due to cultural identities while respecting the latter ones, and this without introducing hierarchies among them. Better still, allowing such different data to interact with each other, VIAF emphasizes the values of every cataloguing tradition and beyond, the various manners names are assigned to individuals. So we have here a really important tool for highlighting the cultural diversity which appears in the various catalogues. It underlines the complementarity of data coming from different sources, produced according different cultural rules.

5. VIAF in the Semantic Web: a springboard between data

The use of the BnF authority data as a tool for the Semantic Web is inscribed in the project genesis. The initial cooperation agreement signed between the founding members of VIAF specifies that *“the current proposals for the future of the Web describe the use of ontologies for making the Web more intelligent for machine and automatic processing. VIAF could be one of the basic building blocks to “a Semantic Web” when combined with controlled vocabularies and authority files for such sources as abstracting and indexing services, archives, museums, publishers, etc. Libraries now have an opportunity to make a great contribution to this future and should help make this vision a reality”*.

The technologies of the Semantic Web

The VIAF records may be displayed and used in the RDF format (*Resource description framework*), which is the format used in the Semantic Web. The principle of RDF is to express one piece of information with triplets. For example: “Andrej Rublev is the subject of the film Andrej Rublev” or “the film Andrej Rublev was directed by Andrej Tarkovskij”. The technologies of the Semantic Web are founded on persistent identifiers assigned to resources (URI).

URI and RDF enable to elaborate a common language for the whole resources of the Semantic Web. It allows to establish links between them, for instance if we specify “Andrej Rublev described in the VIAF record under such persistent identifier is equivalent to Andrej Rublev described in Dbpedia under such persistent identifier”. VIAF can be used as a springboard towards other resources.

The uses of VIAF

The opportunities offered by the Semantic Web technologies allow the use of VIAF as an element of the authority control and of the identification of persons and corporate bodies in various projects. It is also possible to conceive VIAF as a gateway towards the various resources of the Semantic Web.

VIAF and the initialization of the ISNI international database

At the international level, within a few weeks, VIAF will serve to initiate the ISNI (International Standard Number Identifier) database. ISNI, as defined by the ISO standard 27729, identifies all the contributors to cultural goods – be they artists, creators, producers or publishers. The ISNI can be assigned to all the stakeholders which create, produce, manage, distribute or relate to a creative content, be they persons, legal entities (like organizations) or fictitious characters. In the ISNI database, the stakeholder is identified with its/his/her “public identity”, the name under which it is publicly known. The ISNI will then serve to identify the rightsholders in the digital world. It is a unique identification code for any stakeholder involved in various domains of the creation (music, cinema, visual arts, literature, etc.).

ISNI is conceived as a bridge between, on one hand, the different proprietary systems designed to identify the rightsholders, such as the Interested Party Identifiers (IPI) used by the CISAC¹⁴ members, or the International Performer Numbers (IPN) used by the IPDA¹⁵, and on the other hand the resource discovery tools such as VIAF. The data present in all these databases, among which those of VIAF, will be used to initiate the first version of the ISNI database. ISNI metadata will link the public identity to all the manifestations that are associated to it in the different systems, in order to allow the stakeholders to exchange information about the contributors implied, without disclosing confidential information. In a few weeks, the ISNI identifier should be added into the VIAF node, aside the VIAF identifier, and should be easily transferable into the authority files of the VIAF partners.

VIAF and the European project Europeana Regia

Europeana Regia is a project led by the European Commission which the purpose is to reconstitute in a virtual way collections of manuscripts that are today dispatched in different European libraries: the Carolingian manuscripts, the manuscripts of Charles V's library held in the Louvre museum, the manuscripts of the Aragone kings in Naples. All those documents are digitized. The formats of description used by the library partners are diverse (EAD, MARC, TEI). It was a necessity for a European project to allow a multilingual description and incite to use VIAF as an authority control repository for the names of the persons responsible for the works. In Europeana Regia, the languages of description are English, French, German, Spanish, Italian, Catalan and Dutch. Every author will be identified with his persistent identifier assigned to his record in the VIAF database. This identifier will be captured from the RDF representation of VIAF.

«Europeana Regia» is an example illustrating the possible use of VIAF for the management of a multilingual authority control.

¹⁴ Confédération Internationale des Sociétés d'Auteurs et Compositeurs

¹⁵ International Performers' Database Association

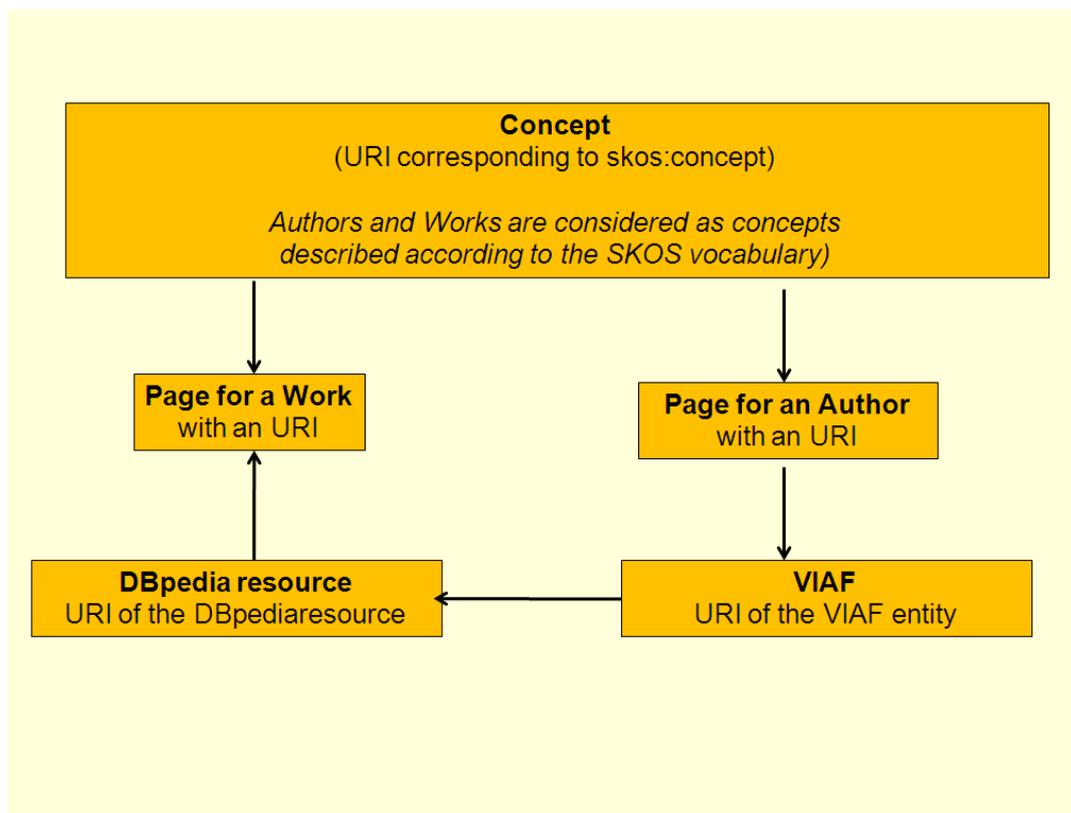
VIAF and a national project: the project *data.bnf.fr* of the Bibliothèque nationale de France

Data.bnf.fr is a BnF project, a prototype of which will be available online in Summer 2011. Its objective is to serve as a unique access point for the whole documentary resources of the institution, which are now dispatched in various databases (MARC bibliographic records, Archives and Manuscripts collections described according to the EAD format, the digital library “Gallica”, virtual exhibitions...) and to facilitate their top-ranking by the Internet search engines.

The principle is to create “pages for authors” that reuse the content of the authority file for Persons issued by the BnF, and similarly “pages for works” that reuse the content of the authority records established for Work Titles. These pages for “authors” and for “works” are enhanced with the description of the manifestations extracted from the bibliographical records describing resources listed in *BnF catalogue général* and in the manuscripts and archives collections.

Data.bnf.fr complies with the FRBR data model and the technologies of the Semantic Web, ruled in RDF.

Moreover, the project uses VIAF as a springboard towards other resources, like DBpedia, in the following way:



This « path » allows the integration of resources coming from DBpedia, in the “pages for authors” or in the “pages for works”, such as other forms of the name of a person or the title of a work, or possibly biographical data with a description of the work. It thus allows completing the existing data in the authority records of the BnF. *Data.bnf.fr* is an example of VIAF use as a springboard towards other resources.

These are just a few examples of VIAF possible uses. It remains that the most current use is the use made by cataloguers in their daily work to check and verify the authority records of the local catalogues. In 2010, there were a little more than 171 000 visits on the Web site and one million pages seen. For a more complete panorama of the possible uses, it would be necessary to question the current partners of VIAF about their motivations for contributing to the project, and beyond, those who showed their interest with the OCLC Research Service, asking for the authorization to re-use VIAF nodes data in their own applications.

Conclusion

VIAF offers the opportunity to build bridges between heterogeneous databases due to the cultural contexts in which they were elaborated, to their different architectures, and to the variety of their contents, by serving as a hub for accessing persons and corporate bodies. VIAF allows to pilot equally and without hierarchy, different languages and scripts data, respecting the initial cultural contexts of the persons and the corporate bodies, as well as the expectations of the end-users worldwide.

By comparing the data of the various authority files sources, VIAF contributes to strengthen them as it highlights the incoherencies which must be corrected in the source files, and beyond it increases their reliability. That way, the data of VIAF take a strong added value which is highly demanded in the Semantic Web where the notion of trust and reliability is essential.

The VIAF will be all the more reliable that the contributors and the end-users will increase in number.

Try VIAF and use it!