

Bridging the digital divide



CERN's Jean-Yves Le Meur, second from the right, teaching participants in Rwanda in 2009 how to install the digital library system on their computers

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Although digital libraries are spreading rapidly across the globe, many librarians and information technology (IT) engineers in Africa have not followed relevant training. This poses a real challenge. To help remedy the situation and encourage the development of digital libraries, the European Organization for Nuclear Research (CERN) and UNESCO have organized a series of training workshops over the past three years in Rwanda, Morocco and Senegal. These have been attended by librarians from more than 15 African countries. After each five-day school, 'champions' are selected for a one-month intensive course at CERN in Switzerland to broaden their knowledge.

The first CERN–UNESCO digital library school took place in 2009 in Rwanda. 'Many African countries are in the process of digitizing their libraries,' explains John Ellis, CERN's former coordinator for non-Member States. 'A workshop was organized in September 2009 by CERN in Rwanda to help familiarize librarians there with the library software we have at CERN, with the idea of deploying it and cloning it in these countries.'

UNESCO's Natural Sciences Sector and CERN's Scientific Information Service and Information Technology Department were able to provide librarians with face-to-face training in digital library software developed at CERN that is known as the Invenio platform.

A new repository for African theses

Jens Vigen, head of CERN's Scientific Information Service, was one of the organizers. 'African librarians are fully aware of the strengths of digital libraries and the importance of open-access publishing,' he says, 'but training and information

exchange is needed. The particle physics community is driving many of the developments in this field, so colleagues in university libraries are very keen to take advantage of our experience. The Invenio platform is open source, which corresponds with UNESCO's and CERN's goals of knowledge and technology transfer.' Rwanda was chosen for its strong IT profile.

Around 30 librarians and IT specialists participated in the five-day programme, which was divided into two main topics: the principles of open access, discussed by Vigen, and the more technical part, taught by Jean-Yves Le Meur from CERN's IT Department. Everyone learned how to install and parameterize the system. 'Our African colleagues have large collections of theses across all subjects,' says Vigen. 'These are currently held in digital form on compact disks. By adding these theses to their new repository, our African colleagues will be making this research visible worldwide.' He adds that 'they are also interested in including material from CERN, such as the Academic Training Lectures and the Yellow Reports¹².' The goal is to create a self-sustaining programme that can be handled at the local level.

Bridging the culture gap between IT engineer and librarian

The second digital software workshop took place at the National Centre for Scientific and Technical Research in Rabat (Morocco) in November 2010. It drew 30 librarians and IT engineers from Benin, Cameroon, Senegal, Tunisia and the host country. Annette Holtkamp, who is both a physicist and a librarian at CERN, was one of the instructors. 'It has become clear that what is obvious to an engineer is not obvious to a librarian and vice versa,' she observed. The workshops offer a unique opportunity for IT engineers and librarians to work together.

In Africa, it often happens that documents are inaccessible or cannot be found due to a lack of appropriate infrastructures. 'These workshops are an opportunity for the participants to analyse and compare their situation and to acquire knowledge that can help to offset these shortcomings,' explains Jérôme Caffaro, an IT engineer at CERN and another of the workshop's organizers. As in Rwanda, practical exercises in Morocco enabled the participants to come to grips with installing and maintaining library management software and the various processes for which it can be used.

'Invenio is able to manage large quantities of documents and the number of documents to be handled can only increase in Africa, as in the rest of the world,' observes Peter Amoako-Yirenyki, a former student who is currently professor of mathematics at Kwame Nkrumah University of Science and Technology in Ghana. Peter was on hand at the Morocco workshop to set up the software in conjunction with the team of specialists.

A portal grouping African university dissertations

The third workshop took place at the Université Cheikh Anta Diop in Dakar (Senegal) in November 2011. It attracted librarians and IT engineers from Burkina Faso, Côte d'Ivoire, Mali, Morocco and the host country.



Ludmila Marian from CERN assisting participants during a hands-on computer session in Dakar last year.

'We plan to use Invenio to build a portal for all African university dissertations to make them accessible to the global academic community,' explains Essaid Ait Allal, network and system administrator at the Moroccan Institute for Scientific and Technical Information. 'We need a system which can harvest data from various existing platforms then convert the bibliographic records and make them available at one central point.'

Guillaume Rewende Nikiema nods. He can identify with the need outlined by Essaid, working as he does for the African and Madagascan Council for Higher Education located in Burkina Faso, which also means bringing together library information from many different sources and platforms.

'Our interest is rather different,' says Fama Diagne Sene Ndiaye, chief librarian at the University of Bambey in Senegal. 'All the original documents from the French colonial administration of what are now eight independent African states, dating from 1895 to 1958, are in Senegal. Unfortunately, the papers are slowly deteriorating due to heat, moisture and simply the passing of time. So by learning more about Invenio, we are building up the expertise to digitize these unique historical records to preserve them and make them available to researchers not just in Africa but worldwide.'¹³

Tailor-made training

After each one-week school, some of the participants are invited to CERN in Switzerland to learn more about the Invenio platform. 'It is crucial to have these follow-up sessions, which are partly financed by UNESCO,' underlines Vigen. 'This way, we can enable in-depth training for selected participants in so-called "multiplier" positions. These are decision-makers and specialists in key institutions who can "multiply" and pass on the knowledge gained at CERN as part of their day-to-day work.'

The participants themselves appreciate the unique quality of this training at CERN. 'The advantage of being here is that we are sitting in offices right next to the people who develop the system and work with it every day,' explains Abdrahamane Anne from the University of Bamako in Mali. 'Whenever we hit a problem, Jens puts us in touch with the right person or arranges a workshop,' smiles Abdrahamane. 'That way, the training is truly tailor-made to our needs.'

'It is also an opportunity to share,' adds Eric Guedegbe from the United Nations African Institute for Economic Development and Planning. 'Sometimes, we ask the developers things they had not thought about before. We have also been able to participate in an international Invenio user group workshop. So being here has really allowed us to become active in the international Invenio community.'

A self-sustaining system

The series of digital library schools not only allows participants to put what they have learned into practice in their home institutions. It also enables them to pass on their expertise to others. Two of the teaching staff in Dakar were graduates from previous schools, a sign that the project is creating an independent capacity for further training without outside intervention from CERN.

A further benefit of the schools is the networking possibilities they offer. 'We encourage the participants to build their own international networks so that they become more and more



Five of the six 'champions' from the Morocco workshop in 2010 during their intensive course at CERN in May this year. From left to right: Essaid Ait Allal (Morocco), Guillaume Nikiema (Burkina Faso), Eric Guedegbe (Senegal), Fama Diagne Sene Ndiaye (Senegal), Abdrahmane Anne (Mali) and Jens Vigen (CERN). The sixth champion, Cécile Coulibaly (Côte d'Ivoire), is not pictured.

independent of support from CERN,' says Ludmila Marian from CERN's IT Department. The participants in the schools are active members of the Invenio mailing lists. 'African participants have already been able to respond to queries from other members of the Invenio community on the mailing list and make a really positive contribution,' observes Nikos Kasiousimis, also from CERN's IT Department.

Special ties

UNESCO and CERN enjoy special ties that go back more than half a century. CERN was created under the auspices of UNESCO back in 1954 (see box).

'The CERN-UNESCO Digital Library Schools programme offers CERN an opportunity to enter into contact with countries where we don't have any cooperation right now,' says Annette Holtkamp from the CERN library. 'We hope that this cooperation will then spread to the physics community.'

Subject to obtaining the necessary funding, the next school will hopefully take place in Ghana, which has just hosted the second African School on Fundamental Physics¹⁴ in July; this

major event was supported by CERN and UNESCO's Abdus Salam International Centre for Theoretical Physics, among others.

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¹² *This series communicates work related to a CERN activity that does not lend itself to publication in an academic journal.*

¹³ *See, for example, the academic repositories hosted by Ghana and Senegal: <http://library.kpoly.edu.gh>; www.unidep.org/library*

¹⁴ *See <http://africanschoolofphysics.web.cern.ch/africanschoolofphysics>*

¹⁵ *CERN science writers*

How CERN came into being

Today, few people remember that the creation of CERN was a UNESCO project. In the aftermath of the Second World War, men and women of the arts and sciences realized that scientific cooperation would be vital to rebuilding peace and security in Europe.

The project was initiated in June 1950 when UNESCO's General Conference in Florence (Italy) took up a US proposal for certain Allied countries and Axis powers which had fought on opposing sides during the war to establish a European Council for Nuclear Research (CERN). The project was refined in December that year, when it was decided to build a laboratory that would construct particle accelerators for research purposes.

In December 1951, an intergovernmental conference convened by UNESCO set up a Council of Representatives of States and several working groups to implement the project. At the second intergovernmental conference in February 1952, the interim agreement was finalized then came into force in May 1952. Within

five months, the provisional council had already chosen Geneva (Switzerland) as the site for the new laboratory.

In June 1953, the official CERN Convention was signed by the 12 founding Member States: Belgium, Denmark, Federal Republic of Germany, France, Greece, Italy, Netherlands, Norway, Sweden, Switzerland, UK and Yugoslavia. All had ratified the convention by 29 September 1954, now the official birthday of what has since been renamed the European Organization for Nuclear Research.

Today, CERN's membership stands at 20, with the addition of Austria (1959), Spain (1961-1969, rejoined in 1983), Portugal (1985), Finland and Poland (1991), Hungary (1992), the Czech and Slovak Republics (1993) and Bulgaria (1999), and the withdrawal of Yugoslavia in 1961. Israel and Serbia are Associate Members, an interim stage prior to full membership. India, Japan, the Russian Federation, Turkey and the USA enjoy Observer Status, as do the European Commission and UNESCO.